

Supporting Information

A benchmark database containing binary-system-high-quality-certified data for cross-comparing thermodynamic models and assessing their accuracy

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Table S1. List of the 107 pure compounds included in the proposed database with their corresponding *associating character* (NA, HA, HD or SA) and basic properties (T_c , P_c , ω , MW).

NA = Non-Associating, HA = Hydrogen-Acceptor, HD = Hydrogen-Donor, SA = Self-Associating.

Name	Associating character	T_c / K	P_c / bar	ω	MW / g mol^{-1}
1,2,3,4-TETRAHYDRONAPHTHALENE	NA	720.00	36.50	0.3353	132.20
1,2-DICHLOROETHANE	NA	561.60	53.70	0.2866	98.96
2,2,4-TRIMETHYLPENTANE	NA	543.80	25.70	0.3035	114.23
2,3,3,3-TETRAFLUOROPROPENE	NA	367.85	33.82	0.2820	114.04
ARGON	NA	150.86	48.98	0.0000	39.95
BENZENE	NA	562.05	48.95	0.2103	78.11
CARBON TETRACHLORIDE	NA	556.35	45.60	0.1926	153.82
CARBON TETRAFLUORIDE	NA	227.51	37.45	0.1790	88.00
CYCLOHEXANE	NA	553.80	40.80	0.2081	84.16
CYCLOPENTANE	NA	511.70	45.10	0.1949	70.13
DECAFLUOROBUTANE	NA	386.35	23.23	0.3664	238.03
DICHLORODIFLUOROMETHANE	NA	384.95	41.25	0.1797	120.91
ETHANE	NA	305.32	48.72	0.0995	30.07
ETHYL FLUORIDE	NA	375.31	50.28	0.2179	48.06
ETHYLENE	NA	282.34	50.41	0.0862	28.05
HEXAFLUROETHANE	NA	293.03	30.43	0.2549	138.01
ISOPENTANE	NA	460.40	33.80	0.2279	72.15
METHANE	NA	190.56	45.99	0.0115	16.04
METHYLCYCLOHEXANE	NA	572.10	34.80	0.2361	98.19
MONOCHLOROBENZENE	NA	632.35	45.19	0.2499	112.56
n-BUTANE	NA	425.12	37.96	0.2002	58.12
n-DECANE	NA	617.70	21.10	0.4923	142.28
n-DOTRIACONTANE	NA	855.00	7.50	1.3765	450.87
n-HEPTANE	NA	540.20	27.40	0.3495	100.20
n-HEXANE	NA	507.60	30.25	0.3013	86.18
n-HEXATRIACONTANE	NA	874.00	6.80	1.5260	506.97
NITROGEN	NA	126.20	34.00	0.0377	28.01
n-PENTANE	NA	469.70	33.70	0.2515	72.15
n-TETRACOSANE	NA	804.00	9.80	1.0710	338.65
OXYGEN	NA	154.58	50.43	0.0222	32.00
PROPANE	NA	369.83	42.48	0.1523	44.10
PROPYLENE	NA	364.85	46.00	0.1376	42.08
TOLUENE	NA	591.75	41.08	0.2640	92.14
XENON	NA	289.74	58.40	0.0000	131.29
1,2-EPOXYBUTANE	HA	526.00	43.90	0.2345	72.11
1,4-DIOXANE	HA	587.00	52.08	0.2793	88.11
3-PENTANONE	HA	560.95	37.40	0.3448	86.13
ACETONE	HA	508.20	47.01	0.3065	58.08
CARBON DIOXIDE	HA	304.21	73.83	0.2236	44.01
CARBON DISULFIDE	HA	552.00	79.00	0.1107	76.14
CARBON MONOXIDE	HA	132.92	34.99	0.0482	28.01
CYCLOPENTANONE	HA	624.50	46.00	0.2876	84.12
DIETHYL CARBONATE	HA	576.00	33.90	0.4857	118.13
DIETHYL ETHER	HA	466.70	36.40	0.2811	74.12
DIISOPROPYL ETHER	HA	500.05	28.80	0.3387	102.17
DIMETHYL CARBONATE	HA	548.00	45.00	0.3846	90.08
DIMETHYL ETHER	HA	400.10	53.70	0.2002	46.07
DI-n-BUTYL ETHER	HA	584.10	24.60	0.4476	130.23
DI-n-PROPYL ETHER	HA	530.60	30.28	0.3688	102.17
ETHYL ACETATE	HA	523.30	38.80	0.3664	88.11
HYDROGEN SULFIDE	HA	373.53	89.63	0.0942	34.08
METHYL ACETATE	HA	506.55	47.50	0.3313	74.08
METHYL ETHYL KETONE	HA	535.50	41.50	0.3234	72.11

METHYL tert-BUTYL ETHER	HA	497.10	32.86	0.2465	88.15
METHYL tert-PENTYL ETHER	HA	534.00	30.40	0.2981	102.17
N,N-DIMETHYLFORMAMIDE	HA	649.60	44.20	0.3177	73.09
n-BUTYL ACETATE	HA	575.40	30.90	0.4394	116.16
N-BUTYL ETHYL ETHER	HA	531.00	29.90	0.3854	102.17
N-METHYL-2-PYRROLIDONE	HA	721.60	45.20	0.3732	99.13
SULFOLANE	HA	853.00	50.30	0.3823	120.17
SULFUR DIOXIDE	HA	430.75	78.84	0.2454	64.06
TETRAHYDROFURAN	HA	540.15	51.90	0.2254	72.11
THIOPHENE	HA	579.35	56.90	0.1970	84.14
TRIETHYLAMINE	HA	535.15	30.40	0.3162	101.19
1,1,1,2,3,3,3-HEPTAFLUOROPROPANE	HD	374.83	29.12	0.3552	170.03
1,1,1,2-TETRAFLUROETHANE	HD	374.18	40.56	0.3269	102.03
1,1,1,3,3,3-HEXAFLUROPROPANE	HD	398.07	32.19	0.3905	152.04
1,1,1,3,3-PENTAFLUROBUTANE	HD	473.70	33.92	0.2571	148.08
1,1,1-TRIFLUOROETHANE	HD	345.88	37.64	0.2614	84.04
1,1,2,2-TETRACHLOROETHANE	HD	645.00	40.90	0.2467	167.85
1,1-DIFLUOROETHANE	HD	386.44	45.20	0.2751	66.05
1-HEPTYNE	HD	547.00	32.10	0.3778	96.17
1-HEXYNE	HD	516.20	36.20	0.3327	82.14
CHLORODIFLUOROMETHANE	HD	369.30	49.71	0.2192	86.47
CHLOROFORM	HD	536.40	54.72	0.2219	119.38
DICHLOROMETHANE	HD	510.00	60.80	0.1986	84.93
DIFLUOROMETHANE	HD	351.26	57.84	0.2771	52.02
HALOTHANE	HD	496.00	39.20	0.2750	197.38
PENTAFLUROETHANE	HD	339.17	36.20	0.3053	120.02
TRICHLOROETHYLENE	HD	571.00	49.10	0.2166	131.39
TRIFLUOROMETHANE	HD	299.01	48.16	0.2641	70.01
1-BUTANOL	SA	563.10	44.14	0.5883	74.12
1-PENTANOL	SA	588.10	38.97	0.5748	88.15
1-PROPANOL	SA	536.80	51.69	0.6209	60.10
2-BUTANOL	SA	535.90	41.89	0.5808	74.12
2-BUTOXYETHANOL	SA	633.90	32.70	0.5143	118.17
2-METHOXYETHANOL	SA	597.60	52.85	0.4543	76.09
2-METHYL-1-PROPANOL	SA	547.80	42.95	0.5857	74.12
2-METHYL-2-PROPANOL	SA	506.20	39.72	0.6152	74.12
3-METHYL-1-BUTANOL	SA	577.20	39.30	0.5900	88.15
ACETIC ACID	SA	591.95	57.86	0.4665	60.05
ACETONITRILE	SA	545.50	48.50	0.3419	41.05
ALLYL ALCOHOL	SA	545.10	56.20	0.5697	58.08
AMMONIA	SA	405.65	112.80	0.2526	17.03
DIETHYLAMINE	SA	496.60	37.10	0.3039	73.14
ETHANOL	SA	514.00	61.37	0.6436	46.07
ETHYL FORMATE	SA	508.40	47.40	0.2847	74.08
ETHYLENEDIAMINE	SA	593.00	62.90	0.4724	60.10
ISOPROPANOL	SA	508.30	47.65	0.6630	60.10
METHANOL	SA	512.50	80.84	0.5658	32.04
METHYL FORMATE	SA	487.20	60.00	0.2556	60.05
NITROMETHANE	SA	588.15	63.10	0.3480	61.04
n-PROPYL FORMATE	SA	538.00	40.20	0.3088	88.11
PHENOL	SA	694.25	61.30	0.4435	94.11
PROPYLENE GLYCOL MONOMETHYL ETHER	SA	579.80	41.13	0.4427	90.12
QUINOLINE	SA	782.15	48.60	0.3465	129.16
WATER	SA	647.10	220.64	0.3449	18.02

Table S2. The following 1079 pages analyse system-by-system the performances of the {Peng-Robinson equation of state with classical mixing rules and a T-dependent k_{ij} } to correlate the data included in the proposed database.

Such an analysis includes:

1. information on how the system deviates from ideality,
2. the values of the A and B fitted parameters,
3. the numerical values of the average deviations between experimental data and model correlation:
 - *MAPE on x*
 - *MAPE on y*
 - *MAPE on P_{LLV}*
 - *MAPE on z_{LLV}*
 - *MAPE on P_c*
 - *MAPE on x_c*
 - *MAPE on P_{az}*
 - *MAPE on x_{az}*
 - *MAPE on h^M*
 - *MAPE on c_p^M*
4. the so-called GPED (global phase equilibrium diagram) – calculated by the PR EoS – that makes it possible to immediately classify the binary system according to the scheme proposed by Van Konynenburg and Scott,
5. all the experimental data with the corresponding references,
6. all the deviations between experimental data and model correlation graphically illustrated by hundreds of figures. Explanations on “how to read the charts” are available on the next page.

How to read the charts

Global Phase Equilibrium Diagrams (GPED)

(P,T) plane

- **Red:** liquid-vapor critical point
 - Line (–): calculated LV critical line(s)
 - Symbol (*): experimental LV critical points
- **Purple line (–):** calculated liquid-liquid critical line
- **Blue:** three-phase equilibrium (VLLLE)
 - Line (–): calculated 3-phase line
 - Symbol (*): experimental VLLLE data
- **Green:** azeotropic point
 - Line (–): calculated azeotropic line
 - Symbol (*): experimental azeotropic point
- **Black line (–):** pure-component vaporization curve.
- **Black circles (○):** critical end-point(s).

(T,x₁,y₁) plane

- **Red:** liquid-vapor critical point
 - Line (–): calculated LV critical line
 - Symbol (*): experimental LV critical point
- **Purple line (–):** calculated liquid-liquid critical line
- **Blue, yellow and cyan:** three-phase equilibrium (VLLLE).
 - Lines (–, –, –): calculated 3-phase line (**L_α** in blue, **L_β** in yellow, **vapor** in cyan).
 - Symbol (*, *, *): experimental VLLLE data
- **Green:** azeotropic point
 - Line (–): calculated azeotropic line
 - Symbol (*): experimental azeotropic point
- **Black circles (○):** critical end-point.

Phase equilibrium and energetic properties diagrams

Isobaric (T,x₁,y₁) and isothermal (P,x₁,y₁) diagrams

- **Red:** dew curve (vapor phase / less dense phase)
 - Line (–): calculated
 - Symbol (*): experimental dew points
- **Blue:** bubble curve (liquid phase / denser phase)
 - Line (–): calculated
 - Symbol (+): experimental bubble points
- **Cyan:** three phase line
 - Line (–): calculated
 - Symbol (▲): experimental compositions (L_α, L_β, V)
- **Purple:** critical points (either vapor-liquid or liquid-liquid)
 - Line (–): a horizontal line identifies the calculated critical temperature (respectively critical pressure) in an isobaric (respectively isothermal) diagram.
 - Symbol (●): experimental critical point
- **Green:** azeotropic data
 - Line (–): a horizontal line identifies the calculated azeotropic temperature (respectively azeotropic pressure) in an isobaric (respectively isothermal) diagram.
 - Symbol (▲): experimental azeotropic point
- **Black square (□):** calculated pure-component-boiling temperature for isobaric diagram, calculated pure-component-vapor-pressure for isothermal diagrams

(h^M,z₁) and (c_P^M,z₁) diagrams

- **Line (–):** calculated curve (when data are available at the same T but at different P, they are plotted on the same diagram with different colors).
- **Symbol (x):** experimental data

METHANE (1) + ETHANE (2)

CAS	74-82-8	74-84-0
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	OTMSDBZUPAUEDD-UHFFFAOYSA-N
T_c / K	190.56	305.32
P_c / bar	45.99	48.72
ω	0.012	0.099

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 11.55$

$B/\text{MPa} = 15.00$

Deviations

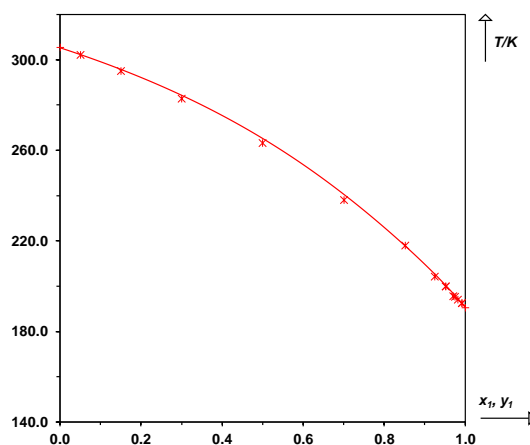
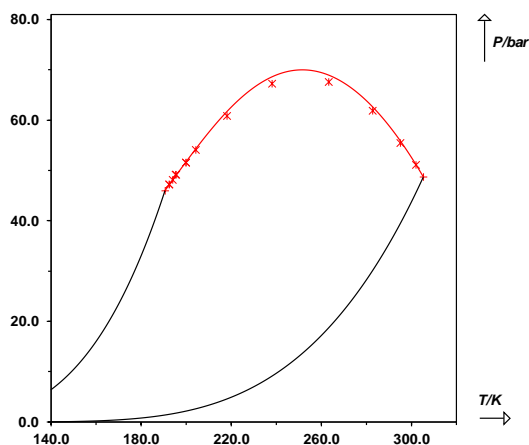
MAPE on $x = 2.7\%$

MAPE on $y = 2.4\%$

MAPE on $x_c = 4.1\%$

MAPE on $P_c = 0.71\%$

MAPE on $h^M = 37\%$



-----			42.20	0.9474	0.9832	
Isothermal phase equilibrium data			43.44	0.9646	0.9869	
-----			44.26	0.9749	0.9898	
Gomes de Azevedo, E.J.S. - Calado, J.C.G., Thermodynamics of liquid methane+ethane, Fluid Phase Equilibria. 49 (1989) 21-34. doi:10.1016/0378- 3812(89)80003-2			44.89	0.9819	0.9919	
T / K = 90.69			45.51	0.9882	0.9944	
P / bar	x ₁	y ₁	45.78	0.9916	0.9958	
0.0359	0.2144	0.9997	46.06	0.9938	0.9969	
0.0499	0.3194	0.9998	46.20	0.9956	0.9977	
0.0582	0.3901	0.9999	Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-ethane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 17 (1972) 9-12. doi:10.1021/je60052a022			
0.0649	0.4466	0.9999	T / K = 192.37			
0.0709	0.5106	0.9999	P / bar	x ₁	y ₁	
0.0795	0.6006	0.9999	2.689	0.0308	0.4339	
0.0900	0.7132	1.0000	4.240	0.0681	0.6358	
0.0992	0.8226	1.0000	6.895	0.1364	0.7755	
Miller, R.C. - Kidnay, A.J. - Hiza, M.J., Liquid + vapor equilibria in methane + ethene and in methane + ethane from 150.00 to 190.00 K, The Journal of Chemical Thermodynamics. 9 (1977) 167-178. doi:10.1016/0021- 9614(77)90082-9			11.03	0.2299	0.8605	
T / K = 160.00			17.24	0.3854	0.9087	
P / bar	x ₁	y ₁	24.13	0.5512	0.9372	
1.233	0.0602	0.8270	34.48	0.7885	0.9607	
2.026	0.1118	0.8970	41.37	0.9154	0.9755	
2.037	0.1127	0.8986	44.13	0.9529	0.9822	
3.050	0.1720	0.9344	45.64	0.9715	0.9862	
3.995	0.2225	0.9511	46.54	0.9813	0.9897	
4.116	0.2292	0.9534	47.02	0.9858	0.9910	
5.294	0.3035	0.9652	47.23	0.9912	0.9912	CRIT
5.984	0.3504	0.9704	Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-ethane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 17 (1972) 9-12. doi:10.1021/je60052a022			
7.930	0.4795	0.9794	T / K = 199.93			
9.930	0.6203	0.9854	P / bar	x ₁	y ₁	
11.95	0.7596	0.9909	3.103	0.0214	0.3005	
Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-ethane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 17 (1972) 9-12. doi:10.1021/je60052a022			4.482	0.0512	0.5098	
T / K = 190.87			6.895	0.1039	0.6800	
P / bar	x ₁	y ₁	11.03	0.1875	0.7957	
2.724	0.0340	0.4724	17.24	0.3100	0.8679	
4.171	0.0714	0.6513	24.13	0.4526	0.9052	
6.895	0.1386	0.7907	34.48	0.6601	0.9337	
11.03	0.2384	0.8709	41.37	0.7852	0.9461	
17.24	0.3955	0.9181	48.26	0.8942	0.9562	
24.13	0.5687	0.9425	49.57	0.9126	0.9584	
34.48	0.8150	0.9647	50.06	0.9175	0.9578	
38.82	0.9007	0.9750	50.47	0.9222	0.9575	
			51.02	0.9319	0.9577	
			51.57	0.9520	0.9520	CRIT

NA-NA systems (BAC = 1)

Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002

T / K = 210.00		
P / bar	x ₁	y ₁
9.660	0.1100	0.6411
10.91	0.1304	0.6807
16.10	0.2263	0.7782
20.55	0.2947	0.8244
26.51	0.3938	0.8574
38.26	0.5885	0.8990
43.82	0.6700	0.9101
46.56	0.7137	0.9134
48.41	0.7477	0.9162
51.82	0.7944	0.9170
53.30	0.8149	0.9177
53.78	0.8218	0.9179
55.82	0.8552	0.9151

Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002

T / K = 230.00		
P / bar	x ₁	y ₁
8.450	0.0186	0.1957
9.380	0.0315	0.2420
10.27	0.0417	0.2968
11.50	0.0571	0.3679
11.58	0.0585	0.3737
13.20	0.0787	0.4445
15.20	0.1045	0.5113
15.80	0.1110	0.5276
21.18	0.1785	0.6319
25.30	0.2324	0.6831
27.56	0.2573	0.7100
33.39	0.3294	0.7538
35.50	0.3574	0.7637
39.16	0.4002	0.7806
43.09	0.4480	0.7948
45.60	0.4790	0.8003
50.93	0.5392	0.8133
55.58	0.5962	0.8163
55.70	0.5994	0.8158
60.33	0.6543	0.8146
62.22	0.6813	0.8113

63.61	0.7017	0.8056
64.87	0.7341	0.7915
64.90	0.7231	0.8037

Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002

T / K = 250.00		
P / bar	x ₁	y ₁
15.63	0.0247	0.1489
18.81	0.0561	0.2734
28.49	0.1497	0.4911
40.83	0.2733	0.6125
48.98	0.3521	0.6550
59.51	0.4638	0.6795

Davalos, Juan - Anderson, Wayne R. - Phelps, Robert E. - Kidnay, Arthur J., Liquid-Vapor Equilibria at 250.00K for Systems Containing Methane, Ethane, and Carbon Dioxide, Journal of Chemical & Engineering Data. 21 (1976) 81-84. doi:10.1021/je60068a030

T / K = 250.00		
P / bar	x ₁	y ₁
15.30	0.0240	0.1340
22.29	0.0890	0.3650
22.80	0.0970	0.3830
32.93	0.1960	0.5400
45.60	0.3200	0.6430
55.93	0.4260	0.6730
66.57	0.5460	0.6730

Gupta, Mukesh K. - Gardner, Glenn C. - Hegarty, Michael J. - Kidnay, Arthur J., Liquid-vapor equilibriums for the N₂ + CH₄ + C₂H₆ system from 260 to 280 K, Journal of Chemical & Engineering Data. 25 (1980) 313-318. doi:10.1021/je60087a016

T / K = 260.00		
P / bar	x ₁	y ₁
18.04	0.0088	0.0467
19.68	0.0239	0.1150
21.89	0.0445	0.1922
23.53	0.0592	0.2387
25.60	0.0788	0.2924
30.38	0.1220	0.3810
35.15	0.1652	0.4483
41.13	0.2189	0.5052
50.97	0.3087	0.5664
55.91	0.3545	0.5823
60.19	0.3952	0.5896

63.48 0.4297 0.5897
66.04 0.4615 0.5823

Gupta, Mukesh K. - Gardner, Glenn C. - Hegarty, Michael J. - Kidnay, Arthur J., Liquid-vapor equilibriums for the N₂ + CH₄ + C₂H₆ system from 260 to 280 K, Journal of Chemical & Engineering Data. 25 (1980) 313-318. doi:10.1021/je60087a016

T / K = 270.00
P / bar x₁ y₁
22.83 0.0070 0.0298
24.21 0.0188 0.0762
26.45 0.0357 0.1332
31.10 0.0739 0.2361
35.54 0.1127 0.3140
40.53 0.1550 0.3768
45.90 0.1984 0.4237
49.71 0.2315 0.4484
50.93 0.2419 0.4558
61.02 0.3321 0.4889

Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002

T / K = 270.00
P / bar x₁ y₁
23.07 0.0080 0.0347
24.86 0.0235 0.0926
26.06 0.0330 0.1247
28.19 0.0498 0.1728
30.30 0.0682 0.2211
34.40 0.1031 0.2852
39.16 0.1443 0.3591
48.82 0.2256 0.4430
54.63 0.2763 0.4722
58.09 0.3088 0.4831
61.39 0.3516 0.4874
62.82 0.3684 0.4869
63.40 0.3751 0.4855
64.74 0.3922 0.4811

Gupta, Mukesh K. - Gardner, Glenn C. - Hegarty, Michael J. - Kidnay, Arthur J., Liquid-vapor equilibriums for the N₂ + CH₄ + C₂H₆ system from 260 to 280 K, Journal of Chemical & Engineering Data. 25 (1980) 313-318. doi:10.1021/je60087a016

T / K = 280.00
P / bar x₁ y₁
28.88 0.0081 0.0279

30.75 0.0231 0.0744
32.04 0.0335 0.1036
36.56 0.0693 0.1864
40.38 0.0996 0.2404
44.16 0.1292 0.2818
47.12 0.1528 0.3091
50.41 0.1798 0.3336
53.30 0.2044 0.3512
56.46 0.2333 0.3654
59.84 0.2668 0.3719
60.87 0.2774 0.3711
61.91 0.2913 0.3675
62.66 0.3046 0.3609
62.92 0.3109 0.3557

Isobaric phase equilibrium data

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 6.895
T / K y₁
184.26 0.8516
173.04 0.9250
158.59 0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 6.895
T / K x₁
188.26 0.1498
168.32 0.3002
154.71 0.5002
148.26 0.7000
144.54 0.8516
142.93 0.9250
141.82 0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

NA-NA systems (BAC = 1)

P / bar = 10.34

T / K	y ₁
240.59	0.0500
236.54	0.1498
230.43	0.3002
220.82	0.5002
207.04	0.7000
192.09	0.8516
179.48	0.9250
164.98	0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 10.34

T / K	x ₁
228.15	0.0500
203.87	0.1498
182.48	0.3002
166.04	0.5002
157.98	0.7000
153.71	0.8516
151.87	0.9250
150.32	0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 17.24

T / K	y ₁
258.21	0.0500
253.65	0.1498
246.37	0.3002
234.76	0.5002
219.21	0.7000
202.43	0.8516
188.87	0.9250
174.09	0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 17.24

T / K	x ₁
248.32	0.0500
226.37	0.1498
202.37	0.3002
183.09	0.5002
172.54	0.7000
167.09	0.8516
164.48	0.9250
162.76	0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 44.82

T / K	y ₁
297.32	0.0500
289.82	0.1498
279.21	0.3002
263.04	0.5002
242.26	0.7000
221.48	0.8516
206.37	0.9250
194.93	0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 44.82

T / K	x ₁
293.87	0.0500
277.54	0.1498
253.71	0.3002
226.82	0.5002
209.21	0.7000
200.09	0.8516
195.09	0.9250
191.65	0.9750

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 51.71

T / K	y ₁
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NA-NA systems (BAC = 1)

294.93	0.1498
283.54	0.3002
266.48	0.5002
244.98	0.7000
223.26	0.8516
207.59	0.9250

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 51.71

T / K	x ₁
286.98	0.1498
263.71	0.3002
235.76	0.5002
216.48	0.7000
206.54	0.8516
201.37	0.9250

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 58.61

T / K	y ₁
285.54	0.3002
268.76	0.5002
246.43	0.7000
223.32	0.8516

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 58.61

T / K	x ₁
273.54	0.3002
244.71	0.5002
223.76	0.7000
213.71	0.8516

Enthalpy of mixing

Miller, R. C. - Staveley, L. A. K., Excess Enthalpies for Some Binary Liquid Mixtures of Low-Molecular-Weight Alkanes, Advances in Cryogenic Engineering. (1960) 493-500.

T / K = 91.50

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
67.00	0.2825
80.00	0.4008
82.70	0.5105
84.90	0.6039
77.60	0.7044
65.80	0.7879

Miller, R. C. - Staveley, L. A. K., Excess Enthalpies for Some Binary Liquid Mixtures of Low-Molecular-Weight Alkanes, Advances in Cryogenic Engineering. (1960) 493-500.

T / K = 112.00

P / bar = UNKNOWN (2.0923)

h ^M / J.mol ⁻¹	x ₁
56.20	0.3020
64.10	0.3912
68.10	0.5136
66.30	0.6200
61.10	0.6841

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 266.70

P / bar = 1.013

h ^M / J.mol ⁻¹	z ₁
2.820	0.1750
3.710	0.2810
4.180	0.3770
4.500	0.4680
4.340	0.5490
3.730	0.6510
2.800	0.7860

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 282.20

P / bar = 1.013

h ^M / J.mol ⁻¹	z ₁
2.310	0.2110
3.210	0.3380
3.480	0.4360

3.590	0.4940
3.610	0.6420
2.430	0.7640
2.080	0.8410
1.150	0.8660

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, *The Journal of Chemical Thermodynamics*. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 298.20

P / bar = 1.013

$h^M / \text{J.mol}^{-1}$	z_1
1.750	0.1680
2.290	0.2450
2.760	0.3590
2.990	0.4340
3.230	0.5930
3.070	0.6420
2.710	0.7160
2.420	0.7320
1.540	0.8240

Critical point

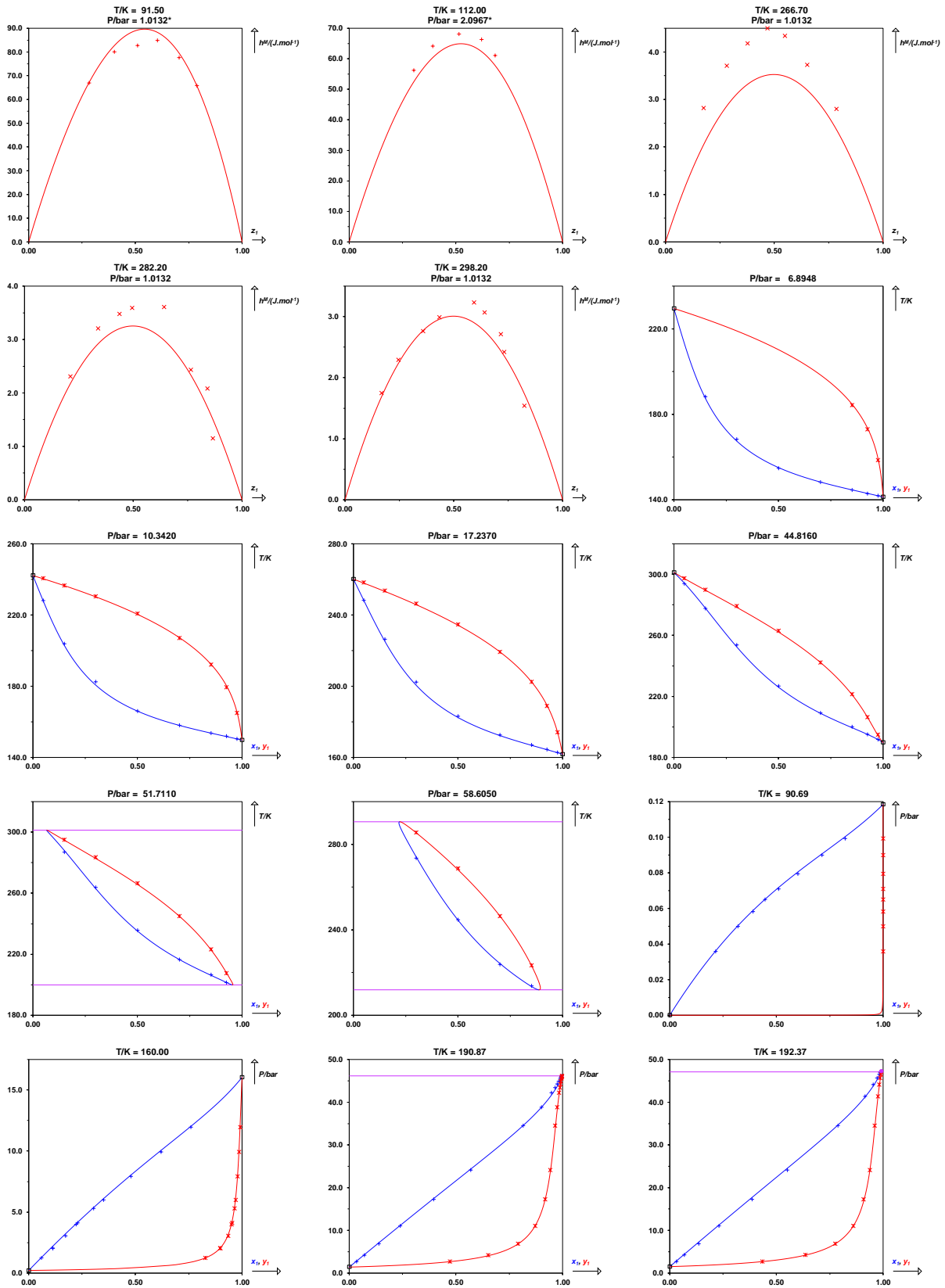
Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-ethane system at low temperatures and high pressures, *Journal of Chemical & Engineering Data*. 17 (1972) 9-12. doi:10.1021/jc60052a022

T / K	P / bar	x_1
192.39	47.22	0.9912
193.92	48.13	0.9821
195.44	49.14	0.9706
199.92	51.57	0.9520

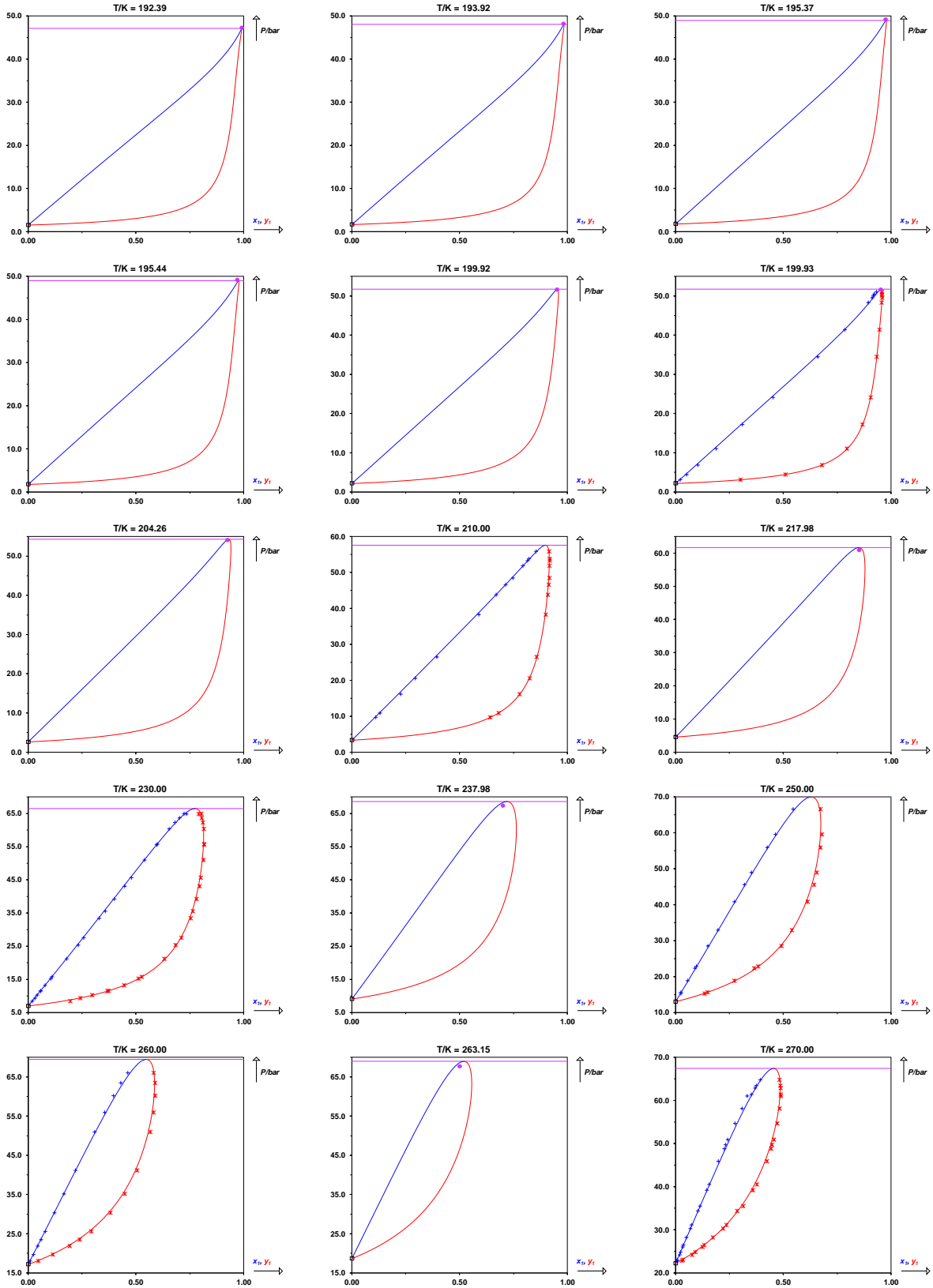
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibria in the binary systems of CH₄, C₂H₆, and N₂, *Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties*. 1 (1959) 180-194.

T / K	P / bar	x_1
195.37	49.16	0.9746
204.26	54.02	0.9250
217.98	60.88	0.8516
237.98	67.29	0.7000
263.15	67.64	0.5002
282.87	61.85	0.3002
294.98	55.50	0.1498
302.04	51.09	0.0500

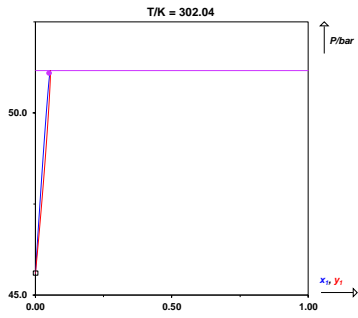
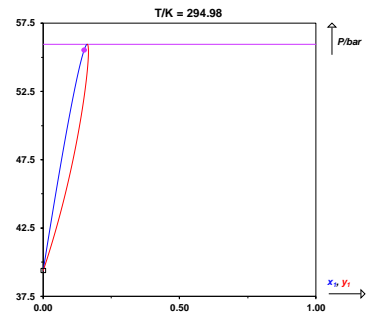
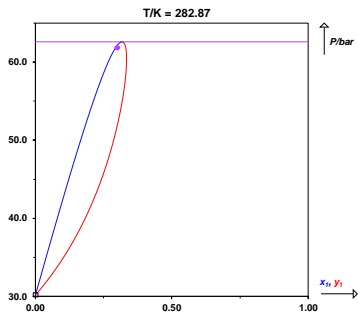
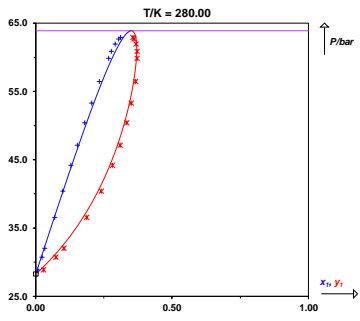
NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



METHANE (1) + PROPANE (2)

CAS	74-82-8	74-98-6
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	ATUOYW H BWRKTHZ-UHFFFAOYSA-N
T_c / K	190.56	369.83
P_c / bar	45.99	42.48
ω	0.012	0.152

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 22.88$

$B/\text{MPa} = 24.55$

Deviations

MAPE on $x = 4.2\%$

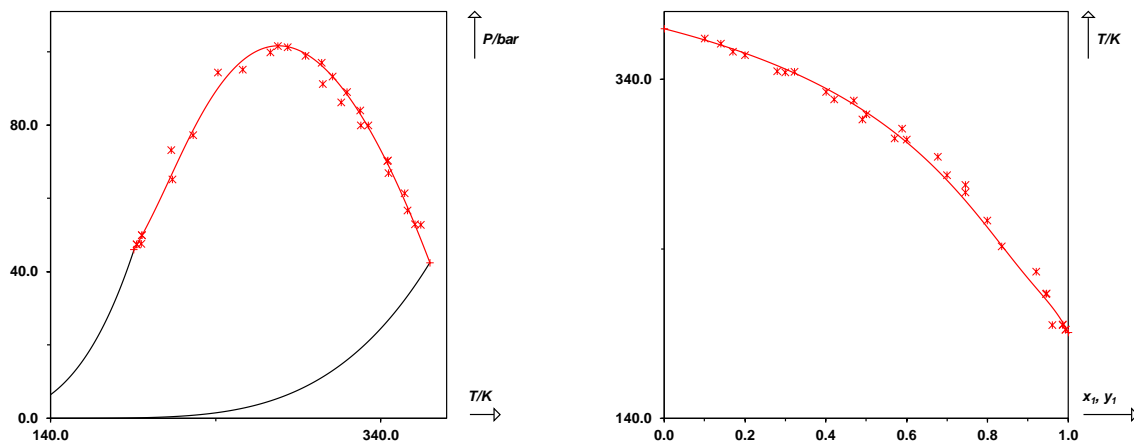
MAPE on $y = 5.9\%$

MAPE on $x_c = 9.2\%$

MAPE on $P_c = 2.2\%$

MAPE on $h^M = 35\%$

MAPE on $c_p^M = 119\%$



Isothermal phase equilibrium data

Poon, D. P. L. - Lu, B. C.-Y., Phase Equilibria for Systems Containing Nitrogen, Methane, and Propane, *Advances in Cryogenic Engineering*. (1995) 292-299.

T / K =	114.10	
P / bar	x ₁	y ₁
0.4206	0.1812	0.9990
0.5930	0.2911	0.9995
0.7722	0.4102	0.9997
0.9653	0.6647	0.9998

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, *Journal of Chemical & Engineering Data*. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K =	130.37	
P / bar	x ₁	y ₁
1.862	0.3924	0.9999
2.344	0.5007	0.9999
2.896	0.6982	1.0000

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, *Journal of Chemical & Engineering Data*. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K =	144.26	
P / bar	x ₁	y ₁
2.137	0.2109	0.9994
3.310	0.3005	0.9996
5.102	0.5258	0.9998
6.274	0.7200	0.9999
6.757	0.8306	0.9999
7.446	0.9287	1.0000

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, *Journal of Chemical & Engineering Data*. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K =	158.15	
P / bar	x ₁	y ₁
1.724	0.0873	0.9958
3.551	0.1791	0.9979
6.895	0.3510	0.9989
9.549	0.5450	0.9992
12.14	0.8000	0.9996
12.89	0.8738	0.9997
13.38	0.9135	0.9997
13.89	0.9497	0.9998

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, *Journal of Chemical & Engineering Data*. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K =	172.04	
P / bar	x ₁	y ₁
2.124	0.0692	0.9862
3.627	0.1196	0.9915
6.895	0.2270	0.9950
13.79	0.4909	0.9973
17.93	0.6907	0.9979
20.69	0.8423	0.9984
22.06	0.9032	0.9988
23.58	0.9650	0.9992

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, *Journal of Chemical & Engineering Data*. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K =	187.43	
P / bar	x ₁	y ₁
2.827	0.0629	0.9656
6.895	0.1506	0.9839
13.79	0.3042	0.9907
20.69	0.4769	0.9929
27.58	0.6728	0.9937
33.78	0.8450	0.9947
37.23	0.9230	0.9958
38.96	0.9623	0.9968
40.40	0.9810	0.9980

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, *Journal of Chemical & Engineering Data*. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K =	192.26	
P / bar	x ₁	y ₁
2.068	0.0409	0.9355
3.447	0.0692	0.9601
5.171	0.1052	0.9718
6.895	0.1379	0.9783
13.79	0.2737	0.9874
20.68	0.4207	0.9899
27.58	0.5819	0.9913
34.47	0.7529	0.9919
39.65	0.8728	0.9924
44.06	0.9578	0.9941
45.92	0.9782	0.9953
46.47	0.9844	0.9957
47.47	0.9926	0.9926

CRIT

NA-NA systems (BAC = 1)

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K = 195.15		
P / bar	x ₁	y ₁
2.103	0.0377	0.9244
3.620	0.0667	0.9541
5.171	0.0958	0.9670
6.826	0.1263	0.9742
13.79	0.2545	0.9845
20.69	0.3969	0.9882
27.58	0.5392	0.9898
34.48	0.6947	0.9904
44.82	0.9061	0.9908
47.44	0.9546	0.9912
48.82	0.9719	0.9911
49.92	0.9856	0.9856

CRIT

Price, A. R. - Kobayashi, Riki, Low Temperature Vapor-Liquid Equilibrium in Light Hydrocarbon Mixtures: Methane-Ethane-Propane System., Journal of Chemical & Engineering Data. 4 (1959) 40-52. doi:10.1021/je60001a007

T / K = 199.82		
P / bar	x ₁	y ₁
6.895	0.1250	0.9591
7.929	0.1440	0.9700
13.79	0.2220	0.9792
14.82	0.2500	0.9810
41.37	0.7440	0.9852
42.40	0.7720	0.9842
51.71	0.9396	0.9851
52.75	0.9533	0.9854

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-ethane-propane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 17 (1972) 13-18. doi:10.1021/je60052a017

T / K = 199.82		
P / bar	x ₁	y ₁
2.758	0.0427	0.9197
6.895	0.1149	0.9652
13.79	0.2335	0.9807
27.58	0.4937	0.9874
41.37	0.7472	0.9863
49.99	0.8979	0.9879

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K = 213.71		
P / bar	x ₁	y ₁
1.896	0.0205	0.7669
3.551	0.0443	0.8706
6.895	0.0899	0.9288
10.34	0.1358	0.9505
20.68	0.2709	0.9698
27.58	0.3656	0.9741
34.47	0.4580	0.9760
41.37	0.5563	0.9767
48.26	0.6555	0.9755
55.16	0.7573	0.9726
62.05	0.8600	0.9646
64.74	0.9053	0.9519
65.10	0.9469	0.9469

CRIT

Webster, Leigh A. - Kidnay, Arthur J., Vapor-Liquid Equilibria for the Methane-Propane-Carbon Dioxide Systems at 230 K and 270 K, Journal of Chemical & Engineering Data. 46 (2001) 759-764. doi:10.1021/je000307d

T / K = 230.00		
P / bar	x ₁	y ₁
6.970	0.0657	0.8563
8.020	0.0759	0.8717
8.650	0.0855	0.8782
9.970	0.0994	0.8925
12.34	0.1244	0.9134
13.53	0.1372	0.9180
14.93	0.1524	0.9238
18.95	0.1972	0.9368
20.20	0.2128	0.9390
21.74	0.2269	0.9408
23.01	0.2436	0.9419
24.66	0.2550	0.9466
26.72	0.2758	0.9485
27.92	0.2864	0.9499
29.69	0.3178	0.9497
33.82	0.3526	0.9538
35.37	0.3738	0.9532
39.71	0.4126	0.9556
40.00	0.4179	0.9558
41.74	0.4337	0.9515
43.99	0.4614	0.9546
45.75	0.4727	0.9531
50.57	0.5291	0.9537
55.13	0.5738	0.9524
60.50	0.6313	0.9495
65.66	0.6849	0.9448
69.46	0.7222	0.9407

NA-NA systems (BAC = 1)

70.00	0.7298	0.9415		Webster, Leigh A. - Kidnay, Arthur J., Vapor-Liquid Equilibria for the Methane-Propane-Carbon Dioxide Systems at 230 K and 270 K, Journal of Chemical & Engineering Data. 46 (2001) 759-764. doi:10.1021/je000307d
71.25	0.7468	0.9369		
72.70	0.7590	0.9334		
74.22	0.7833	0.9279		
76.21	0.8067	0.9214		
77.20	0.8255	0.9175		
77.67	0.8398	0.9155		
Akers, W. W. - Burns, J. F. - Fairchild, W. R., Low-Temperature Phase Equilibria: Methane-Propane System, Industrial & Engineering Chemistry. 46 (1954) 2531-2534. doi:10.1021/ie50540a038				
T / K = 241.48				
P / bar	x ₁	y ₁		
6.895	0.0500	0.7650		
13.79	0.1120	0.8680		
20.68	0.1750	0.9020		
27.58	0.2370	0.9200		
34.47	0.3000	0.9300		
41.37	0.3610	0.9330		
48.26	0.4220	0.9360		
55.16	0.4850	0.9350		
62.05	0.5480	0.9330		
68.95	0.6090	0.9300		
75.84	0.6710	0.9190		
82.74	0.7340	0.9010		
89.63	0.7960	0.8720		
94.40	0.8350	0.8350	CRIT	
Akers, W. W. - Burns, J. F. - Fairchild, W. R., Low-Temperature Phase Equilibria: Methane-Propane System, Industrial & Engineering Chemistry. 46 (1954) 2531-2534. doi:10.1021/ie50540a038				
T / K = 256.48				
P / bar	x ₁	y ₁		
6.895	0.0340	0.5600		
13.79	0.0890	0.7670		
20.68	0.1420	0.8320		
27.58	0.1970	0.8610		
34.47	0.2490	0.8800		
41.37	0.3030	0.8880		
48.26	0.3570	0.8900		
55.16	0.4100	0.8920		
62.05	0.4640	0.8910		
68.95	0.5180	0.8890		
75.84	0.5720	0.8820		
82.74	0.6360	0.8690		
89.63	0.7180	0.8450		
95.10	0.8000	0.8000	CRIT	
Webster, Leigh A. - Kidnay, Arthur J., Vapor-Liquid Equilibria for the Methane-Propane-Carbon Dioxide Systems at 230 K and 270 K, Journal of Chemical & Engineering Data. 46 (2001) 759-764. doi:10.1021/je000307d				
T / K = 270.00				
P / bar	x ₁	y ₁		
7.540	0.0238	0.4184		
8.120	0.0296	0.4536		
9.040	0.0356	0.5003		
9.310	0.0385	0.5119		
10.73	0.0474	0.5752		
11.89	0.0588	0.6089		
13.31	0.0667	0.6526		
14.34	0.0748	0.6670		
15.35	0.0779	0.6874		
15.44	0.0827	0.6881		
16.94	0.0928	0.7160		
18.25	0.1015	0.7269		
19.17	0.1040	0.7416		
19.56	0.1146	0.7418		
21.70	0.1281	0.7608		
23.44	0.1397	0.7713		
25.63	0.1542	0.7859		
26.63	0.1638	0.7919		
27.98	0.1718	0.7969		
28.57	0.1789	0.7998		
30.31	0.1901	0.8073		
30.53	0.1903	0.8083		
34.07	0.2160	0.8211		
38.73	0.2493	0.8345		
47.02	0.3064	0.8468		
55.02	0.3601	0.8543		
53.80	0.3612	0.8467		
58.27	0.3825	0.8520		
58.38	0.3848	0.8518		
65.46	0.4314	0.8553		
66.87	0.4374	0.8546		
70.34	0.4655	0.8539		
75.49	0.5012	0.8494		
80.00	0.5345	0.8426		
84.13	0.5642	0.8356		
92.22	0.6429	0.8029		
92.92	0.6543	0.7937		
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane-Propane System., Industrial & Engineering Chemistry. 42 (1950) 534-539. doi:10.1021/ie50483a037				
T / K = 277.59				

NA-NA systems (BAC = 1)

P / bar	x ₁	y ₁				
6.895	0.0099	0.2034		58.61	0.3042	0.7403
10.34	0.0324	0.4432		62.05	0.3261	0.7442
13.79	0.0549	0.5627		65.50	0.3481	0.7471
17.24	0.0779	0.6382		68.95	0.3707	0.7497
20.69	0.1008	0.6875		72.40	0.3938	0.7520
24.13	0.1242	0.7235		75.84	0.4179	0.7539
27.58	0.1471	0.7505		79.29	0.4425	0.7553
31.03	0.1695	0.7677		82.74	0.4679	0.7567
34.48	0.1923	0.7819		86.19	0.4954	0.7570
37.92	0.2171	0.7966		89.63	0.5244	0.7561
41.37	0.2378	0.8042		93.08	0.5670	0.7503
44.82	0.2607	0.8099		96.53	0.6046	0.7309
48.26	0.2834	0.8135		98.87	0.6772	0.6772 CRIT
51.71	0.3060	0.8159		Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane-Propane System., Industrial & Engineering Chemistry. 42 (1950) 534-539. doi:10.1021/ie50483a037		
55.16	0.3289	0.8180		T / K = 310.93		
58.61	0.3517	0.8188		P / bar	x ₁	y ₁
62.05	0.3769	0.8199		13.79	0.0049	0.0521
65.50	0.3986	0.8205		17.24	0.0257	0.2184
68.95	0.4226	0.8208		20.69	0.0460	0.3255
72.40	0.4473	0.8211		24.13	0.0652	0.3949
75.84	0.4719	0.8214		27.58	0.0845	0.4472
79.29	0.4968	0.8217		31.03	0.1040	0.4884
82.74	0.5225	0.8220		34.48	0.1235	0.5209
86.19	0.5471	0.8217		37.92	0.1432	0.5481
89.63	0.5719	0.8217		41.37	0.1630	0.5714
93.08	0.5967	0.8217		44.82	0.1821	0.5911
96.53	0.6215	0.8217		48.26	0.2019	0.6073
99.97	0.6463	0.8217		51.71	0.2216	0.6210
101.63	0.6711	0.8217	CRIT	55.16	0.2418	0.6321
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane-Propane System., Industrial & Engineering Chemistry. 42 (1950) 534-539. doi:10.1021/ie50483a037				58.61	0.2611	0.6420
T / K = 294.26				62.05	0.2836	0.6503
P / bar	x ₁	y ₁		65.50	0.3051	0.6572
10.34	0.0106	0.1513		68.95	0.3271	0.6635
13.79	0.0321	0.3435		72.40	0.3498	0.6691
17.24	0.0535	0.4750		75.84	0.3731	0.6738
20.69	0.0749	0.5338		79.29	0.3969	0.6767
24.13	0.0959	0.5853		82.74	0.4226	0.6779
27.58	0.1168	0.6231		86.19	0.4511	0.6766
31.03	0.1372	0.6501		89.63	0.4889	0.6643
34.48	0.1580	0.6721		93.08	0.5610	0.6087
37.92	0.1782	0.6908		93.29	0.5882	0.5882 CRIT
41.37	0.1987	0.7038		Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane-Propane System., Industrial &		
44.82	0.2196	0.7141		of the Methane-Propane System., Industrial &		
48.26	0.2407	0.7228		Engineering Chemistry. 42 (1950) 534-539. doi:10.1021/ie50483a037		
51.71	0.2616	0.7300		T / K = 310.93		
55.16	0.2828	0.7357		P / bar	x ₁	y ₁

NA-NA systems (BAC = 1)

Engineering Chemistry. 42 (1950) 534-539.
doi:10.1021/ie50483a037

T / K = 327.59

P / bar	x ₁	y ₁	
20.69	0.0104	0.0699	
24.13	0.0289	0.1663	
27.58	0.0480	0.2414	
31.03	0.0664	0.2964	
34.48	0.0852	0.3418	
37.92	0.1040	0.3797	
41.37	0.1227	0.4109	
44.82	0.1419	0.4361	
48.26	0.1612	0.4582	
51.71	0.1810	0.4768	
55.16	0.2008	0.4938	
58.61	0.2213	0.5086	
62.05	0.2430	0.5224	
65.50	0.2652	0.5351	
68.95	0.2885	0.5459	
72.40	0.3118	0.5532	
75.84	0.3361	0.5546	
79.29	0.3654	0.5473	
82.74	0.4101	0.5130	
83.98	0.4691	0.4691	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane-Propane System., Industrial & Engineering Chemistry. 42 (1950) 534-539.
doi:10.1021/ie50483a037

T / K = 344.26

P / bar	x ₁	y ₁	
27.58	0.0063	0.0276	
31.03	0.0249	0.0981	
34.48	0.0433	0.1550	
37.92	0.0622	0.2007	
41.37	0.0813	0.2392	
44.82	0.1002	0.2712	
48.26	0.1199	0.2983	
51.71	0.1402	0.3215	
55.16	0.1618	0.3414	
58.61	0.1820	0.3566	
62.05	0.2081	0.3656	
65.50	0.2375	0.3678	
68.95	0.2800	0.3558	
70.33	0.3228	0.3228	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane-Propane System., Industrial &

Engineering Chemistry. 42 (1950) 534-539.
doi:10.1021/ie50483a037

T / K = 360.93

P / bar	x ₁	y ₁	
37.92	0.0107	0.0280	
41.37	0.0333	0.0798	
44.82	0.0555	0.1208	
48.26	0.0786	0.1489	
49.99	0.0926	0.1570	
51.71	0.1120	0.1601	
52.88	0.1400	0.1400	CRIT

Isobaric phase equilibrium data

Watanabe, Kazuo - Kuroki, Masaaki - Ogura, Masao - Saito, Isao, Vapour-Liquid-Equilibrium of LNG, TEION KOGAKU (Journal of Cryogenics and Superconductivity Society of Japan). 4 (1969) 292-301.
doi:10.2221/jcsj.4.292

P / bar = 1.013

T / K	x ₁	y ₁
223.15	0.0074	0.8142
213.15	0.0147	0.9144
203.15	0.0201	0.9380
193.15	0.0298	0.9533
183.15	0.0311	0.9656
173.15	0.0465	0.9778
163.15	0.0587	0.9879
153.15	0.0853	0.9948
143.15	0.1158	0.9983

Enthalpy of mixing

Miller, R. C. - Staveley, L. A. K., Excess Enthalpies for Some Binary Liquid Mixtures of Low-Molecular-Weight Alkanes, Advances in Cryogenic Engineering. (1960) 493-500.

T / K = 91.50

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
118.30	0.3053
137.50	0.3798
154.80	0.5013
155.30	0.5871
143.70	0.6889

Cutler, A. J. B. - Morrison, J. A., Excess thermodynamic functions for liquid mixtures of methane + propane, Transactions of the Faraday Society. 61 (1965)
doi:10.1039/tf9656100429

T / K = 100.00

NA-NA systems (BAC = 1)

P / bar =	UNKNOWN (1.0132)	23.20	0.5100
$h^M / \text{J.mol}^{-1}$	x_1	22.90	0.5790
29.31	0.1000	22.60	0.6100
54.43	0.2000	21.60	0.6620
79.55	0.3000	18.40	0.7400
100.48	0.4000		
113.04	0.5000		
121.42	0.6000		
113.04	0.7000		
83.74	0.8000		
25.12	0.9000		
Miller, R. C. - Staveley, L. A. K., Excess Enthalpies for Some Binary Liquid Mixtures of Low-Molecular-Weight Alkanes, Advances in Cryogenic Engineering. (1960) 493-500.			
T / K =	112.00	T / K =	263.60
P / bar =	UNKNOWN (1.0132)	P / bar =	1.013
$h^M / \text{J.mol}^{-1}$	x_1	$h^M / \text{J.mol}^{-1}$	z_1
97.40	0.3019	12.40	0.2030
119.70	0.4017	18.50	0.3610
128.30	0.5048	19.50	0.4190
128.40	0.6160	20.40	0.4860
120.60	0.7022	20.60	0.5370
85.70	0.8274	20.30	0.5910
		18.90	0.6420
		16.50	0.7030
		12.00	0.7970
Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7			
T / K =	243.20	T / K =	273.20
P / bar =	1.013	P / bar =	1.013
$h^M / \text{J.mol}^{-1}$	z_1	$h^M / \text{J.mol}^{-1}$	z_1
20.00	0.2680	10.90	0.1920
25.40	0.3910	15.30	0.2990
27.40	0.4640	18.30	0.4250
27.50	0.5270	18.70	0.4960
25.30	0.5990	17.70	0.6060
22.40	0.6780	16.90	0.6510
		15.30	0.7170
		11.10	0.7870
		10.90	0.8030
		7.200	0.8830
Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7			
T / K =	253.20	T / K =	281.20
P / bar =	1.013	P / bar =	1.013
$h^M / \text{J.mol}^{-1}$	z_1	$h^M / \text{J.mol}^{-1}$	z_1
19.10	0.2800	14.80	0.3590
22.70	0.4000		
22.90	0.4670		

16.50	0.4100	P / bar =	UNKNOWN (1.0132)
16.30	0.5620	$c_p^M / J.mol^{-1}.K^{-1}$	x_1
16.10	0.5900	-0.6276	0.1000
13.10	0.7360	-0.8786	0.2000

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 290.70

P / bar = 1.013

$h^M / J.mol^{-1}$ z_1

8.300 0.1550

9.700 0.2010

13.40 0.3440

13.80 0.3520

14.70 0.4190

15.20 0.5000

14.10 0.6190

12.50 0.6930

11.40 0.7080

10.70 0.7500

10.00 0.7530

9.100 0.7920

5.100 0.8920

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 302.20

P / bar = 1.013

$h^M / J.mol^{-1}$ z_1

12.90 0.3590

13.30 0.4250

13.70 0.5040

13.40 0.5390

13.30 0.6070

12.10 0.6640

10.40 0.7300

6.300 0.8440

Heat capacity of mixing

Cutler, A. J. B. - Morrison, J. A., Excess thermodynamic functions for liquid mixtures of methane + propane, Transactions of the Faraday Society. 61 (1965) doi:10.1039/tf9656100429

T / K = 100.00

P / bar =	UNKNOWN (1.0132)
$c_p^M / J.mol^{-1}.K^{-1}$	x_1
-0.6276	0.1000
-0.8786	0.2000
-0.9205	0.3000
-0.7531	0.4000
-0.4602	0.5000
-0.1255	0.6000
0.1255	0.7000
0.2929	0.8000
0.2929	0.9000

Critical point

Wichterle, Ivan - Kobayashi, Riki, Vapor-liquid equilibrium of methane-propane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 17 (1972) 4-9. doi:10.1021/je60052a019

T / K	P / bar	x_1
192.30	47.47	0.9926
195.20	49.90	0.9856

Akers, W. W. - Burns, J. F. - Fairchild, W. R., Low-Temperature Phase Equilibria: Methane-Propane System, Industrial & Engineering Chemistry. 46 (1954) 2531-2534. doi:10.1021/ie50540a038

T / K	P / bar	x_1
194.82	47.60	0.9600
213.15	73.10	0.9450
226.48	77.20	0.9210
273.15	99.90	0.7450

Sage, Bruce H. - Lacey, William N. - Schaafsma, Jan G., Phase Equilibria in Hydrocarbon Systems II. Methane-Propane System, Industrial & Engineering Chemistry. 26 (1934) 214-217. doi:10.1021/ie50290a020

T / K	P / bar	x_1
283.55	101.22	0.7000
304.25	96.97	0.6000
319.45	89.07	0.5000
332.45	79.84	0.4000
344.05	70.22	0.3000
354.35	61.40	0.2000
364.15	52.79	0.1000

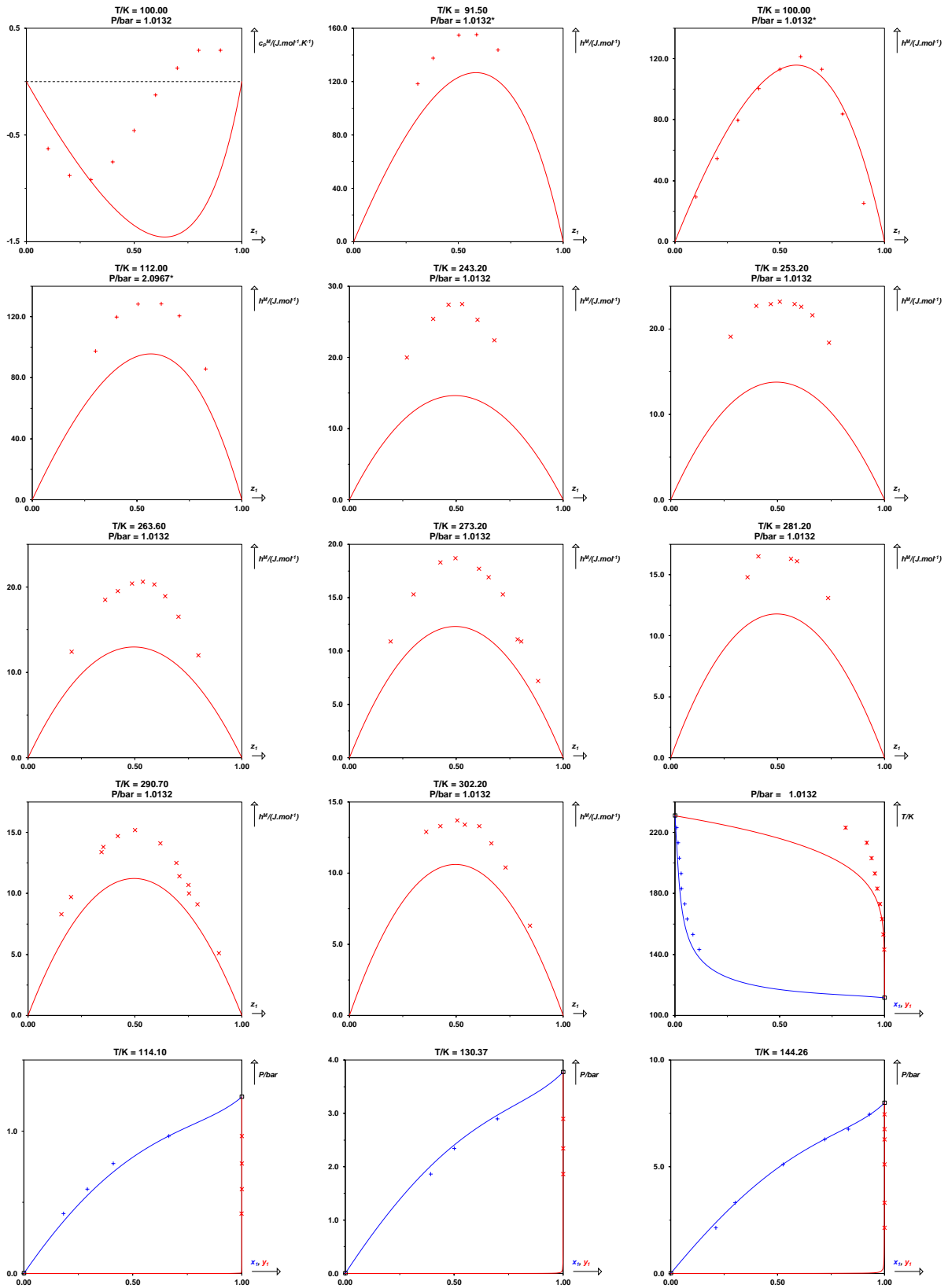
Roof, J. G. - Baron, J. D., Critical loci of binary mixtures of propane with methane, carbon dioxide, and nitrogen, Journal of Chemical & Engineering Data. 12 (1967) 292-293. doi:10.1021/je60034a003

T / K	P / bar	x_1
304.98	91.22	0.5700

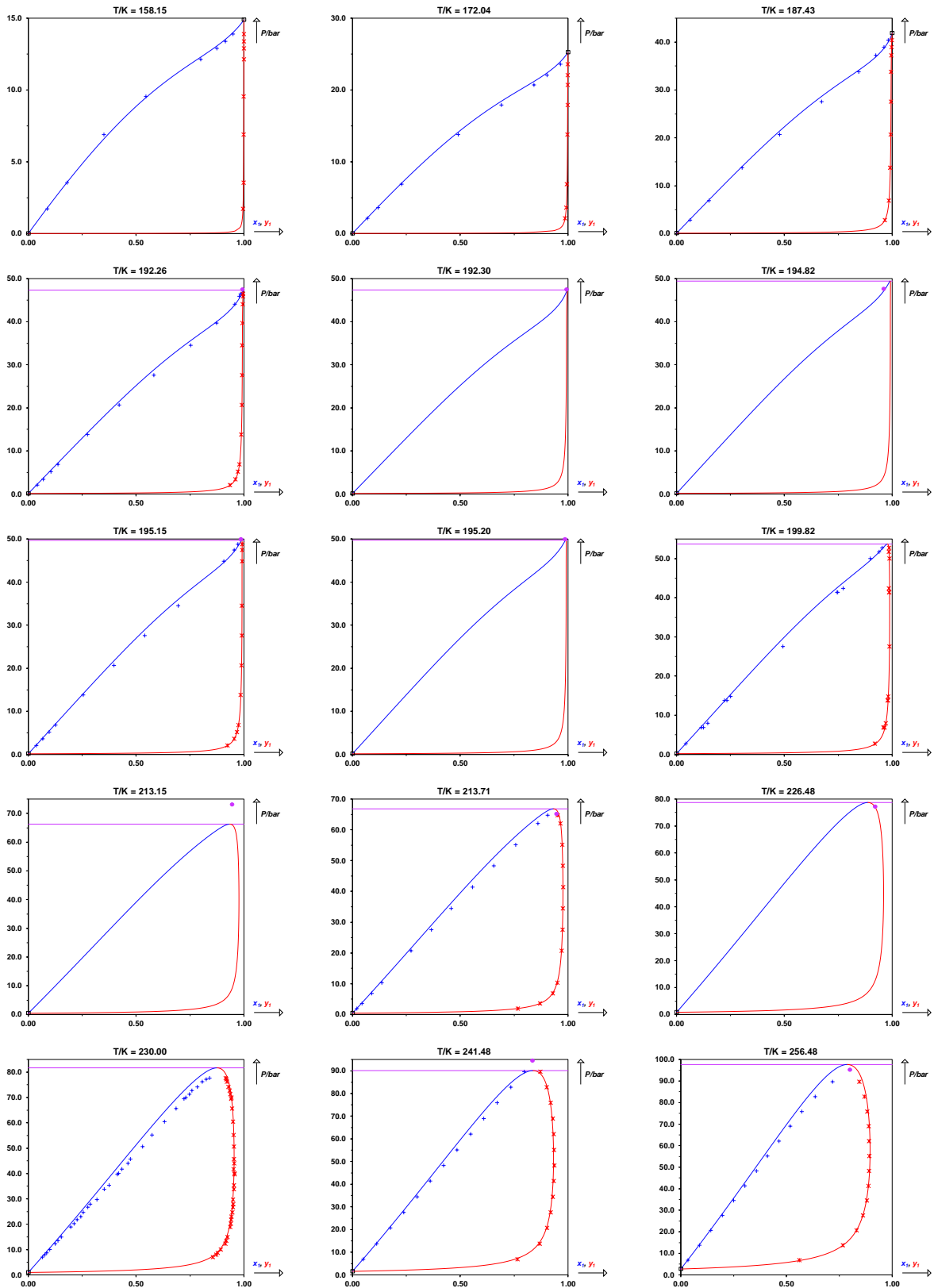
NA-NA systems (BAC = 1)

316.21	86.19	0.4900
327.98	79.84	0.4200
344.82	66.95	0.2800
356.15	56.74	0.1700

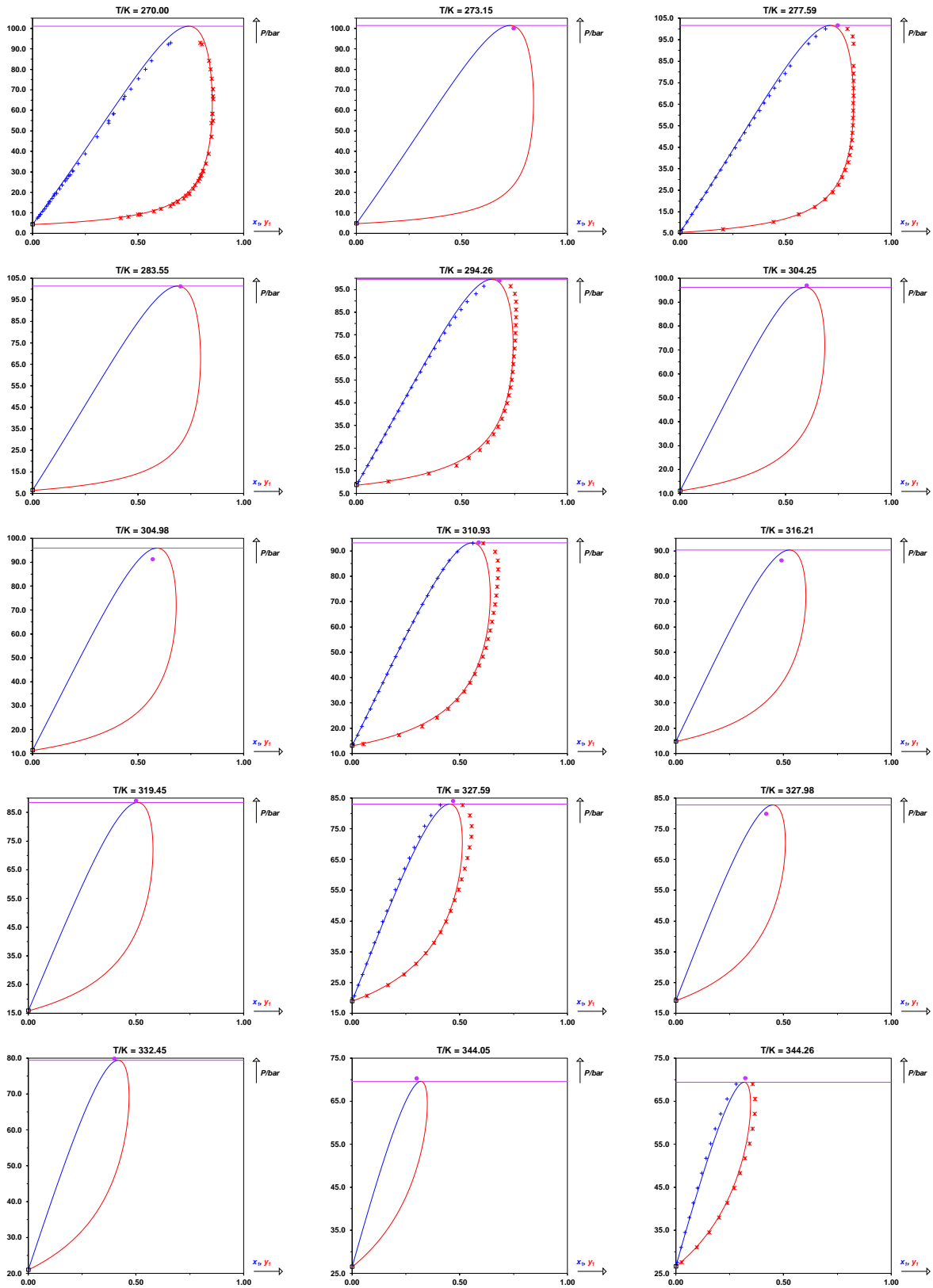
NA-NA systems (BAC = 1)



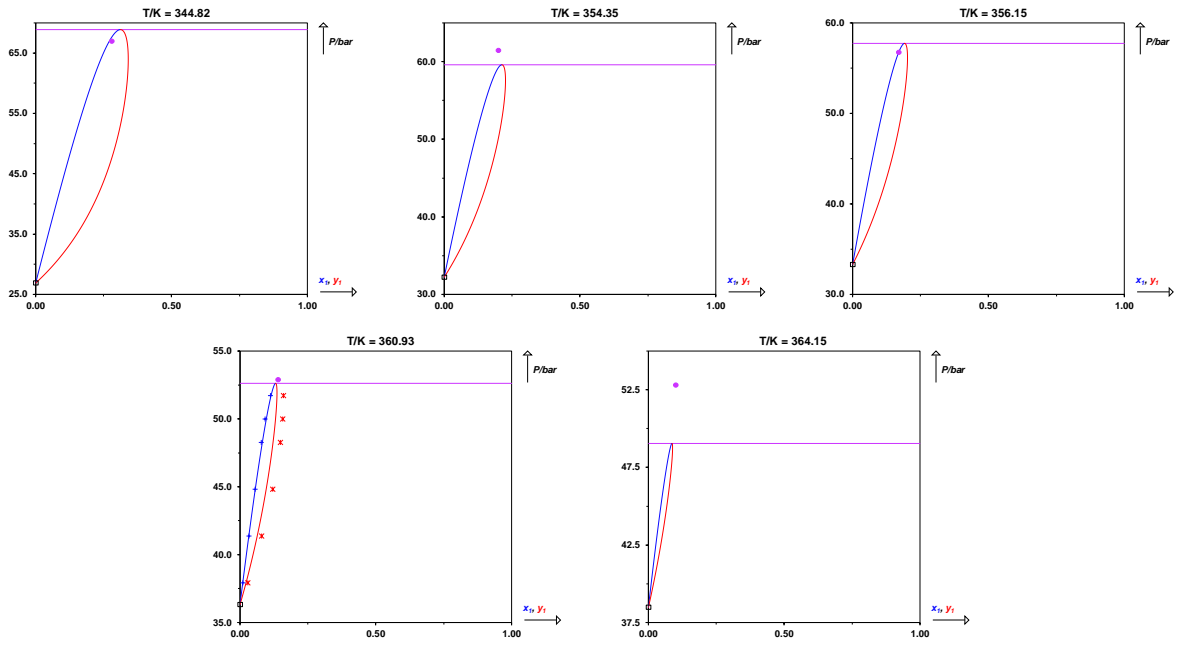
NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



METHANE (1) + n-BUTANE (2)

CAS	74-82-8	106-97-8
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	IJDNQMDRQITEOD-UHFFFAOYSA-N
T_c / K	190.56	425.12
P_c / bar	45.99	37.96
ω	0.012	0.200

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 16.06$

$B/\text{MPa} = -53.01$

Deviations

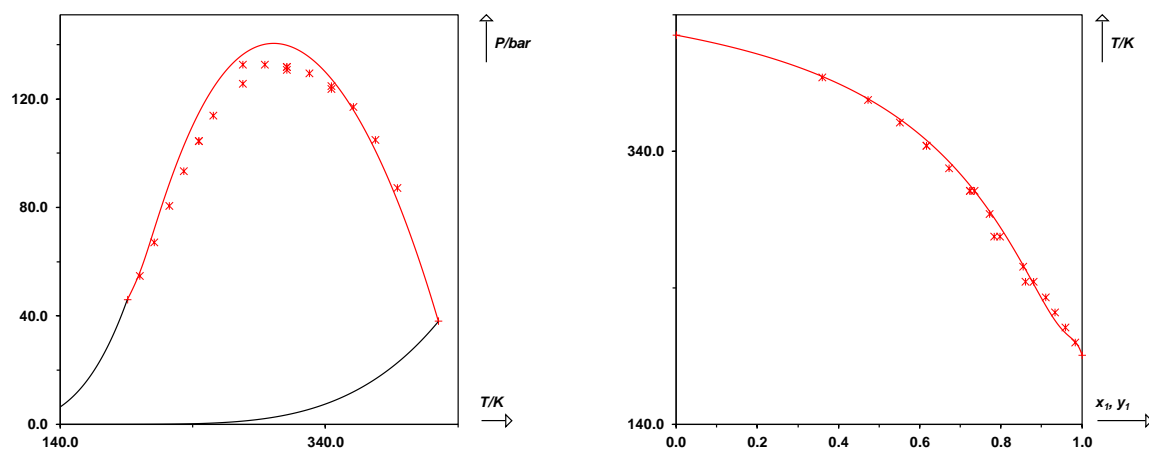
MAPE on $x = 5.0\%$

MAPE on $y = 4.5\%$

MAPE on $x_c = 4.3\%$

MAPE on $P_c = 6.0\%$

MAPE on $h^M = 71\%$



-----			1.379	0.0250	0.9917
Isothermal phase equilibrium data			2.758	0.0510	0.9955
-----			5.585	0.1030	0.9975
Kahre, LeRoy C., Low-temperature K data for methane-butane, Journal of Chemical & Engineering Data. 19 (1974) 67-71. doi:10.1021/je60060a014			6.895	0.1300	0.9979
T / K =	166.48		13.79	0.2480	0.9986
P / bar	x ₁	y ₁	27.51	0.5000	0.9988
1.379	0.0470	0.9994	41.03	0.8300	0.9980
3.378	0.1160	0.9997	43.23	0.8960	0.9977
6.895	0.2510	0.9998	44.75	0.9300	0.9975
10.20	0.3790	0.9999	46.68	0.9680	0.9972
13.72	0.5450	0.9999	Elliot, Douglas G. - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of methane-butane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 19 (1974) 71-77. doi:10.1021/je60060a015		
17.17	0.7530	0.9999	T / K = 199.88		
18.75	0.8970	0.9999	P / bar	x ₁	y ₁
19.51	0.9500	0.9999	13.80	0.2267	0.9976
Kahre, LeRoy C., Low-temperature K data for methane-butane, Journal of Chemical & Engineering Data. 19 (1974) 67-71. doi:10.1021/je60060a014			20.71	0.3261	0.9979
T / K =	177.59		27.58	0.4267	0.9980
P / bar	x ₁	y ₁	34.47	0.5322	0.9977
1.379	0.0360	0.9981	41.37	0.6591	0.9971
3.447	0.0910	0.9992	48.26	0.8296	0.9958
6.895	0.1800	0.9995	51.71	0.9257	0.9944
13.79	0.3600	0.9996	Kahre, LeRoy C., Low-temperature K data for methane-butane, Journal of Chemical & Engineering Data. 19 (1974) 67-71. doi:10.1021/je60060a014		
20.62	0.5730	0.9997	T / K = 210.93		
24.41	0.7320	0.9997	P / bar	x ₁	y ₁
26.61	0.8750	0.9997	1.379	0.0190	0.9690
27.86	0.9340	0.9997	2.758	0.0380	0.9840
Kahre, LeRoy C., Low-temperature K data for methane-butane, Journal of Chemical & Engineering Data. 19 (1974) 67-71. doi:10.1021/je60060a014			5.516	0.0770	0.9913
T / K =	185.93		8.274	0.1110	0.9936
P / bar	x ₁	y ₁	11.03	0.1480	0.9948
1.379	0.0280	0.9956	13.79	0.1840	0.9955
3.447	0.0690	0.9981	27.51	0.3610	0.9965
6.895	0.1440	0.9989	41.30	0.5320	0.9959
13.79	0.2900	0.9993	55.02	0.7210	0.9934
20.62	0.4440	0.9993	67.09	0.9330	0.9802
27.51	0.6080	0.9993	Elliot, Douglas G. - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of methane-butane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 19 (1974) 71-77. doi:10.1021/je60060a015		
30.96	0.7280	0.9992	T / K = 222.07		
34.41	0.8710	0.9991	P / bar	x ₁	y ₁
37.85	0.9720	0.9993	6.909	0.0820	0.9840
Kahre, LeRoy C., Low-temperature K data for methane-butane, Journal of Chemical & Engineering Data. 19 (1974) 67-71. doi:10.1021/je60060a014			13.81	0.1586	0.9903
T / K =	194.09		-----		
P / bar	x ₁	y ₁			

NA-NA systems (BAC = 1)

27.58	0.2981	0.9930	13.81	0.1124	0.9516
41.37	0.4284	0.9926	20.71	0.1643	0.9639
55.16	0.5564	0.9905	27.58	0.2135	0.9689
68.95	0.7056	0.9843	34.48	0.2580	0.9716
75.84	0.8001	0.9774	48.26	0.3455	0.9729
79.29	0.8637	0.9648	55.16	0.3905	0.9728

Elliot, Douglas G. - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of methane-butane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 19 (1974) 71-77. doi:10.1021/je60060a015

T / K = 233.18

P / bar	x ₁	y ₁	
6.915	0.0721	0.9703	
13.81	0.1400	0.9827	
27.58	0.2655	0.9878	
41.37	0.3739	0.9882	
55.16	0.4804	0.9868	
68.95	0.5875	0.9822	
82.74	0.6948	0.9705	
89.63	0.7886	0.9608	
93.08	0.8549	0.9318	
93.42	0.9097	0.9097	CRIT

Elliot, Douglas G. - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of methane-butane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 19 (1974) 71-77. doi:10.1021/je60060a015

T / K = 244.28

P / bar	x ₁	y ₁	
6.909	0.0630	0.9488	
13.81	0.1237	0.9703	
27.58	0.2335	0.9801	
41.37	0.3325	0.9818	
55.16	0.4223	0.9809	
68.95	0.5101	0.9772	
82.74	0.6062	0.9688	
96.53	0.7189	0.9498	
103.42	0.8059	0.9150	
104.46	0.8805	0.8805	CRIT

Elliot, Douglas G. - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of methane-butane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 19 (1974) 71-77. doi:10.1021/je60060a015

T / K = 255.38

P / bar	x ₁	y ₁
3.475	0.0257	0.8370
6.922	0.0559	0.9161

13.81	0.1124	0.9516	
20.71	0.1643	0.9639	
27.58	0.2135	0.9689	
34.48	0.2580	0.9716	
48.26	0.3455	0.9729	
55.16	0.3905	0.9728	
68.95	0.4651	0.9696	
82.74	0.5466	0.9625	
96.53	0.6326	0.9499	
110.32	0.7498	0.9175	
113.90	0.8543	0.8543	CRIT

Elliot, Douglas G. - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of methane-butane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 19 (1974) 71-77. doi:10.1021/je60060a015

T / K = 277.59

P / bar	x ₁	y ₁
6.922	0.0426	0.7960
13.82	0.0899	0.8900
20.71	0.1339	0.9176
27.58	0.1759	0.9313
34.48	0.2152	0.9385
41.37	0.2536	0.9425
55.16	0.3262	0.9469
68.95	0.3976	0.9459
82.74	0.4651	0.9390
96.53	0.5331	0.9294
110.32	0.6078	0.9100
117.21	0.6558	0.8967
124.11	0.7278	0.8460

Wiese, H. C. - Jacobs, Joan - Sage, B. H., Phase equilibria in the hydrocarbon systems. Phase behavior in the methane-propane-n-butane system, Journal of Chemical & Engineering Data. 15 (1970) 82-91. doi:10.1021/je60044a021

T / K = 277.59

P / bar	x ₁	y ₁	
13.79	0.0808	0.8888	
34.47	0.1913	0.9369	
68.95	0.3651	0.9461	
86.19	0.4513	0.9407	
103.42	0.5390	0.9262	
117.21	0.6194	0.9044	
132.59	0.7970	0.7970	CRIT

Sage, R. H. - Hicks, B. L. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 32 (1940) 1085-1092. doi:10.1021/ie50368a014

NA-NA systems (BAC = 1)

T / K = 294.26					
P / bar	x ₁	y ₁			
2.758	0.0036	0.2103	13.79	0.0530	0.7027
4.137	0.0111	0.4593	20.69	0.0872	0.7827
5.516	0.0186	0.5843	27.58	0.1216	0.8239
6.895	0.0263	0.6600	34.48	0.1556	0.8473
10.34	0.0452	0.7591	41.37	0.1889	0.8623
13.79	0.0639	0.8088	55.16	0.2540	0.8775
20.69	0.1011	0.8587	68.95	0.3171	0.8809
27.58	0.1380	0.8831	82.74	0.3810	0.8799
34.48	0.1744	0.8978	86.19	0.3974	0.8786
41.37	0.2106	0.9074	96.53	0.4465	0.8731
55.16	0.2804	0.9174	103.42	0.4799	0.8665
68.95	0.3490	0.9202	110.32	0.5168	0.8570
82.74	0.4162	0.9178	117.21	0.5586	0.8440
86.19	0.4305	0.9162	120.66	0.5837	0.8349
96.53	0.4775	0.9087	124.11	0.6110	0.8227
103.42	0.5101	0.9026	127.55	0.6435	0.8053
110.32	0.5451	0.8942	131.00	0.7032	0.7709
117.21	0.5863	0.8827	131.83	0.7236	0.7236 CRIT
120.66	0.6105	0.8750			
124.11	0.6375	0.8652			
127.55	0.6700	0.8511			
131.00	0.7152	0.8253			
132.59	0.7712	0.7712			CRIT

Rigas, T. J. - Mason, D. F. - Thodos, George, Vapor-Liquid Equilibria. Microsampling Technique Applied to a New Variable-Volume Cell, Industrial & Engineering Chemistry. 50 (1958) 1297-1300. doi:10.1021/ie50585a039

T / K = 310.93					
P / bar	x ₁	y ₁			
66.19	0.3110	0.8790	6.895	0.0065	0.1790
81.70	0.3880	0.8780	10.34	0.0235	0.4301
98.73	0.4760	0.8680	13.79	0.0404	0.5531
111.49	0.5370	0.8500	20.69	0.0734	0.6777
116.66	0.5580	0.8330	27.58	0.1060	0.7390
126.38	0.6580	0.8060	34.48	0.1382	0.7745
128.31	0.6770	0.7860	41.37	0.1697	0.7966
130.66	0.7350	0.7350	55.16	0.2319	0.8193
			68.95	0.2934	0.8270
			82.74	0.3557	0.8283
			86.19	0.3716	0.8275
			96.53	0.4194	0.8218
			103.42	0.4521	0.8146
			110.32	0.4888	0.8042
			117.21	0.5284	0.7864
			120.66	0.5549	0.7739
			124.11	0.5796	0.7566
			127.55	0.6229	0.7294
			129.35	0.6718	0.6718 CRIT

Sage, R. H. - Hicks, B. L. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 32 (1940) 1085-1092. doi:10.1021/ie50368a014

T / K = 310.93					
P / bar	x ₁	y ₁			
4.137	0.0029	0.1335			
5.516	0.0104	0.3369			
6.895	0.0175	0.4596			
10.34	0.0353	0.6225			

Sage, R. H. - Hicks, B. L. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 32 (1940) 1085-1092. doi:10.1021/ie50368a014

T / K = 327.59					
P / bar	x ₁	y ₁			
6.895	0.0065	0.1790			
10.34	0.0235	0.4301			
13.79	0.0404	0.5531			
20.69	0.0734	0.6777			
27.58	0.1060	0.7390			
34.48	0.1382	0.7745			
41.37	0.1697	0.7966			
55.16	0.2319	0.8193			
68.95	0.2934	0.8270			
82.74	0.3557	0.8283			
86.19	0.3716	0.8275			
96.53	0.4194	0.8218			
103.42	0.4521	0.8146			
110.32	0.4888	0.8042			
117.21	0.5284	0.7864			
120.66	0.5549	0.7739			
124.11	0.5796	0.7566			
127.55	0.6229	0.7294			
129.35	0.6718	0.6718			CRIT

Sage, R. H. - Hicks, B. L. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 32 (1940) 1085-1092. doi:10.1021/ie50368a014

T / K = 344.26					
P / bar	x ₁	y ₁			

NA-NA systems (BAC = 1)

10.34	0.0090	0.1722		82.74	0.3012	0.5613	
13.79	0.0242	0.3518		86.19	0.3190	0.5583	
20.69	0.0573	0.5318		89.63	0.3363	0.5530	
27.58	0.0885	0.6233		96.53	0.3819	0.5370	
34.48	0.1201	0.6766		99.97	0.4038	0.5228	
41.37	0.1513	0.7098		103.42	0.4376	0.4987	
55.16	0.2119	0.7451		104.80	0.4721	0.4721	CRIT
68.95	0.2739	0.7574					
82.74	0.3328	0.7594					
86.19	0.3482	0.7588					
96.53	0.3978	0.7528					
103.42	0.4329	0.7439					
110.32	0.4696	0.7285					
117.21	0.5104	0.7037					
120.66	0.5425	0.6831					
124.11	0.5683	0.6440					
124.80	0.6165	0.6165	CRIT				

Sage, R. H. - Hicks, B. L. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 32 (1940) 1085-1092. doi:10.1021/ie50368a014

T / K = 360.93

P / bar	x ₁	y ₁	
13.79	0.0079	0.1110	
20.69	0.0387	0.3626	
27.58	0.0695	0.4849	
34.48	0.1005	0.5580	
41.37	0.1309	0.6037	
55.16	0.1916	0.6529	
68.95	0.2521	0.6718	
82.74	0.3154	0.6745	
86.19	0.3319	0.6734	
96.53	0.3861	0.6645	
103.42	0.4263	0.6518	
110.32	0.4685	0.6266	
113.76	0.4918	0.6054	
117.07	0.5503	0.5503	CRIT

Sage, R. H. - Hicks, B. L. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 32 (1940) 1085-1092. doi:10.1021/ie50368a014

T / K = 377.59

P / bar	x ₁	y ₁	
20.69	0.0175	0.1599	
27.58	0.0476	0.3242	
34.48	0.0783	0.4201	
41.37	0.1094	0.4799	
55.16	0.1722	0.5428	
68.95	0.2356	0.5630	

Sage, R. H. - Hicks, B. L. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 32 (1940) 1085-1092. doi:10.1021/ie50368a014

T / K = 394.26

P / bar	x ₁	y ₁	
27.58	0.0218	0.1418	
34.48	0.0530	0.2650	
41.37	0.0850	0.3411	
55.16	0.1519	0.4148	
68.95	0.2192	0.4327	
75.84	0.2638	0.4294	
82.74	0.3021	0.4101	
86.19	0.3396	0.3851	
87.15	0.3602	0.3602	CRIT

Enthalpy of mixing

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 277.00

P / bar = 1.013

h ^M / J.mol ⁻¹	z ₁	
32.50	0.2090	
36.90	0.2730	
43.00	0.3330	
49.90	0.4270	
51.20	0.4760	
49.20	0.5690	
47.10	0.6100	
41.80	0.6740	
36.70	0.7300	

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 284.20

P / bar = 1.013

$h^M / \text{J.mol}^{-1}$	z_1
35.60	0.2850
42.20	0.3800
45.40	0.4470
43.00	0.6000
41.40	0.6350
38.70	0.6790
35.20	0.7400
27.30	0.7960

Critical point

Elliott, D.G. - Lin, Y.N. - Chu, T.C. - Chappellear, P.S. - Kobayashi, R., K-values for the methane - n-butane, methane - n-pentane, and methane - n-hexane systems, GPA Research Report. (1976) 1-19.

T / K	P / bar	x_1
199.88	54.61	0.9829
222.07	80.60	0.9326
244.28	104.46	0.8605
277.59	125.62	0.7828

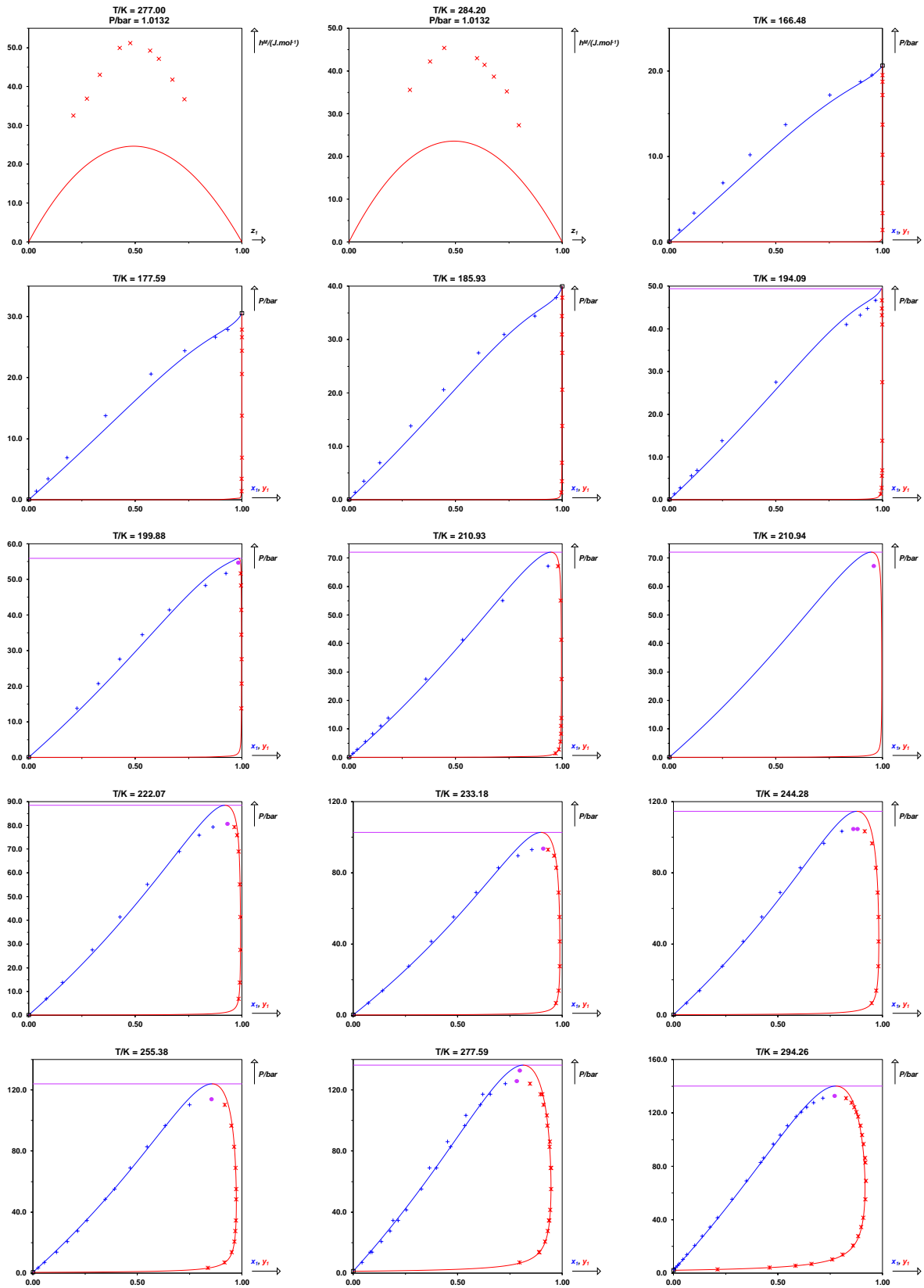
Elliot, Douglas G. - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of methane-butane system at low temperatures and high pressures, Journal of Chemical & Engineering Data. 19 (1974) 71-77. doi:10.1021/je60060a015

T / K	P / bar	x_1
210.94	67.09	0.9591

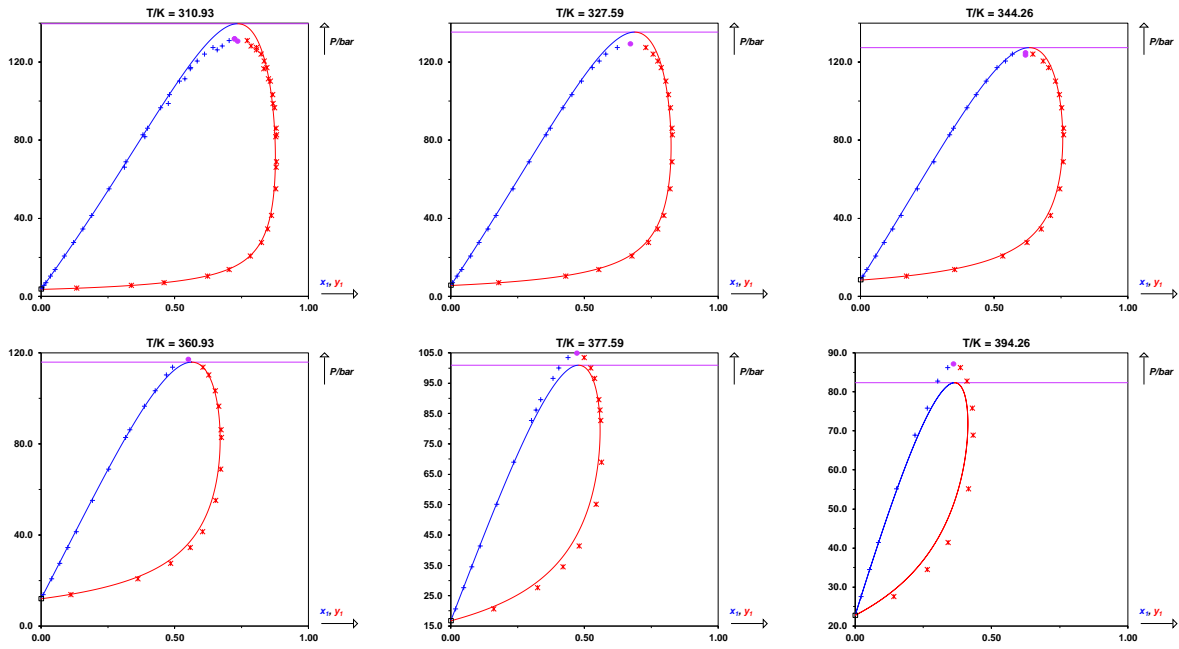
Wiese, H. C. - Jacobs, Joan - Sage, B. H., Phase equilibriums in the hydrocarbon systems. Phase behavior in the methane-propane-n-butane system, Journal of Chemical & Engineering Data. 15 (1970) 82-91. doi:10.1021/je60044a021

T / K	P / bar	x_1
310.93	131.83	0.7236
344.26	123.55	0.6165

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



METHANE (1) + n-HEXANE (2)

CAS	74-82-8	110-54-3
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	VLKZOEYOYAKHREP-UHFFFAOYSA-N
T_c / K	190.56	507.60
P_c / bar	45.99	30.25
ω	0.012	0.301

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 16.54$

$B/\text{MPa} = 12.63$

Deviations

MAPE on $x = 6.1\%$

MAPE on $y = 11\%$

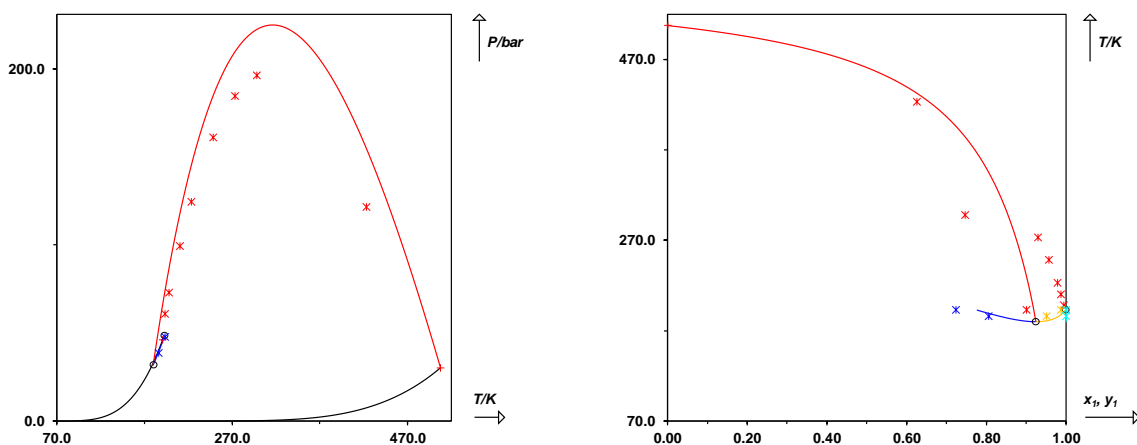
MAPE on $x_c = 156\%$

MAPE on $P_c = 18\%$

MAPE on $z_{LLV} = 25\%$

MAPE on $P_{LLV} = 2.2\%$

MAPE on $h^M = 53\%$



Isothermal phase equilibrium data			T / K =	198.05	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
38.54	0.8057	0.9505	1.372	0.0195	0.9998
39.99	0.8199	0.9412	1.724	0.0244	0.9999
41.37	0.8313	0.9335	3.447	0.0474	0.9999
42.20	0.8515	0.9246	6.895	0.0960	0.9999
			10.34	0.1390	1.0000
			13.79	0.1813	1.0000
			20.68	0.2660	0.9999
			27.58	0.3412	0.9999
			34.47	0.4225	0.9999
			41.37	0.5076	0.9998
			48.26	0.5936	0.9996
			55.16	0.6872	0.9979
			62.05	0.7596	0.9957
			68.95	0.8117	0.9943
			72.88	0.9936	0.9936 CRIT
Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007			Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007		
Isothermal phase equilibrium data			T / K =	210.15	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
47.71	0.7239	0.9864	1.393	0.0156	0.9995
49.64	0.7415	0.9785	1.738	0.0187	0.9996
51.02	0.7531	0.9716	3.461	0.0378	0.9998
52.40	0.7649	0.9660	6.909	0.0731	0.9999
55.16	0.7858	0.9522	10.36	0.1079	0.9999
56.54	0.7949	0.9445	13.80	0.1411	0.9999
57.92	0.8098	0.9377	20.70	0.2071	0.9999
59.30	0.8278	0.9238	27.59	0.2700	0.9999
60.88	0.9004	0.9004 CRIT	41.37	0.3881	0.9998
			55.16	0.5139	0.9994
			68.95	0.6162	0.9973
			82.74	0.7156	0.9918
			96.53	0.8091	0.9882
			99.49	0.9872	0.9872 CRIT
Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007			Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007		
Isothermal phase equilibrium data			T / K =	223.15	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
52.06	0.7177	0.9976	1.393	0.0141	0.9984
55.16	0.7425	0.9851	1.738	0.0171	0.9987
58.61	0.7701	0.9769	3.461	0.0337	0.9993
60.67	0.7809	0.9674	6.909	0.0637	0.9996
62.74	0.7950	0.9520			
65.50	0.8151	0.9390			
67.22	0.8416	0.9133			
Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007			Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007		

NA-NA systems (BAC = 1)

10.36	0.0921	0.9997		117.21	0.6123	0.9889	
13.80	0.1218	0.9998		124.11	0.6382	0.9844	
20.70	0.1771	0.9998		137.90	0.6937	0.9752	
27.59	0.2294	0.9998		151.68	0.7601	0.9644	
41.37	0.3282	0.9996		158.58	0.8191	0.9593	
55.16	0.4207	0.9993		161.13	0.9564	0.9564	CRIT
68.95	0.4952	0.9985					
82.74	0.5893	0.9961					
96.53	0.6518	0.9901					
103.42	0.7011	0.9871					
110.32	0.7423	0.9841					
117.21	0.7774	0.9816					
124.38	0.9784	0.9784	CRIT				

Kandil, Mohamed E. - Thoma, Markus J. - Syed, Tauqir - Guo, Jerry - Graham, Brendan F. - Marsh, Kenneth N. - Huang, Stanley H. - May, Eric F., Vapor-Liquid Equilibria Measurements of the Methane + Pentane and Methane + Hexane Systems at Temperatures from (173 to 330) K and Pressures to 14 MPa, Journal of Chemical & Engineering Data. 56 (2011) 4301-4309. doi:10.1021/je200101x

T / K = 233.15

P / bar	x ₁	y ₁
19.80	0.1820	0.9991
40.60	0.3140	0.9989
59.10	0.4150	0.9982
79.90	0.5170	0.9963
103.60	0.6470	0.9895
128.70	0.9590	0.9750

Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007

T / K = 248.14

P / bar	x ₁	y ₁
1.386	0.0095	0.9899
1.731	0.0115	0.9918
3.454	0.0232	0.9956
6.902	0.0464	0.9976
10.35	0.0688	0.9982
13.80	0.0900	0.9985
20.69	0.1340	0.9987
27.59	0.1819	0.9988
41.38	0.2595	0.9986
55.16	0.3347	0.9982
68.95	0.3998	0.9976
82.74	0.4672	0.9963
96.53	0.5252	0.9942
110.32	0.5804	0.9905

Kandil, Mohamed E. - Thoma, Markus J. - Syed, Tauqir - Guo, Jerry - Graham, Brendan F. - Marsh, Kenneth N. - Huang, Stanley H. - May, Eric F., Vapor-Liquid Equilibria Measurements of the Methane + Pentane and Methane + Hexane Systems at Temperatures from (173 to 330) K and Pressures to 14 MPa, Journal of Chemical & Engineering Data. 56 (2011) 4301-4309. doi:10.1021/je200101x

T / K = 253.15

P / bar	x ₁	y ₁
20.40	0.1520	0.9967
39.70	0.2590	0.9980
61.50	0.3610	0.9972
91.30	0.4770	0.9944
118.70	0.5750	0.9943

Lin, Yueh-Neu - Chen, Roger J. J. - Chappellear, Patsy S. - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-n-hexane system at low temperature, Journal of Chemical & Engineering Data. 22 (1977) 402-408. doi:10.1021/je60075a007

T / K = 273.16

P / bar	x ₁	y ₁	
1.731	0.0097	0.9643	
3.454	0.0196	0.9815	
6.902	0.0387	0.9898	
10.35	0.0567	0.9927	
13.80	0.0744	0.9940	
20.69	0.1116	0.9953	
27.59	0.1469	0.9957	
41.37	0.2127	0.9958	
55.16	0.2742	0.9955	
68.95	0.3328	0.9947	
82.74	0.3886	0.9934	
96.53	0.4435	0.9917	
110.32	0.4924	0.9891	
124.11	0.5400	0.9849	
137.90	0.5933	0.9797	
151.68	0.6401	0.9692	
165.47	0.6949	0.9565	
175.82	0.7462	0.9400	
179.26	0.7758	0.9366	
182.71	0.8025	0.9348	
184.43	0.9290	0.9290	CRIT

Kandil, Mohamed E. - Thoma, Markus J. - Syed, Tauqir - Guo, Jerry - Graham, Brendan F. - Marsh, Kenneth N. - Huang, Stanley H. - May, Eric F., Vapor-Liquid Equilibria Measurements of the Methane + Pentane and Methane + Hexane Systems at Temperatures from (173 to 330) K and Pressures to 14 MPa, Journal of Chemical & Engineering Data. 56 (2011) 4301-4309. doi:10.1021/je200101x

T / K = 288.15		
P / bar	x ₁	y ₁
23.50	0.1360	0.9903
42.00	0.2210	0.9874
62.20	0.2990	0.9863
89.30	0.4000	0.9870
123.20	0.5160	0.9778

Stepanova, G.S. - Vybornova, Y.I., Phase equilibriums of methane-hexane system, Tr. Vses. Nauchno Issled. Inst. Prir. Gazov. (1962) 203-208.

T / K = 293.15		
P / bar	x ₁	y ₁
98.17	0.4034	0.9889
124.99	0.5011	0.9829
138.52	0.5677	0.9778
167.29	0.6569	0.9639
184.33	0.7034	0.9525
192.22	0.7563	0.9207

Shim, Joosup - Kohn, J. P., Multiphase and Volumetric Equilibria of Methane-n-Hexane Binary System at Temperatures Between -110° and 150° C., Journal of Chemical & Engineering Data. 7 (1962) 3-8. doi:10.1021/je60012a002

T / K = 298.15			
P / bar	x ₁	y ₁	
10.13	0.0490	0.9530	
20.27	0.0978	0.9728	
30.40	0.1450	0.9795	
40.53	0.1890	0.9830	
50.66	0.2316	0.9850	
60.80	0.2710	0.9863	
70.93	0.3090	0.9871	
81.06	0.3447	0.9868	
91.19	0.3810	0.9854	
101.33	0.4125	0.9833	
196.17	0.7466	0.7466	CRIT

Kandil, Mohamed E. - Thoma, Markus J. - Syed, Tauqir - Guo, Jerry - Graham, Brendan F. - Marsh, Kenneth N. - Huang, Stanley H. - May, Eric F., Vapor-Liquid Equilibria Measurements of the Methane + Pentane and Methane + Hexane Systems at Temperatures from (173 to 330) K and Pressures to 14 MPa, Journal of Chemical & Engineering Data. 56 (2011) 4301-4309. doi:10.1021/je200101x

T / K = 303.15		
P / bar	x ₁	y ₁
20.70	0.1120	0.9832
58.70	0.2670	0.9801
83.90	0.3530	0.9818
110.70	0.4450	0.9771
141.90	0.5460	0.9830

Poston, R. S. - McKetta, J. J., Vapor-Liquid Equilibrium in the Methane-n-Hexane System., Journal of Chemical & Engineering Data. 11 (1966) 362-363. doi:10.1021/je60030a021

T / K = 310.93		
P / bar	x ₁	y ₁
34.46	0.1530	0.9690
68.93	0.2860	0.9800
103.39	0.4040	0.9790
137.85	0.5110	0.9700
172.32	0.6380	0.9690
186.10	0.6940	0.9700
190.59	0.7150	0.9680
196.10	0.7560	0.9640
194.73	0.7400	0.9620
197.83	0.7600	0.9570

Gunn, Robert D. - McKetta, John J. - Ata, Nassar, Measurement and prediction of high-pressure phase equilibria with a dilute component in the gas phase: The methane-n-hexane system, AIChE Journal. 20 (1974) 347-353. doi:10.1002/aic.690200221

T / K = 310.93		
P / bar	x ₁	y ₁
3.445	0.0152	0.8923
6.890	0.0319	0.9451
10.35	0.0482	0.9606
13.79	0.0642	0.9696
17.24	0.0798	0.9728

Stepanova, G.S. - Vybornova, Y.I., Phase equilibriums of methane-hexane system, Tr. Vses. Nauchno Issled. Inst. Prir. Gazov. (1962) 203-208.

T / K = 313.15		
P / bar	x ₁	y ₁
58.89	0.2433	0.9820
75.72	0.3042	0.9836
98.65	0.3997	0.9764
127.41	0.4819	0.9738
143.60	0.5354	0.9607
167.77	0.6142	0.9499
197.14	0.7236	0.9130

Kandil, Mohamed E. - Thoma, Markus J. - Syed, Tauqir - Guo, Jerry - Graham, Brendan F. - Marsh, Kenneth N. - Huang, Stanley H. - May, Eric F., Vapor-Liquid Equilibria Measurements of the Methane + Pentane and Methane + Hexane Systems at Temperatures from (173 to 330) K and Pressures to 14 MPa, Journal of Chemical & Engineering Data. 56 (2011) 4301-4309. doi:10.1021/je200101x

T / K = 318.15		
P / bar	x ₁	y ₁
24.30	0.1220	0.9717
51.10	0.2280	0.9772
77.50	0.3230	0.9756
111.80	0.4290	0.9679
142.10	0.5290	0.9783

Marteau, Ph. - Obriot, J. - Barreau, A. - Ruffier-Meray, V. - Behar, E., Experimental determination of the phase behavior of binary mixtures: methane-hexane and methane-benzene, Fluid Phase Equilibria. 129 (1997) 285-305. doi:10.1016/S0378-3812(96)03125-1

T / K = 323.00		
P / bar	x ₁	y ₁
140.10	0.5126	0.9580
150.10	0.5414	0.9511
158.80	0.5682	0.9477
159.10	0.5709	0.9497
170.40	0.6063	0.9368
180.10	0.6441	0.9216
190.00	0.6861	0.9164
195.00	0.7036	0.8885
197.30	0.7252	0.8768
199.80	0.7386	0.8572
200.40	0.7633	0.8532
201.10	0.7748	0.8416

Shim, Joosup - Kohn, J. P., Multiphase and Volumetric Equilibria of Methane-n-Hexane Binary System at Temperatures Between -110° and 150° C., Journal of Chemical & Engineering Data. 7 (1962) 3-8. doi:10.1021/je60012a002

T / K = 323.15		
P / bar	x ₁	y ₁
10.13	0.0422	0.9021
20.27	0.0860	0.9465
30.40	0.1290	0.9614
40.53	0.1690	0.9680
50.66	0.2080	0.9719
60.80	0.2458	0.9747
70.93	0.2820	0.9765
81.06	0.3186	0.9770
91.19	0.3540	0.9768
101.33	0.3850	0.9751

Poston, R. S. - McKetta, J. J., Vapor-Liquid Equilibrium in the Methane-n-Hexane System., Journal of Chemical & Engineering Data. 11 (1966) 362-363. doi:10.1021/je60030a021

T / K = 344.26		
P / bar	x ₁	y ₁
34.46	0.1350	0.9370
68.93	0.2580	0.9530
103.39	0.3710	0.9620
137.85	0.4850	0.9460
172.32	0.5940	0.9280
186.10	0.6680	0.9130
189.55	0.7010	0.9110
192.66	0.7030	0.8850

Gunn, Robert D. - McKetta, John J. - Ata, Nassar, Measurement and prediction of high-pressure phase equilibria with a dilute component in the gas phase: The methane-n-hexane system, AIChE Journal. 20 (1974) 347-353. doi:10.1002/aic.690200221

T / K = 344.26		
P / bar	x ₁	y ₁
3.445	0.0107	0.6791
6.890	0.0256	0.8281
10.35	0.0405	0.8830
13.79	0.0551	0.9097
17.24	0.0694	0.9257

Marteau, Ph. - Obriot, J. - Barreau, A. - Ruffier-Meray, V. - Behar, E., Experimental determination of the phase behavior of binary mixtures: methane-hexane and methane-benzene, Fluid Phase Equilibria. 129 (1997) 285-305. doi:10.1016/S0378-3812(96)03125-1

T / K = 373.00		
P / bar	x ₁	y ₁
59.80	0.2169	0.9097
71.00	0.2517	0.9185
80.60	0.2868	0.9119
90.00	0.3094	0.9161
99.80	0.3408	0.9151
112.10	0.3753	0.9132
120.00	0.4038	0.9080
130.10	0.4362	0.9180
140.30	0.4715	0.8936
150.00	0.5013	0.8848
160.00	0.5397	0.8672
164.60	0.5596	0.8593
170.20	0.5878	0.8488
174.90	0.6085	0.8340
177.00	0.6178	0.8286
179.10	0.6286	0.8176

NA-NA systems (BAC = 1)

180.50	0.6438	0.8119
182.10	0.6565	0.8004
183.60	0.6807	0.7837
184.00	0.6953	0.7840
184.30	0.7109	0.7763

Shim, Joosup - Kohn, J. P., Multiphase and Volumetric Equilibria of Methane-n-Hexane Binary System at Temperatures Between -110° and 150° C., Journal of Chemical & Engineering Data. 7 (1962) 3-8. doi:10.1021/je60012a002

T / K = 373.15

P / bar	x ₁	y ₁
10.13	0.0300	0.7875
20.27	0.0688	0.8316
30.40	0.1065	0.8760
40.53	0.1440	0.8970
50.66	0.1810	0.9082
60.80	0.2160	0.9158
70.93	0.2490	0.9224
81.06	0.2807	0.9280
91.19	0.3135	0.9321
101.33	0.3434	0.9340

Poston, R. S. - McKetta, J. J., Vapor-Liquid Equilibrium in the Methane-n-Hexane System., Journal of Chemical & Engineering Data. 11 (1966) 362-363. doi:10.1021/je60030a021

T / K = 377.55

P / bar	x ₁	y ₁
34.46	0.1190	0.8710
68.93	0.2400	0.9110
103.39	0.3510	0.9080
137.85	0.4770	0.8950
172.32	0.6040	0.8610
175.08	0.6180	0.8220
177.84	0.6500	0.8170
180.25	0.6750	0.7840

Gunn, Robert D. - McKetta, John J. - Ata, Nassar, Measurement and prediction of high-pressure phase equilibria with a dilute component in the gas phase: The methane-n-hexane system, AIChE Journal. 20 (1974) 347-353. doi:10.1002/aic.690200221

T / K = 377.55

P / bar	x ₁	y ₁
6.890	0.0164	0.5583
10.35	0.0299	0.6877
13.79	0.0431	0.7531
17.24	0.0563	0.7961

Poston, R. S. - McKetta, J. J., Vapor-Liquid Equilibrium in the Methane-n-Hexane System., Journal of Chemical & Engineering Data. 11 (1966) 362-363. doi:10.1021/je60030a021

T / K = 410.95

P / bar	x ₁	y ₁
34.46	0.1030	0.7380
68.93	0.2230	0.8110
103.39	0.3450	0.8300
137.85	0.4770	0.8030
146.82	0.5280	0.7680
150.27	0.5560	0.7510
153.16	0.5980	0.7250

Gunn, Robert D. - McKetta, John J. - Ata, Nassar, Measurement and prediction of high-pressure phase equilibria with a dilute component in the gas phase: The methane-n-hexane system, AIChE Journal. 20 (1974) 347-353. doi:10.1002/aic.690200221

T / K = 410.95

P / bar	x ₁	y ₁
13.79	0.0324	0.5185
17.24	0.0460	0.5999

Shim, Joosup - Kohn, J. P., Multiphase and Volumetric Equilibria of Methane-n-Hexane Binary System at Temperatures Between -110° and 150° C., Journal of Chemical & Engineering Data. 7 (1962) 3-8. doi:10.1021/je60012a002

T / K = 423.15

P / bar	x ₁	y ₁	
10.13	0.0110	0.4420	
20.27	0.0464	0.5625	
30.40	0.0826	0.6695	
40.53	0.1187	0.7220	
50.66	0.1553	0.7520	
60.80	0.1915	0.7675	
70.93	0.2278	0.7780	
81.06	0.2645	0.7800	
91.19	0.3040	0.7600	
101.33	0.3440	0.7380	
121.59	0.6250	0.6250	CRIT

Poston, R. S. - McKetta, J. J., Vapor-Liquid Equilibrium in the Methane-n-Hexane System., Journal of Chemical & Engineering Data. 11 (1966) 362-363. doi:10.1021/je60030a021

T / K = 444.25

P / bar	x ₁	y ₁
25.09	0.0520	0.4380
34.46	0.0790	0.5220
68.93	0.2080	0.6540

NA-NA systems (BAC = 1)

103.39 0.3630 0.6600
 108.56 0.3880 0.6580
 112.56 0.4220 0.6410

$h^M / \text{J.mol}^{-1}$ z_1
 54.20 0.3660
 54.60 0.3800
 56.50 0.4130
 57.00 0.4640
 57.00 0.5390
 55.30 0.5680
 50.90 0.6240
 44.50 0.7250

Enthalpy of mixing

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 343.20

P / bar = 1.013

$h^M / \text{J.mol}^{-1}$ z_1
 83.70 0.3040
 91.40 0.3550
 94.20 0.4210
 99.30 0.4560
 96.80 0.4780
 98.20 0.5330
 94.30 0.5950
 82.40 0.6840
 72.30 0.7500
 56.30 0.8220

Three-phase line

Elliott, D.G. - Lin, Y.N. - Chu, T.C. - Chappellear, P.S. - Kobayashi, R., K-values for the methane - n-butane, methane - n-pentane, and methane - n-hexane systems, GPA Research Report. (1976) 1-19.

T / K	P / bar	x_1^a	x_1^b	y_1
186.23	38.54	0.8057	0.9505	0.9998
193.15	47.71	0.7239	0.9864	0.9994

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 363.20

P / bar = 1.013

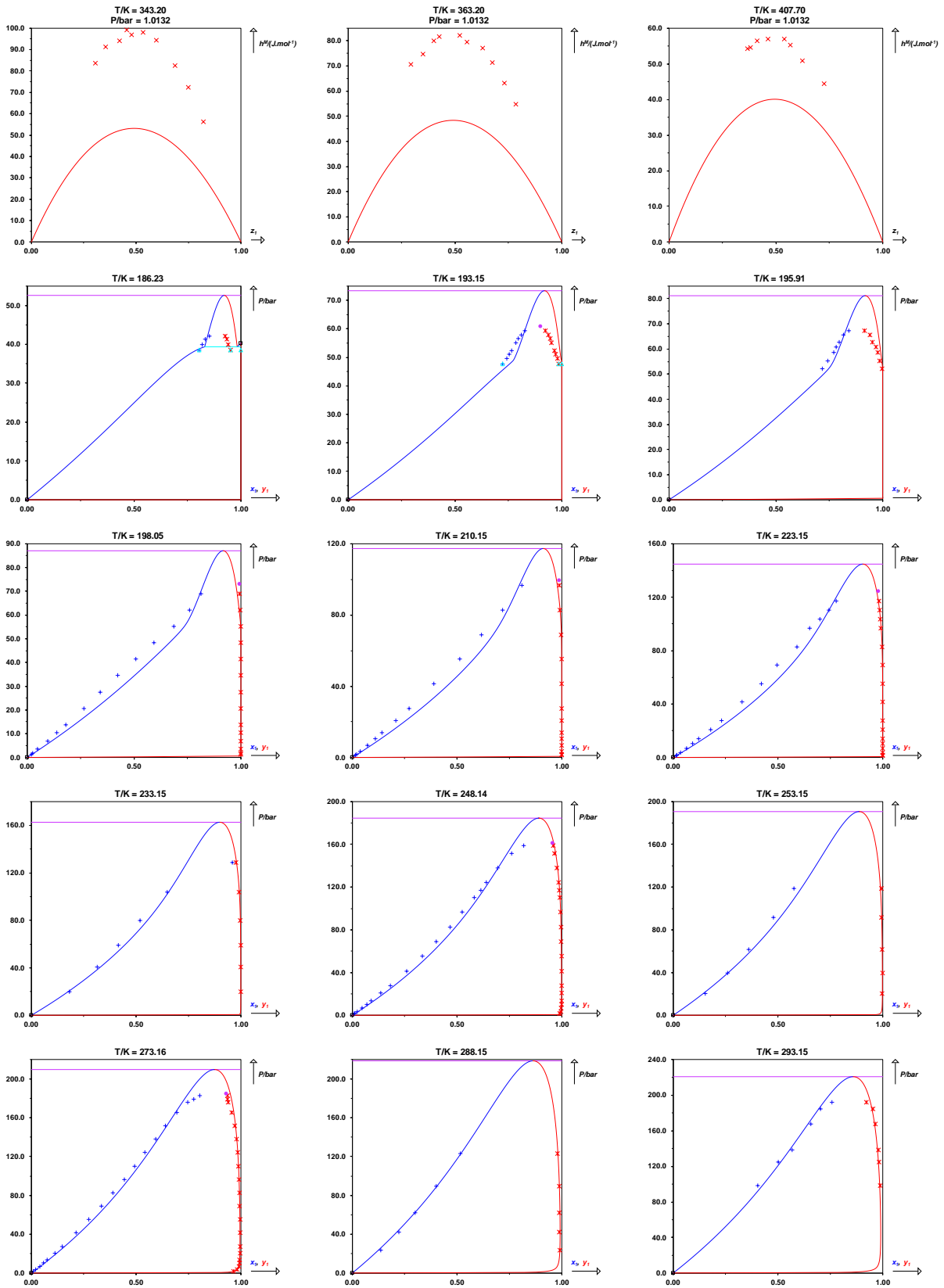
$h^M / \text{J.mol}^{-1}$ z_1
 70.70 0.2940
 74.60 0.3500
 80.00 0.4010
 81.60 0.4250
 82.10 0.5210
 79.40 0.5560
 77.00 0.6300
 71.40 0.6750
 63.20 0.7300
 54.80 0.7840

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

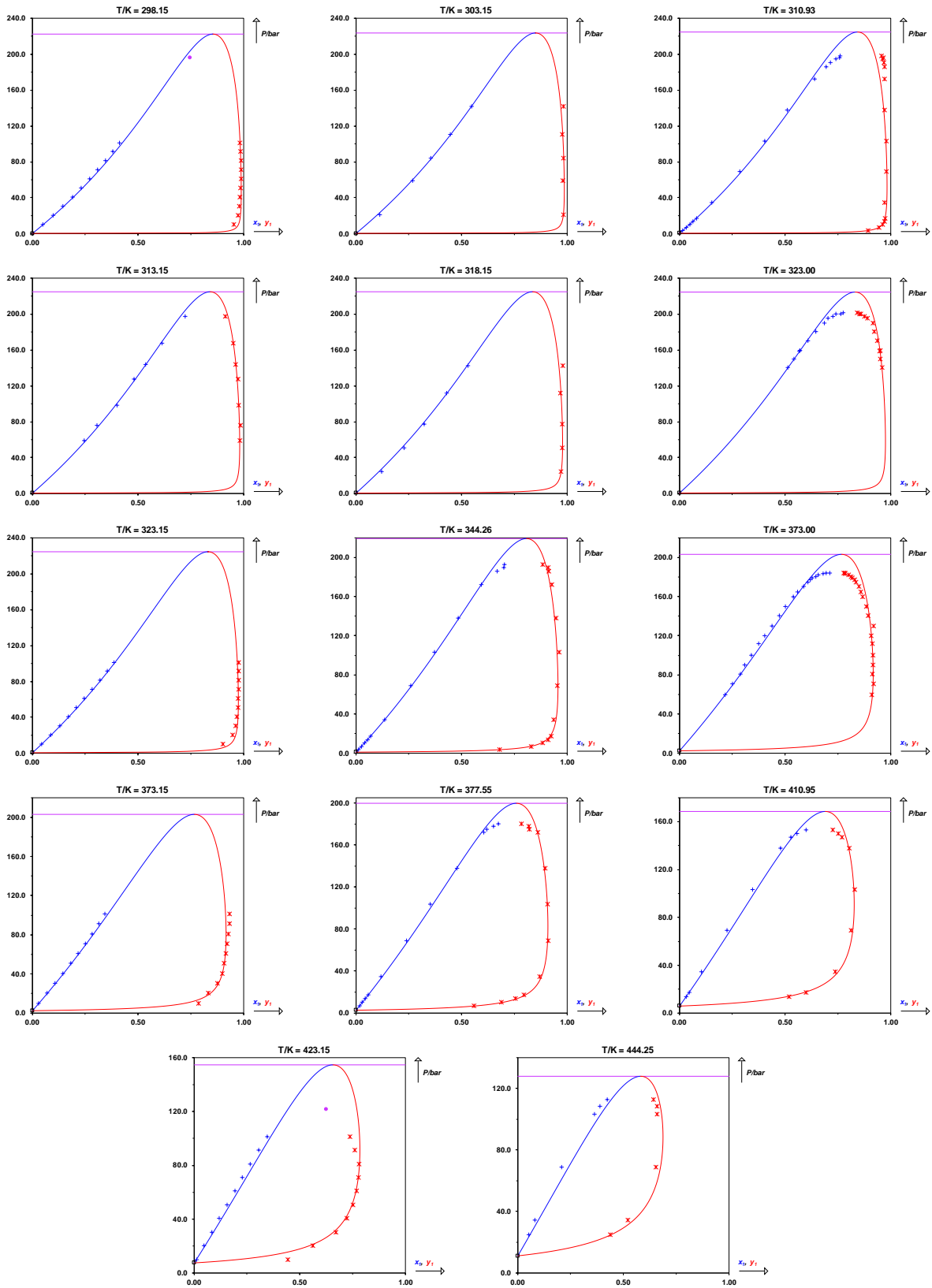
T / K = 407.70

P / bar = 1.013

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



METHANE (1) + n-HEPTANE (2)

CAS	74-82-8	142-82-5
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	IMNFDUFMRHMDMM-UHFFFAOYSA-N
T_c / K	190.56	540.20
P_c / bar	45.99	27.40
ω	0.012	0.349

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 11.90$

$B/\text{MPa} = 52.26$

Deviations

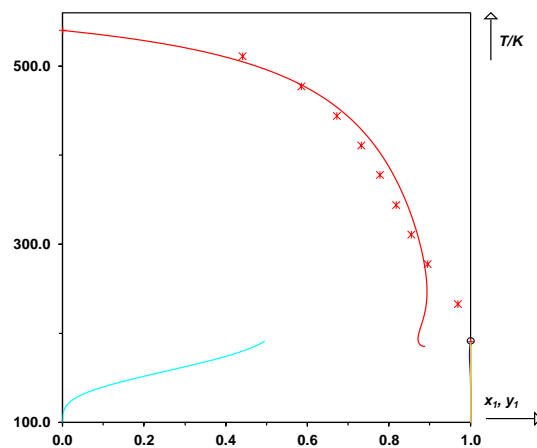
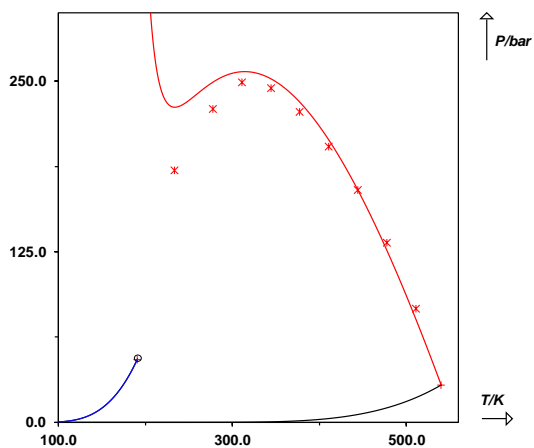
MAPE on $x = 7.5\%$

MAPE on $y = 10\%$

MAPE on $x_c = 20\%$

MAPE on $P_c = 6.5\%$

MAPE on $h^M = 21\%$



-----			103.42	0.5789	0.9987
Isothermal phase equilibrium data			120.66	0.6549	0.9982
-----			137.90	0.7375	0.9975
Chang, Harry L. - Hurt, Lewis J. - Kobayashi, Riki, Vapor-liquid equilibria of light hydrocarbons at low temperatures and high pressures: The methane-n-heptane system, AIChE Journal. 12 (1966) 1212-1216. doi:10.1002/aic.690120629			155.13	0.8150	0.9960
T / K = 210.93			172.37	0.8880	0.9920
P / bar	x ₁	y ₁	Chang, Harry L. - Hurt, Lewis J. - Kobayashi, Riki, Vapor-liquid equilibria of light hydrocarbons at low temperatures and high pressures: The methane-n-heptane system, AIChE Journal. 12 (1966) 1212-1216. doi:10.1002/aic.690120629		
27.58	0.2630	0.9999	T / K = 244.26		
41.37	0.3780	0.9999	P / bar	x ₁	y ₁
55.16	0.4765	0.9999	6.895	0.0490	0.9994
68.95	0.5549	0.9998	13.79	0.1033	0.9994
86.19	0.6480	0.9997	27.58	0.1883	0.9993
103.42	0.7210	0.9996	41.37	0.2668	0.9992
120.66	0.8030	0.9992	55.16	0.3412	0.9991
137.90	0.8911	0.9986	68.95	0.4078	0.9989
Chang, Harry L. - Hurt, Lewis J. - Kobayashi, Riki, Vapor-liquid equilibria of light hydrocarbons at low temperatures and high pressures: The methane-n-heptane system, AIChE Journal. 12 (1966) 1212-1216. doi:10.1002/aic.690120629			86.19	0.4784	0.9985
T / K = 222.04			103.42	0.5389	0.9979
P / bar	x ₁	y ₁	120.66	0.6058	0.9971
6.895	0.0628	0.9999	137.90	0.6658	0.9960
13.79	0.1235	0.9999	155.13	0.7219	0.9930
27.58	0.2322	0.9999	172.37	0.7813	0.9883
41.37	0.3255	0.9998	189.61	0.8634	0.9756
55.16	0.4117	0.9997	Chang, Harry L. - Hurt, Lewis J. - Kobayashi, Riki, Vapor-liquid equilibria of light hydrocarbons at low temperatures and high pressures: The methane-n-heptane system, AIChE Journal. 12 (1966) 1212-1216. doi:10.1002/aic.690120629		
68.95	0.4921	0.9996	T / K = 255.37		
86.19	0.5720	0.9995	P / bar	x ₁	y ₁
103.42	0.6542	0.9993	6.895	0.0445	0.9986
120.66	0.7280	0.9990	13.79	0.0901	0.9988
137.90	0.7949	0.9985	27.58	0.1744	0.9990
155.13	0.8819	0.9966	41.37	0.2490	0.9987
Chang, Harry L. - Hurt, Lewis J. - Kobayashi, Riki, Vapor-liquid equilibria of light hydrocarbons at low temperatures and high pressures: The methane-n-heptane system, AIChE Journal. 12 (1966) 1212-1216. doi:10.1002/aic.690120629			55.16	0.3160	0.9986
T / K = 233.15			68.95	0.3772	0.9984
P / bar	x ₁	y ₁	86.19	0.4452	0.9978
6.895	0.0556	0.9997	103.42	0.4966	0.9964
13.79	0.1163	0.9997	120.66	0.5570	0.9958
27.58	0.2081	0.9997	137.90	0.6169	0.9943
41.37	0.2990	0.9996	155.13	0.6659	0.9927
55.16	0.3728	0.9995	172.37	0.7183	0.9853
68.95	0.4481	0.9993	189.61	0.7789	0.9734
86.19	0.5160	0.9991	206.85	0.8585	0.9400
			Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior		

NA-NA systems (BAC = 1)

of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 277.59

P / bar	x ₁	y ₁	
13.79	0.0753	0.9964	
27.58	0.1445	0.9974	
41.37	0.2084	0.9971	
55.16	0.2670	0.9970	
68.95	0.3215	0.9966	
86.19	0.3840	0.9957	
103.42	0.4410	0.9940	
120.66	0.4930	0.9920	
137.90	0.5425	0.9890	
155.13	0.5900	0.9850	
172.37	0.6373	0.9780	
189.61	0.6870	0.9690	
206.85	0.7400	0.9530	
229.46	0.8940	0.8940	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 310.93

P / bar	x ₁	y ₁	
13.79	0.0640	0.9866	
27.58	0.1240	0.9905	
68.95	0.2842	0.9910	
86.19	0.3425	0.9900	
103.42	0.3963	0.9881	
120.66	0.4470	0.9850	
137.90	0.4950	0.9801	
155.13	0.5435	0.9748	
172.37	0.5905	0.9690	
189.61	0.6400	0.9620	
206.85	0.6910	0.9530	
241.31	0.8030	0.9050	
248.83	0.8550	0.8550	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 344.26

P / bar	x ₁	y ₁
13.79	0.0565	0.9597
27.58	0.1110	0.9733
41.37	0.1623	0.9780

55.16	0.2107	0.9798	
68.95	0.2567	0.9804	
86.19	0.3108	0.9795	
103.42	0.3620	0.9770	
120.66	0.4125	0.9742	
137.90	0.4620	0.9705	
155.13	0.5090	0.9656	
172.37	0.5580	0.9590	
189.61	0.6070	0.9490	
206.85	0.6610	0.9360	
241.31	0.7870	0.8595	
244.70	0.8170	0.8170	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 377.59

P / bar	x ₁	y ₁	
13.79	0.0494	0.8942	
27.58	0.1003	0.9305	
41.37	0.1492	0.9449	
55.16	0.1960	0.9517	
68.95	0.2410	0.9558	
86.19	0.2940	0.9566	
103.42	0.3450	0.9564	
120.66	0.3957	0.9532	
137.90	0.4457	0.9474	
155.13	0.4944	0.9392	
172.37	0.5450	0.9280	
189.61	0.5995	0.9120	
206.85	0.6615	0.8864	
227.39	0.7780	0.7780	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 410.93

P / bar	x ₁	y ₁
13.79	0.0405	0.7481
27.58	0.0918	0.8628
41.37	0.1390	0.8894
55.16	0.1850	0.9037
68.95	0.2290	0.9100
86.19	0.2810	0.9120
103.42	0.3308	0.9107
120.66	0.3810	0.9073
137.90	0.4329	0.9000

NA-NA systems (BAC = 1)

155.13	0.4880	0.8900		83.15	0.4410	0.4410	CRIT
172.37	0.5446	0.8660					
189.61	0.6150	0.8280					
201.81	0.7320	0.7320	CRIT				

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 444.26

P / bar	x ₁	y ₁	
13.79	0.0305	0.5100	
27.58	0.0840	0.7220	
41.37	0.1317	0.7750	
55.16	0.1786	0.8060	
68.95	0.2240	0.8260	
86.19	0.2780	0.8369	
103.42	0.3316	0.8360	
120.66	0.3850	0.8250	
137.90	0.4431	0.8040	
155.13	0.5165	0.7730	
170.23	0.6720	0.6720	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 477.59

P / bar	x ₁	y ₁	
13.79	0.0132	0.2060	
27.58	0.0670	0.5223	
41.37	0.1200	0.6210	
55.16	0.1740	0.6700	
68.95	0.2290	0.6930	
86.19	0.2980	0.6990	
103.42	0.3725	0.6940	
120.66	0.4620	0.6690	
131.41	0.5850	0.5850	CRIT

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Methane- n-Heptane System, Industrial & Engineering Chemistry Chemical & Engineering Data Series. 1 (1956) 29-42. doi:10.1021/i460001a007

T / K = 510.93

P / bar	x ₁	y ₁	
27.58	0.0485	0.2640	
41.37	0.1205	0.4199	
55.16	0.1918	0.4670	
68.95	0.2730	0.4750	

Enthalpy of mixing

Oscarson, J.L. - Coxam, J.Y. - Gillespie, S.E. - Izatt, R.M., Excess enthalpies of mixing methane with methanol, n-heptane, toluene and methylcyclohexane at 255.4 and 310.9 K and 13.8 MPa, Fluid Phase Equilibria. 114 (1996) 161-174. doi:10.1016/0378-3812(95)02813-7

T / K = 255.40

P / bar = 138.00

h ^M / J.mol ⁻¹	z ₁
-2.000	0.0226
-44.00	0.0545
-101.00	0.1014
-147.00	0.1475
-236.00	0.2051
-295.00	0.2507
-307.00	0.2530
-369.00	0.3073
-352.00	0.3076
-454.00	0.3542
-483.00	0.4070
-559.00	0.4464
-637.00	0.5020
-691.00	0.5478
-729.00	0.6019

Oscarson, J.L. - Coxam, J.Y. - Gillespie, S.E. - Izatt, R.M., Excess enthalpies of mixing methane with methanol, n-heptane, toluene and methylcyclohexane at 255.4 and 310.9 K and 13.8 MPa, Fluid Phase Equilibria. 114 (1996) 161-174. doi:10.1016/0378-3812(95)02813-7

T / K = 310.90

P / bar = 138.00

h ^M / J.mol ⁻¹	z ₁
-25.00	0.0196
-53.00	0.0384
-109.00	0.0736
-112.00	0.0739
-162.00	0.1065
-198.00	0.1226
-216.00	0.1372
-257.00	0.1664
-309.00	0.1926
-354.00	0.2184
-396.00	0.2421
-430.00	0.2643
-451.00	0.2844
-499.00	0.3229

-557.00	0.3585
-577.00	0.3887
-618.00	0.4181
-656.00	0.4429

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 389.20

P / bar = 1.013

$h^M / \text{J.mol}^{-1}$	z_1
98.70	0.3690
105.10	0.5240
101.90	0.5870
92.40	0.6610
68.90	0.7920

Hutchings, D.J. - Lewis, E.J. - Wormald, C.J., Excess enthalpies of mixtures of methane + each of the n-alkanes from ethane to n-octane, The Journal of Chemical Thermodynamics. 10 (1978) 559-566. doi:10.1016/0021-9614(78)90044-7

T / K = 405.70

P / bar = 1.013

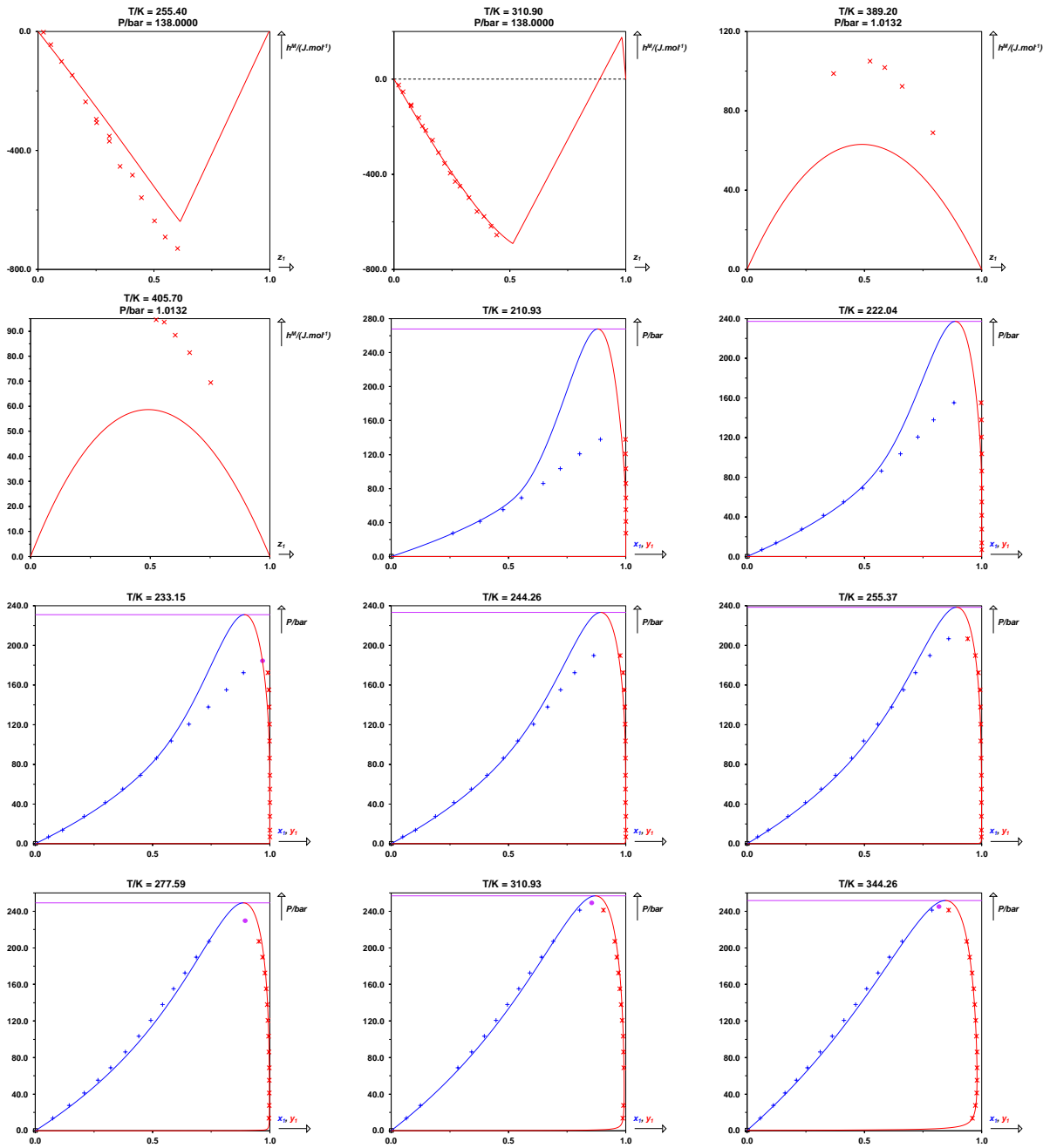
$h^M / \text{J.mol}^{-1}$	z_1
94.60	0.5240
93.60	0.5580
88.40	0.6050
81.40	0.6640
69.50	0.7530

Critical point

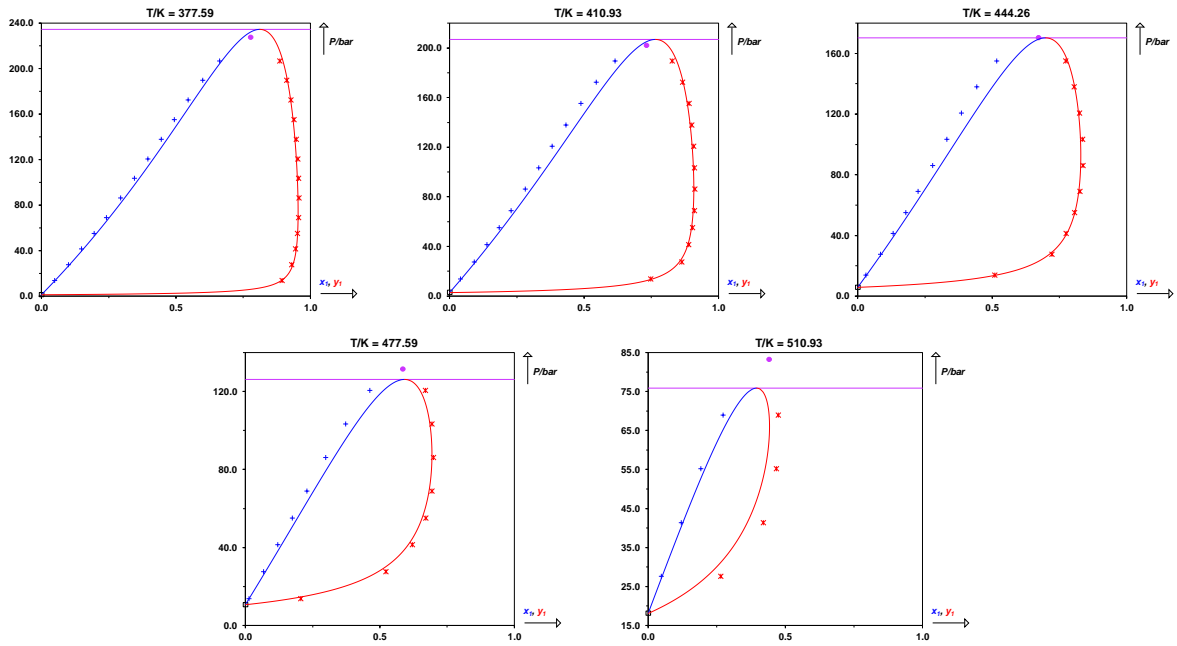
Chen, R.J.J. - Chappellear, P.S. - Kobayashi, R., Vapor Phase Data for the Binary Systems of Methane with n-Butane, n-Pentane, n-Hexane, and n-Heptane, GPA Research Report. (1976) 1-14.

T / K	P / bar	x_1
233.15	184.43	0.9690

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



METHANE (1) + n-DECANE (2)

CAS	74-82-8	124-18-5
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	DIOQZVSQGTUSAI-UHFFFAOYSA-N
T_c / K	190.56	617.70
P_c / bar	45.99	21.10
ω	0.012	0.492

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 24.58

B/MPa = 53.44

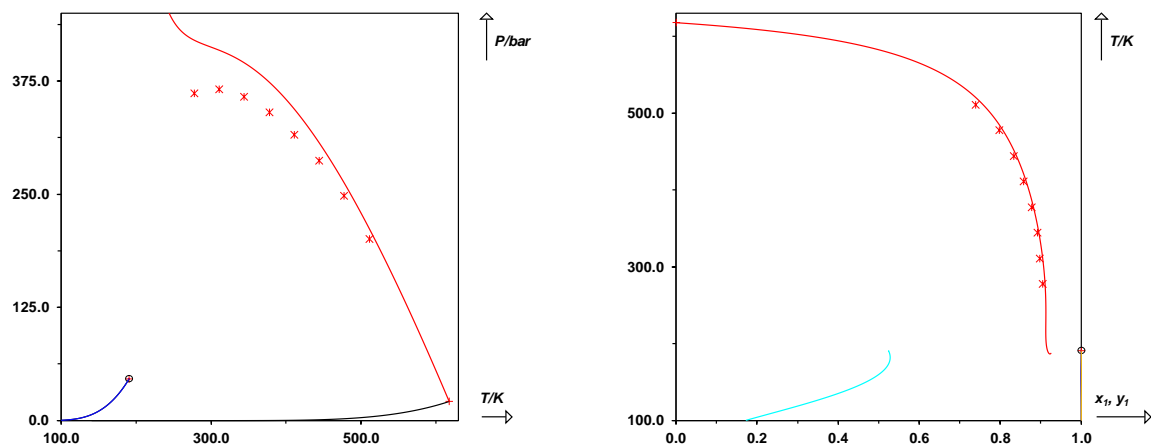
Deviations

MAPE on x = 2.8 %

MAPE on y = 7.2 %

MAPE on x_c = 3.1 %

MAPE on P_c = 9.4 %



Isothermal phase equilibrium data

Koonce, K. T. - Kobayashi, Riki., A Method for Determining the Solubility of Gases in Relatively Nonvolatile Liquids: Solubility of Methane in n-Decane., Journal of Chemical & Engineering Data. 9 (1964) 490-494. doi:10.1021/je60023a004

T / K = 244.26

P / bar	x ₁	y ₁
16.00	0.1103	0.9990
21.19	0.1453	0.9997
31.88	0.2061	0.9996

Koonce, K. T. - Kobayashi, Riki., A Method for Determining the Solubility of Gases in Relatively Nonvolatile Liquids: Solubility of Methane in n-Decane., Journal of Chemical & Engineering Data. 9 (1964) 490-494. doi:10.1021/je60023a004

T / K = 255.37

P / bar	x ₁	y ₁
15.65	0.0982	0.9997
22.02	0.1356	0.9994
29.93	0.1783	0.9990
41.69	0.2402	0.9992
63.19	0.3248	0.9994

Koonce, K. T. - Kobayashi, Riki., A Method for Determining the Solubility of Gases in Relatively Nonvolatile Liquids: Solubility of Methane in n-Decane., Journal of Chemical & Engineering Data. 9 (1964) 490-494. doi:10.1021/je60023a004

T / K = 266.48

P / bar	x ₁	y ₁
46.28	0.2433	1.0000
66.87	0.3185	0.9990

Koonce, K. T. - Kobayashi, Riki., A Method for Determining the Solubility of Gases in Relatively Nonvolatile Liquids: Solubility of Methane in n-Decane., Journal of Chemical & Engineering Data. 9 (1964) 490-494. doi:10.1021/je60023a004

T / K = 277.59

P / bar	x ₁	y ₁
17.34	0.0947	0.9991
22.66	0.1243	0.9994
28.27	0.1498	0.9992
37.70	0.1923	1.0000
52.19	0.2525	0.9999
63.83	0.2901	0.9990

Lentz, H. - Nuennerich, P., Die Bestimmung der Zusammensetzung koexistierender Phasen binärer

Mischungen aus Nodenlinien und Volumen, Chem. Ing. Tech. 73 (2001) 1162-1164. doi:10.1002/1522-2640(200109)73:9<1162::AID-CITE1162>3.0.CO;2-4

T / K = 300.00

P / bar	x ₁	y ₁
150.00	0.4910	0.9984
200.00	0.5720	0.9957
250.00	0.6550	0.9914
300.00	0.7250	0.9790

Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 34 (1942) 1526-1531. doi:10.1021/ie50396a025

T / K = 310.93

P / bar	x ₁	y ₁	
1.379	0.0070	0.9961	
2.758	0.0141	0.9979	
4.137	0.0210	0.9985	
5.516	0.0278	0.9988	
6.895	0.0345	0.9990	
13.79	0.0666	0.9993	
27.58	0.1251	0.9994	
41.37	0.1773	0.9994	
55.16	0.2243	0.9994	
68.95	0.2679	0.9993	
86.19	0.3178	0.9991	
103.42	0.3637	0.9989	
120.66	0.4069	0.9986	
137.90	0.4469	0.9981	
155.13	0.4842	0.9974	
172.37	0.5183	0.9965	
189.61	0.5507	0.9955	
206.85	0.5827	0.9942	
224.07	0.6111	0.9926	
241.31	0.6370	0.9906	
258.55	0.6629	0.9877	
275.79	0.6870	0.9837	
293.03	0.7124	0.9788	
310.27	0.7378	0.9721	
327.51	0.7682	0.9636	
344.74	0.8064	0.9514	
361.98	0.8609	0.9276	
366.11	0.8979	0.8979	CRIT

Lavender, H.M. - Sage, B.H. - Lacey, W.N., Gas-liquid equilibrium constants, methane-decane system, Oil Gas J. 39 (1940) 48-49.

T / K = 310.93

P / bar	x ₁	y ₁
1.014	0.0052	0.9952

NA-NA systems (BAC = 1)

3.447	0.0176	0.9985	34.47	0.1399	0.9988
6.895	0.0347	0.9992	51.71	0.1937	0.9989
17.24	0.0830	0.9996	68.95	0.2387	0.9988
68.95	0.2576	0.9996	86.18	0.2815	0.9987
86.18	0.3021	0.9995	103.42	0.3240	0.9983
103.42	0.3489	0.9994	120.66	0.3662	0.9979
120.66	0.3940	0.9992	137.90	0.4087	0.9976
137.90	0.4379	0.9990			

Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 34 (1942) 1526-1531. doi:10.1021/ie50396a025

T / K = 344.26

P / bar	x ₁	y ₁	
1.379	0.0062	0.9792	
2.758	0.0125	0.9891	
4.137	0.0186	0.9924	
5.516	0.0247	0.9940	
6.895	0.0308	0.9950	
13.79	0.0600	0.9970	
27.58	0.1139	0.9980	
68.95	0.2496	0.9980	
86.19	0.2983	0.9977	
103.42	0.3429	0.9973	
120.66	0.3847	0.9969	
137.90	0.4234	0.9963	
155.13	0.4596	0.9956	
172.37	0.4943	0.9945	
189.61	0.5272	0.9932	
206.85	0.5593	0.9915	
224.07	0.5908	0.9892	
241.31	0.6202	0.9863	
258.55	0.6498	0.9826	
275.79	0.6796	0.9779	
293.03	0.7107	0.9721	
310.27	0.7441	0.9647	
327.51	0.7795	0.9541	
344.74	0.8240	0.9364	
357.70	0.8911	0.8911	CRIT

Lavender, H.M. - Sage, B.H. - Lacey, W.N., Gas-liquid equilibrium constants, methane-decane system, Oil Gas J. 39 (1940) 48-49.

T / K = 344.26

P / bar	x ₁	y ₁
1.014	0.0046	0.9724
3.447	0.0157	0.9916
6.895	0.0312	0.9957
17.24	0.0749	0.9980

Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 34 (1942) 1526-1531. doi:10.1021/ie50396a025

T / K = 377.59

P / bar	x ₁	y ₁	
1.379	0.0052	0.9172	
2.758	0.0109	0.9570	
4.137	0.0165	0.9703	
5.516	0.0220	0.9769	
6.895	0.0275	0.9811	
13.79	0.0543	0.9890	
27.58	0.1045	0.9931	
41.37	0.1510	0.9942	
55.16	0.1945	0.9945	
68.95	0.2352	0.9947	
86.19	0.2825	0.9945	
103.42	0.3275	0.9941	
120.66	0.3700	0.9933	
137.90	0.4091	0.9921	
155.13	0.4460	0.9907	
172.37	0.4804	0.9889	
189.61	0.5139	0.9867	
206.85	0.5462	0.9841	
224.07	0.5795	0.9809	
241.31	0.6124	0.9770	
258.55	0.6442	0.9716	
275.79	0.6782	0.9657	
293.03	0.7150	0.9576	
310.27	0.7550	0.9467	
327.51	0.8064	0.9273	
340.26	0.8767	0.8767	CRIT

Lavender, H.M. - Sage, B.H. - Lacey, W.N., Gas-liquid equilibrium constants, methane-decane system, Oil Gas J. 39 (1940) 48-49.

T / K = 377.59

P / bar	x ₁	y ₁
1.014	0.0038	0.8830
3.447	0.0141	0.9654
6.895	0.0283	0.9822
17.24	0.0689	0.9927

NA-NA systems (BAC = 1)

34.47	0.1299	0.9954		27.58	0.0932	0.9511	
51.71	0.1804	0.9960		41.37	0.1380	0.9627	
68.95	0.2228	0.9960		55.16	0.1807	0.9673	
86.18	0.2643	0.9957		68.95	0.2213	0.9692	
103.42	0.3064	0.9952		86.19	0.2698	0.9702	
120.66	0.3485	0.9937		103.42	0.3163	0.9699	
137.90	0.3906	0.9937		120.66	0.3605	0.9683	
				137.90	0.4025	0.9656	
Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 34 (1942) 1526-1531. doi:10.1021/ie50396a025				155.13	0.4434	0.9622	
T / K = 410.93				172.37	0.4827	0.9580	
P / bar	x_1	y_1		189.61	0.5224	0.9536	
1.379	0.0039	0.7384		206.85	0.5607	0.9477	
2.758	0.0092	0.8654		224.07	0.6005	0.9401	
4.137	0.0143	0.9073		241.31	0.6435	0.9326	
5.516	0.0194	0.9282		258.55	0.6831	0.9125	
6.895	0.0245	0.9411		275.79	0.7358	0.8823	
13.79	0.0496	0.9665		287.03	0.8333	0.8333	CRIT
27.58	0.0974	0.9798		Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 34 (1942) 1526-1531. doi:10.1021/ie50396a025			
41.37	0.1425	0.9842		T / K = 477.59			
55.16	0.1852	0.9862		P / bar	x_1	y_1	
68.95	0.2256	0.9870		2.758	0.0023	0.2124	
86.19	0.2738	0.9874		4.137	0.0075	0.4645	
103.42	0.3191	0.9870		5.516	0.0127	0.5906	
120.66	0.3623	0.9859		6.895	0.0179	0.6662	
137.90	0.4027	0.9845		13.79	0.0439	0.8160	
155.13	0.4411	0.9819		27.58	0.0926	0.8940	
172.37	0.4779	0.9787		41.37	0.1390	0.9189	
206.85	0.5476	0.9715		55.16	0.1835	0.9306	
224.07	0.5827	0.9669		68.95	0.2258	0.9357	
241.31	0.6168	0.9608		86.19	0.2758	0.9381	
258.55	0.6523	0.9531		103.42	0.3234	0.9389	
275.79	0.6912	0.9430		120.66	0.3678	0.9379	
293.03	0.7369	0.9279		137.90	0.4119	0.9351	
310.27	0.8009	0.8950		155.13	0.4555	0.9301	
315.78	0.8574	0.8574	CRIT	172.37	0.4983	0.9227	
Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 34 (1942) 1526-1531. doi:10.1021/ie50396a025				189.61	0.5427	0.9136	
T / K = 444.26				206.85	0.5912	0.9030	
P / bar	x_1	y_1		224.07	0.6467	0.8848	
1.379	0.0017	0.3187		241.31	0.7214	0.8517	
2.758	0.0067	0.6493		248.56	0.7979	0.7979	CRIT
4.137	0.0117	0.7594		Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems, Industrial & Engineering Chemistry. 34 (1942) 1526-1531. doi:10.1021/ie50396a025			
5.516	0.0167	0.8154		T / K = 510.93			
6.895	0.0217	0.8489		P / bar	x_1	y_1	
13.79	0.0460	0.9150					

5.516	0.0046	0.1828	
6.895	0.0104	0.3335	
13.79	0.0392	0.6409	
27.58	0.0937	0.7929	
41.37	0.1452	0.8468	
55.16	0.1933	0.8700	
68.95	0.2378	0.8802	
86.19	0.2895	0.8858	
103.42	0.3374	0.8872	
120.66	0.3837	0.8861	
137.90	0.4280	0.8813	
155.13	0.4763	0.8713	
172.37	0.5379	0.8533	
189.61	0.6157	0.8204	
200.71	0.7390	0.7390	CRIT

Lin, Ho-Mu - Sebastian, Herbert M. - Simnick, James J. - Chao, Kwang-Chu, Gas-liquid equilibrium in binary mixtures of methane with N-decane, benzene, and toluene, Journal of Chemical & Engineering Data. 24 (1979) 146-149. doi:10.1021/je60081a004

T / K = 542.75

P / bar	x_1	y_1
30.50	0.0946	0.6795
50.98	0.1706	0.7638
101.38	0.3508	0.8051
126.68	0.4440	0.7901
151.43	0.6682	0.7116

Lin, Ho-Mu - Sebastian, Herbert M. - Simnick, James J. - Chao, Kwang-Chu, Gas-liquid equilibrium in binary mixtures of methane with N-decane, benzene, and toluene, Journal of Chemical & Engineering Data. 24 (1979) 146-149. doi:10.1021/je60081a004

T / K = 563.25

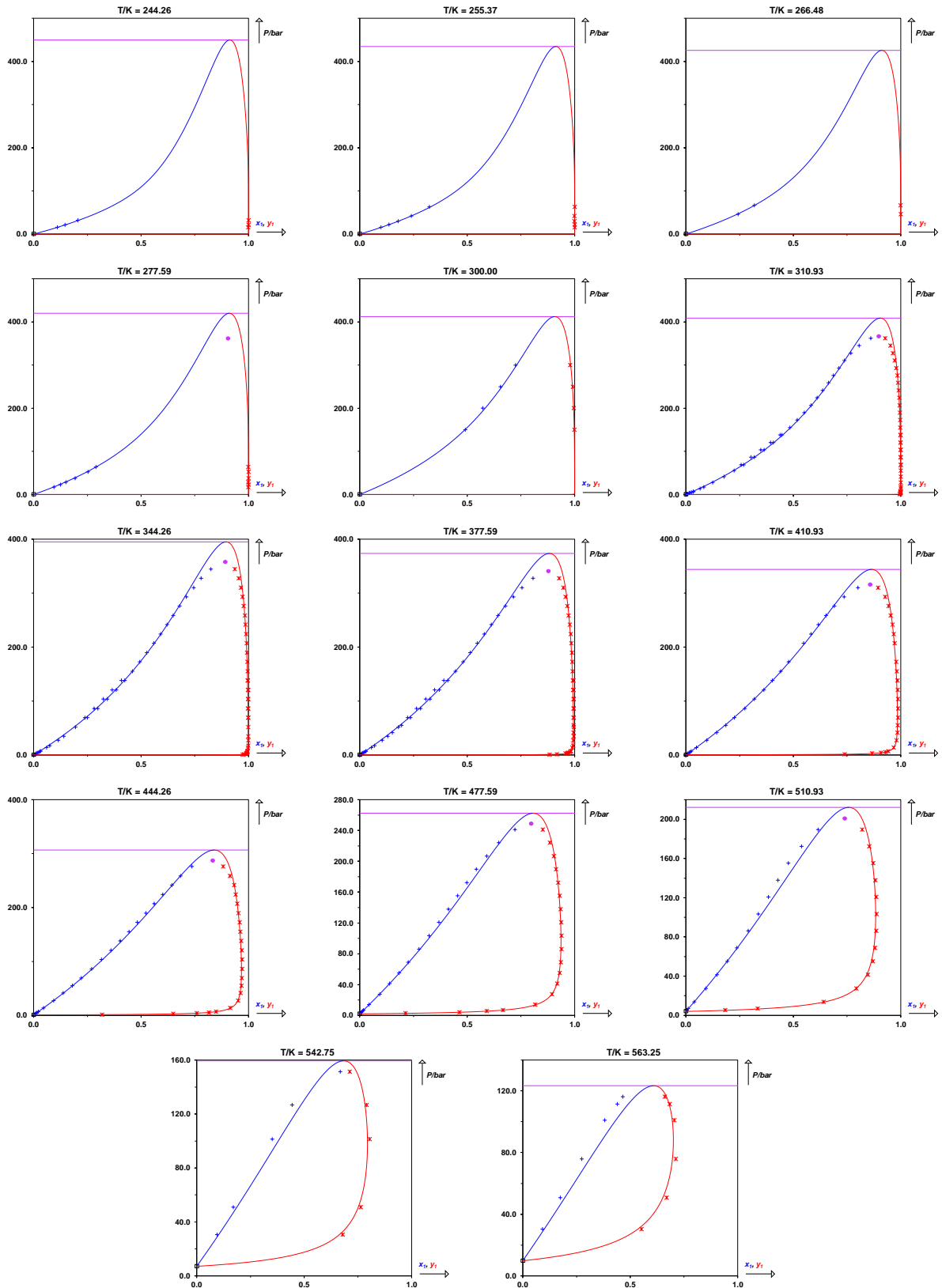
P / bar	x_1	y_1
30.37	0.0911	0.5528
50.70	0.1744	0.6690
75.87	0.2744	0.7118
100.97	0.3817	0.7055
111.45	0.4399	0.6835
116.14	0.4652	0.6604

Critical point

Wiese, H. C. - Reamer, H. H. - Sage, B. H., Phase equilibria in hydrocarbon systems. Phase behavior in the methane-propane-n-decane system, Journal of Chemical & Engineering Data. 15 (1970) 75-82. doi:10.1021/je60044a018

T / K	P / bar	x_1
277.59	361.29	0.9050

NA-NA systems (BAC = 1)



METHANE (1) + n-TETRACOSANE (2)

CAS	74-82-8	646-31-1
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	POOSGDOYLQNASK-UHFFFAOYSA-N
T_c / K	190.56	804.00
P_c / bar	45.99	9.80
ω	0.012	1.071

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

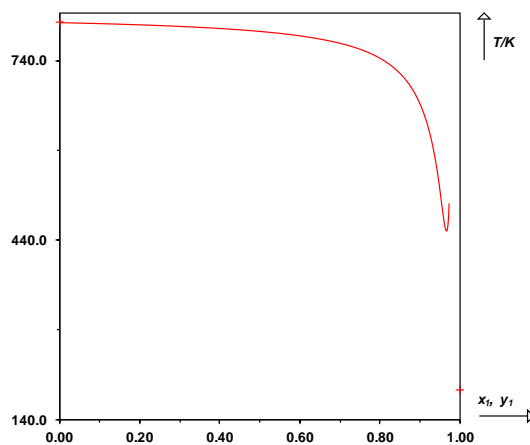
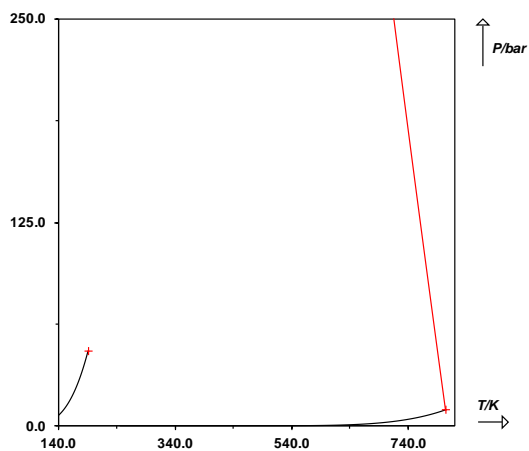
$A/\text{MPa} = 31.91$

$B/\text{MPa} = 62.82$

Deviations

MAPE on $x = 9.1\%$

MAPE on $y = 15\%$



NA-NA systems (BAC = 1)

-----	927.30	0.9690	
Isothermal phase equilibrium data	940.10	0.9680	
-----	929.10	0.9670	
Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High pressure solid-fluid and vapour-liquid equilibria in the system (methane + tetracosane), Fluid Phase Equilibria. 127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-3	935.60	0.9600	
T / K = 325.00			Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High pressure solid-fluid and vapour-liquid equilibria in the system (methane + tetracosane), Fluid Phase Equilibria. 127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-3
P / bar y_1			T / K = 350.00
656.80 0.9970			P / bar x_1
913.30 0.9900			947.10 0.9570
1007.8 0.9810			935.60 0.9520
1019.7 0.9680			934.90 0.9510
1029.6 0.9670			931.30 0.9440
			929.30 0.9410
			901.50 0.9210
			782.30 0.8730
			662.50 0.8330
			573.60 0.8020
			376.60 0.7080
			240.30 0.5980
			197.20 0.5490
			166.00 0.5050
			161.60 0.4980
			110.00 0.4020
			87.30 0.3490
			74.70 0.3140
			54.30 0.2490
			43.10 0.2060
			20.40 0.1080
			Huang, Chen-Pao - Jan, Dong-Syau - Tsai, Fuan-Nan, Modeling of Methane Solubility in Heavy n-Paraffins., JOURNAL OF CHEMICAL ENGINEERING OF JAPAN. 25 (1992) 182-186. doi:10.1252/jcej.25.182
			T / K = 373.15
			P / bar x_1
			10.10 0.0501
			20.30 0.0981
			30.40 0.1425
			40.50 0.1850
			50.70 0.2191
			Arnaud, J.F - Ungerer, P - Behar, E - Moracchini, G - Sanchez, J, Excess volumes and saturation pressures for the system methane + n-tetracosane at 374 K. Representation by improved EOS mixing rules, Fluid Phase Equilibria. 124 (1996) 177-207. doi:10.1016/S0378-3812(96)03101-9
			T / K = 374.00
Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High pressure solid-fluid and vapour-liquid equilibria in the system (methane + tetracosane), Fluid Phase Equilibria. 127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-3			
T / K = 350.00			
P / bar y_1			
601.40 0.9970			
783.20 0.9920			
866.20 0.9870			
923.10 0.9750			

NA-NA systems (BAC = 1)

P / bar	x_1	y_1
201.00	0.5475	0.9996
300.50	0.6502	0.9997
400.00	0.7234	0.9992
500.00	0.7775	0.9976
550.80	0.8025	0.9968
601.70	0.8254	0.9962
701.40	0.8639	0.9854
801.20	0.9035	0.9854
843.00	0.9283	0.9748

Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High pressure solid-fluid and vapour-liquid equilibria in the system (methane + tetracosane), Fluid Phase Equilibria. 127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-3

T / K = 374.00

P / bar	y_1
552.60	0.9970
721.20	0.9920
799.30	0.9870
856.50	0.9750
855.50	0.9690
869.50	0.9680
868.10	0.9600

Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High pressure solid-fluid and vapour-liquid equilibria in the system (methane + tetracosane), Fluid Phase Equilibria. 127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-3

T / K = 374.00

P / bar	x_1
875.90	0.9570
864.30	0.9520
866.70	0.9510
865.50	0.9440
862.50	0.9410
842.20	0.9210
740.10	0.8730
632.80	0.8330
554.00	0.8020
371.90	0.7080
242.30	0.5980
172.00	0.5050
113.60	0.4020
77.70	0.3140
45.10	0.2060
21.40	0.1080

Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High pressure solid-fluid and vapour-liquid equilibria in the system (methane + tetracosane), Fluid Phase Equilibria. 127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-3

T / K = 400.00

P / bar	y_1
504.20	0.9970
659.70	0.9920
732.70	0.9870
789.70	0.9750
783.90	0.9690
799.00	0.9680
800.50	0.9600

Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High pressure solid-fluid and vapour-liquid equilibria in the system (methane + tetracosane), Fluid Phase Equilibria. 127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-3

T / K = 400.00

P / bar	x_1
804.80	0.9570
793.10	0.9520
798.40	0.9510
799.50	0.9440
795.50	0.9410
782.40	0.9210
696.90	0.8730
602.10	0.8330
533.50	0.8020
366.90	0.7080
244.50	0.5980
117.70	0.4020
81.20	0.3140
47.40	0.2060
22.50	0.1080

Huang, Chen-Pao - Jan, Dong-Syau - Tsai, Fuan-Nan, Modeling of Methane Solubility in Heavy n-Paraffins., JOURNAL OF CHEMICAL ENGINEERING OF JAPAN. 25 (1992) 182-186. doi:10.1252/jcej.25.182

T / K = 423.15

P / bar	x_1
10.10	0.0470
20.30	0.0929
30.40	0.1355
40.50	0.1754
50.70	0.2120

Suleiman, David - Eckert, Charles A., Phase Equilibria of Alkanes in Natural Gas Systems. 1. Alkanes in Methane,

NA-NA systems (BAC = 1)

Journal of Chemical & Engineering Data. 40 (1995) 2-11.
doi:10.1021/je00017a001

T / K = 423.20

P / bar x_1
120.00 0.9998
140.00 0.9998
160.00 0.9998
180.00 0.9997
200.00 0.9995
240.00 0.9988

10.10 0.0464
20.30 0.0909
30.40 0.1349
40.50 0.1737
50.70 0.2102

Huang, Chen-Pao - Jan, Dong-Syau - Tsai, Fuan-Nan,
Modeling of Methane Solubility in Heavy n-Paraffins.,
JOURNAL OF CHEMICAL ENGINEERING OF JAPAN. 25
(1992) 182-186. doi:10.1252/jcej.25.182

T / K = 523.15

P / bar x_1 y_1
10.10 0.0449 0.9978
20.30 0.0885 0.9987
30.40 0.1309 0.9990
40.50 0.1710 0.9991
50.70 0.2054 0.9994

Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High
pressure solid-fluid and vapour-liquid equilibria in the
system (methane + tetracosane), Fluid Phase Equilibria.
127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-
3

T / K = 425.00

P / bar y_1
605.40 0.9920
673.90 0.9870
730.50 0.9750
736.60 0.9680
740.50 0.9600

Huang, Chen-Pao - Jan, Dong-Syau - Tsai, Fuan-Nan,
Modeling of Methane Solubility in Heavy n-Paraffins.,
JOURNAL OF CHEMICAL ENGINEERING OF JAPAN. 25
(1992) 182-186. doi:10.1252/jcej.25.182

T / K = 573.15

P / bar x_1 y_1
10.10 0.0466 0.9903
20.30 0.0921 0.9939
30.40 0.1353 0.9955
40.50 0.1765 0.9961
50.70 0.2149 0.9968

Flöter, E. - de Loos, Th.W. - de Swaan Arons, J., High
pressure solid-fluid and vapour-liquid equilibria in the
system (methane + tetracosane), Fluid Phase Equilibria.
127 (1997) 129-146. doi:10.1016/S0378-3812(96)03157-
3

T / K = 425.00

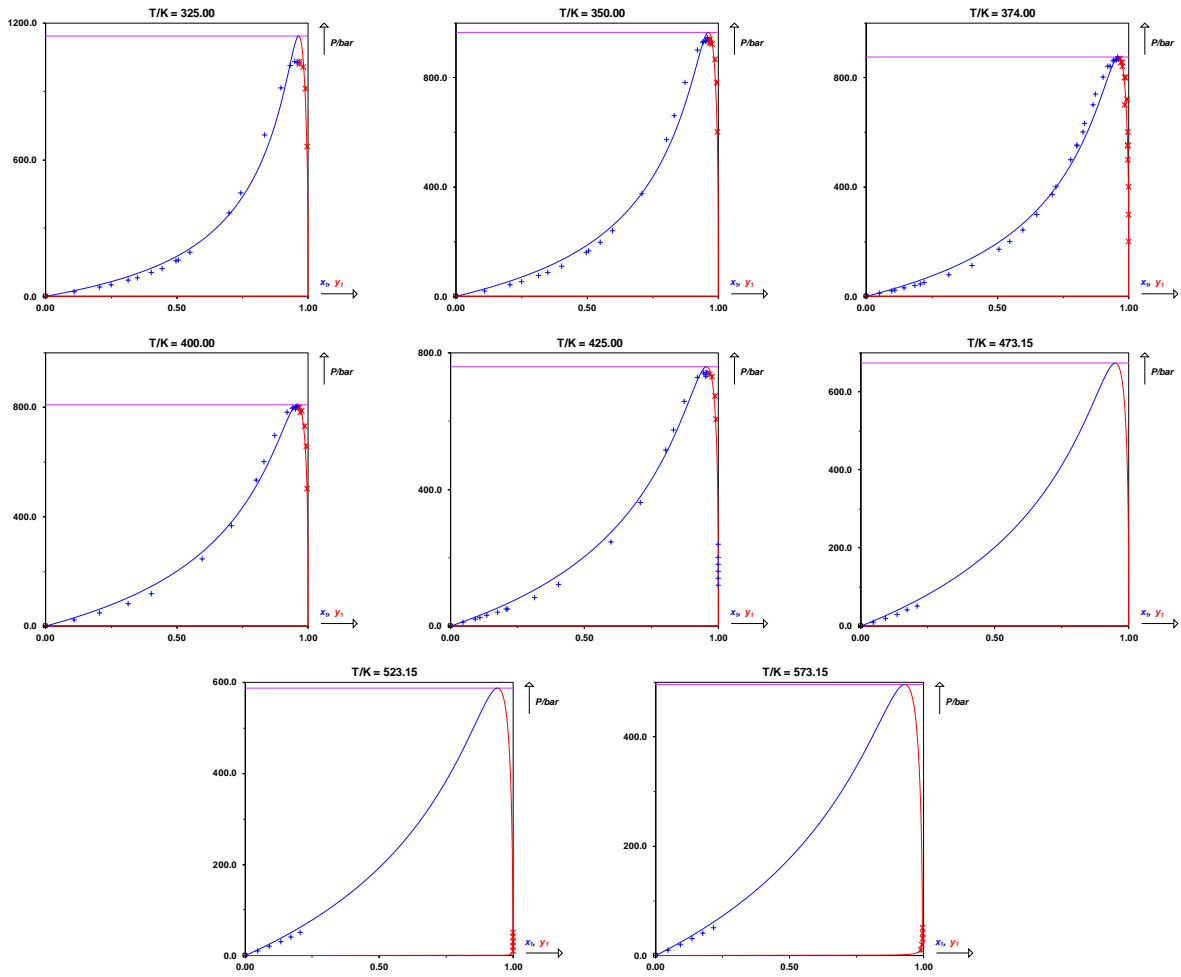
P / bar x_1
741.90 0.9570
730.20 0.9520
737.90 0.9510
740.70 0.9440
728.80 0.9210
657.80 0.8730
574.00 0.8330
514.50 0.8020
362.10 0.7080
246.60 0.5980
121.70 0.4020
84.60 0.3140
49.80 0.2060
23.60 0.1080

Huang, Chen-Pao - Jan, Dong-Syau - Tsai, Fuan-Nan,
Modeling of Methane Solubility in Heavy n-Paraffins.,
JOURNAL OF CHEMICAL ENGINEERING OF JAPAN. 25
(1992) 182-186. doi:10.1252/jcej.25.182

T / K = 473.15

P / bar x_1

NA-NA systems (BAC = 1)



NITROGEN (1) + METHANE (2)

CAS	7727-37-9	74-82-8
InChiKey	MDFFNEOEWAXZRQ-UHFFFAOYSA-N	VNWKTKETHGBQD-UHFFFAOYSA-N
T_c / K	126.20	190.56
P_c / bar	34.00	45.99
ω	0.038	0.012

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 30.40$

$B/\text{MPa} = 36.53$

Deviations

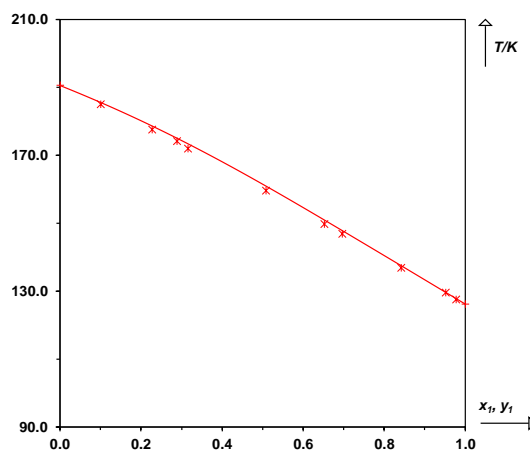
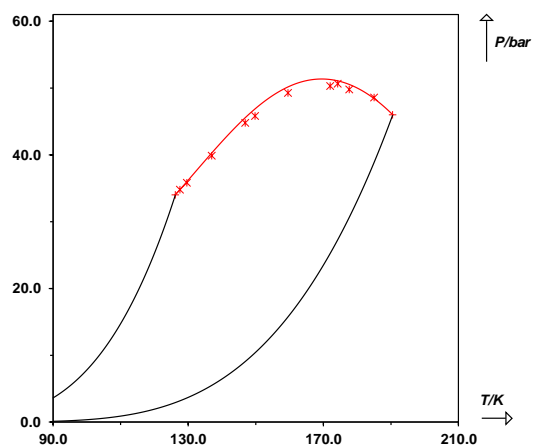
MAPE on $x = 3.0\%$

MAPE on $y = 2.4\%$

MAPE on $x_c = 4.0\%$

MAPE on $P_c = 1.2\%$

MAPE on $h^M = 8.8\%$



Isothermal phase equilibrium data

Sprow, F. B. - Prausnitz, J. M., Vapor-Liquid equilibria for five cryogenic mixtures, AIChE Journal. 12 (1966) 780-784. doi:10.1002/aic.690120427

T / K = 90.67

P / bar	x ₁	y ₁
0.9583	0.1330	0.8890
1.265	0.2000	0.9200
1.417	0.2380	0.9280
1.783	0.3410	0.9470
2.060	0.4290	0.9590
2.359	0.5310	0.9680
2.641	0.6280	0.9750
3.178	0.8110	0.9850
3.648	0.9520	0.9950

Parrish, W. R. - Hiza, M. J., Liquid-Vapor Equilibria in the Nitrogen-Methane System between 95 and 120 K, Advances in Cryogenic Engineering. (1995) 300-308.

T / K = 95.00

P / bar	x ₁	y ₁
2.254	0.2679	0.9216
2.737	0.3562	0.9374
3.018	0.4249	0.9460
3.431	0.5271	0.9573
3.646	0.5889	0.9618
4.247	0.7495	0.9756
4.580	0.8271	0.9823

Parrish, W. R. - Hiza, M. J., Liquid-Vapor Equilibria in the Nitrogen-Methane System between 95 and 120 K, Advances in Cryogenic Engineering. (1995) 300-308.

T / K = 100.00

P / bar	x ₁	y ₁
1.988	0.1329	0.8336
2.960	0.2397	0.8907
3.621	0.3301	0.9168
3.989	0.3831	0.9277
4.396	0.4463	0.9372
4.706	0.5069	0.9448
5.032	0.5638	0.9508
5.598	0.6671	0.9618
6.451	0.8133	0.9764

Han, Xiao Hong - Zhang, Yu Jia - Gao, Zan Jun - Xu, Ying Jie - Wang, Qin - Chen, Guang Ming, Vapor-Liquid Equilibrium for the Mixture Nitrogen (N₂) + Methane (CH₄) in the Temperature Range of (110 to 125) K, Journal of Chemical & Engineering Data. 57 (2012) 1621-1626. doi:10.1021/je201299u

T / K = 100.00

P / bar	x ₁	y ₁
0.3893	0.0041	0.1345
3.001	0.2675	0.9000
3.973	0.4052	0.9312
4.860	0.5333	0.9522
6.098	0.7489	0.9752
6.789	0.8588	0.9881

Han, Xiao Hong - Zhang, Yu Jia - Gao, Zan Jun - Xu, Ying Jie - Wang, Qin - Chen, Guang Ming, Vapor-Liquid Equilibrium for the Mixture Nitrogen (N₂) + Methane (CH₄) in the Temperature Range of (110 to 125) K, Journal of Chemical & Engineering Data. 57 (2012) 1621-1626. doi:10.1021/je201299u

T / K = 114.99

P / bar	x ₁	y ₁
2.051	0.0296	0.3571
2.303	0.0395	0.4424
3.906	0.1102	0.6796
4.727	0.1532	0.7456
5.537	0.1932	0.7882
7.119	0.2838	0.8405
8.532	0.3619	0.8740
9.042	0.3932	0.8836
12.05	0.5900	0.9262

Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen-methane system, Journal of Chemical & Engineering Data. 19 (1974) 334-339. doi:10.1021/je60063a023

T / K = 122.04

P / bar	x ₁	y ₁
2.792	0.0165	0.1963
3.447	0.0351	0.3466
5.171	0.0850	0.5588
6.881	0.1411	0.6655
13.79	0.4283	0.8411
19.63	0.7093	0.9109
20.70	0.7524	0.9225
21.44	0.7837	0.9308
24.41	0.8962	0.9589
26.20	0.9514	0.9785
27.46	0.9880	0.9946

Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen-methane system, Journal of Chemical & Engineering Data. 19 (1974) 334-339. doi:10.1021/je60063a023

T / K = 127.59

P / bar	x ₁	y ₁
3.530	0.0097	0.1144

NA-NA systems (BAC = 1)

5.171	0.0471	0.3786
6.881	0.0912	0.5318
13.79	0.3040	0.7662
20.55	0.5475	0.8564
27.03	0.7825	0.9129
28.75	0.8353	0.9263
30.54	0.8822	0.9410
31.72	0.9122	0.9521
32.41	0.9308	0.9604
33.10	0.9412	0.9644
33.72	0.9540	0.9709
34.41	0.9674	0.9761
34.61	0.9724	0.9781
34.68	0.9741	0.9779
34.78	0.9777	0.9777 CRIT

Cines, M.R. - Roach, J.T. - Hogan, R.J. - Roland, C.H., Nitrogen-methane vapor-liquid equilibria, Chem. Eng. Progr. Symp. Ser. 49 (1953) 1-10.

T / K = 133.15

P / bar	x ₁	y ₁
4.826	0.0080	0.0790
5.516	0.0210	0.1780
6.205	0.0360	0.2600
6.895	0.0500	0.3300
8.619	0.0860	0.4600
10.34	0.1250	0.5500
12.07	0.1640	0.6180
13.79	0.2050	0.6680
17.24	0.3010	0.7390
20.68	0.4060	0.7890
24.13	0.5130	0.8290
27.58	0.6210	0.8600
31.03	0.7250	0.8880
34.47	0.8220	0.9120

Bloomer, O.T. - Parent, J.D., Liquid-vapor phase behavior of the methane-nitrogen system, Chem. Eng. Progr. Symp. Ser. 49 (1953) 11-24.

T / K = 133.15

P / bar	x ₁	y ₁
6.895	0.0513	0.3379
10.34	0.1209	0.5467
13.79	0.2102	0.6647
17.24	0.3055	0.7313
20.68	0.4058	0.7797
24.13	0.5072	0.8176
27.58	0.6152	0.8475
31.03	0.7166	0.8734
34.47	0.8036	0.8945

Kidnay, A.J. - Miller, R.C. - Parrish, W.R. - Hiza, M.J., Liquid-vapour phase equilibria in the N₂-CH₄ system from 130 to 180 K, Cryogenics. 15 (1975) 531-540. doi:10.1016/0011-2275(75)90149-6

T / K = 140.00

P / bar	x ₁	y ₁
7.221	0.0132	0.1051
8.298	0.0316	0.2166
9.258	0.0485	0.2952
10.11	0.0637	0.3498
14.06	0.1372	0.5228
18.05	0.2165	0.6214
21.94	0.3008	0.6850
26.59	0.4063	0.7383
30.76	0.5026	0.7726
32.69	0.5512	0.7849
36.33	0.6304	0.8038
37.86	0.6662	0.8107
40.39	0.7267	0.8128
42.00	0.7788	0.8032

Cines, M.R. - Roach, J.T. - Hogan, R.J. - Roland, C.H., Nitrogen-methane vapor-liquid equilibria, Chem. Eng. Progr. Symp. Ser. 49 (1953) 1-10.

T / K = 144.26

P / bar	x ₁	y ₁
8.619	0.0090	0.0700
10.34	0.0360	0.2100
12.07	0.0630	0.3170
13.79	0.0890	0.3950
17.24	0.1450	0.5120
20.68	0.2060	0.5920
24.13	0.2770	0.6510
27.58	0.3520	0.6920
31.03	0.4310	0.7260
34.47	0.5090	0.7520
37.92	0.5880	0.7700
41.37	0.6680	0.7830

Bloomer, O.T. - Parent, J.D., Liquid-vapor phase behavior of the methane-nitrogen system, Chem. Eng. Progr. Symp. Ser. 49 (1953) 11-24.

T / K = 144.26

P / bar	x ₁	y ₁
10.34	0.0394	0.2185
13.79	0.0908	0.3977
17.24	0.1497	0.5023
20.68	0.2152	0.5804
24.13	0.2820	0.6358
27.58	0.3476	0.6801

NA-NA systems (BAC = 1)

31.03	0.4181	0.7120
34.47	0.4970	0.7363
37.92	0.5737	0.7523

Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen-methane system, Journal of Chemical & Engineering Data. 19 (1974) 334-339. doi:10.1021/je60063a023

T / K = 149.82

P / bar	x ₁	y ₁
12.34	0.0284	0.1529
13.96	0.0514	0.2404
17.20	0.0985	0.3683
20.62	0.1503	0.4579
27.34	0.2579	0.5779
34.13	0.3778	0.6480
40.96	0.5034	0.6867
44.75	0.5866	0.6878
45.78	0.6528	0.6528 CRIT

Cines, M.R. - Roach, J.T. - Hogan, R.J. - Roland, C.H., Nitrogen-methane vapor-liquid equilibria, Chem. Eng. Progr. Symp. Ser. 49 (1953) 1-10.

T / K = 155.37

P / bar	x ₁	y ₁
13.79	0.0060	0.0400
17.24	0.0460	0.2130
20.68	0.0890	0.3340
24.13	0.1360	0.4160
27.58	0.1850	0.4790
31.03	0.2380	0.5260
34.47	0.2950	0.5650
37.92	0.3540	0.5970
41.37	0.4150	0.6200
44.82	0.4790	0.6340

Bloomer, O.T. - Parent, J.D., Liquid-vapor phase behavior of the methane-nitrogen system, Chem. Eng. Progr. Symp. Ser. 49 (1953) 11-24.

T / K = 155.37

P / bar	x ₁	y ₁
13.79	0.0075	0.0448
17.24	0.0497	0.2021
20.68	0.0934	0.3235
24.13	0.1406	0.4076
27.58	0.1881	0.4679
31.03	0.2391	0.5153
34.47	0.2921	0.5515
37.92	0.3479	0.5799
41.37	0.4043	0.5992
44.82	0.4626	0.6084

Kidnay, A.J. - Miller, R.C. - Parrish, W.R. - Hiza, M.J., Liquid-vapour phase equilibria in the N₂-CH₄ system from 130 to 180 K, Cryogenics. 15 (1975) 531-540. doi:10.1016/0011-2275(75)90149-6

T / K = 160.00

P / bar	x ₁	y ₁
16.81	0.0095	0.0438
17.97	0.0223	0.0979
18.99	0.0334	0.1394
19.91	0.0448	0.1742
21.94	0.0684	0.2406
22.10	0.0714	0.2458
26.19	0.1205	0.3442
30.38	0.1756	0.4184
33.95	0.2243	0.4657
38.46	0.2820	0.5051
42.29	0.3333	0.5289
46.15	0.3937	0.5422
47.86	0.4246	0.5360
48.38	0.4310	0.5315

Bloomer, O.T. - Parent, J.D., Liquid-vapor phase behavior of the methane-nitrogen system, Chem. Eng. Progr. Symp. Ser. 49 (1953) 11-24.

T / K = 166.48

P / bar	x ₁	y ₁
20.68	0.0017	0.0068
24.13	0.0369	0.1287
27.58	0.0728	0.2211
31.03	0.1104	0.2876
34.47	0.1489	0.3385
37.92	0.1901	0.3789
41.37	0.2370	0.4098
44.82	0.2873	0.4316
48.26	0.3435	0.4379

Kidnay, A.J. - Miller, R.C. - Parrish, W.R. - Hiza, M.J., Liquid-vapour phase equilibria in the N₂-CH₄ system from 130 to 180 K, Cryogenics. 15 (1975) 531-540. doi:10.1016/0011-2275(75)90149-6

T / K = 170.00

P / bar	x ₁	y ₁
24.27	0.0082	0.0291
25.39	0.0189	0.0652
26.20	0.0276	0.0889
27.47	0.0399	0.1219
28.43	0.0495	0.1458
30.36	0.0688	0.1875
34.43	0.1115	0.2593
38.58	0.1562	0.3135

NA-NA systems (BAC = 1)

42.52	0.2001	0.3519	40.24	0.0632	0.1260
46.31	0.2466	0.3743	42.72	0.0863	0.1572
48.33	0.2729	0.3784	44.75	0.1083	0.1786
48.95	0.2915	0.3798	46.56	0.1254	0.1919
49.39	0.3066	0.3801	48.70	0.1567	0.1992

Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen-methane system, Journal of Chemical & Engineering Data. 19 (1974) 334-339. doi:10.1021/je60063a023

T / K = 172.04

P / bar	x ₁	y ₁
25.55	0.0060	0.0194
26.89	0.0169	0.0525
27.65	0.0245	0.0740
31.23	0.0576	0.1532
34.48	0.0925	0.2157
37.92	0.1287	0.2646
41.23	0.1657	0.3009
48.47	0.2599	0.3445
50.33	0.3156	0.3156 CRIT

Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen-methane system, Journal of Chemical & Engineering Data. 19 (1974) 334-339. doi:10.1021/je60063a023

T / K = 177.59

P / bar	x ₁	y ₁
31.03	0.0041	0.0120
34.51	0.0326	0.0794
36.82	0.0555	0.1266
39.58	0.0828	0.1693
41.99	0.1097	0.2023
44.82	0.1391	0.2286
46.61	0.1631	0.2459
48.26	0.1816	0.2495
48.88	0.1929	0.2488
49.64	0.2026	0.2458
49.78	0.2272	0.2272 CRIT

Kidnay, A.J. - Miller, R.C. - Parrish, W.R. - Hiza, M.J., Liquid-vapour phase equilibria in the N₂-CH₄ system from 130 to 180 K, Cryogenics. 15 (1975) 531-540. doi:10.1016/0011-2275(75)90149-6

T / K = 180.00

P / bar	x ₁	y ₁
34.11	0.0089	0.0230
35.40	0.0202	0.0494
36.72	0.0327	0.0738
37.87	0.0434	0.0936
39.45	0.0588	0.1192

Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen-methane system, Journal of Chemical & Engineering Data. 19 (1974) 334-339. doi:10.1021/je60063a023

T / K = 183.15

P / bar	x ₁	y ₁
39.71	0.0254	0.0493
41.23	0.0416	0.0774
42.96	0.0568	0.0964
45.09	0.0785	0.1251
46.47	0.0911	0.1357
47.51	0.1060	0.1425
48.26	0.1165	0.1449
48.47	0.1175	0.1425

Isobaric phase equilibrium data

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 34.47

T / K	x ₁
174.87	0.0611
170.98	0.1002
155.59	0.2888
143.76	0.5088
136.76	0.6970
131.93	0.8422
128.48	0.9515

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 34.47

T / K	y ₁
178.82	0.0611
177.21	0.1002
168.87	0.2888
157.71	0.5088

146.82 0.6970
 136.87 0.8422
 129.43 0.9515

Brandt, L. W. - Stroud, Lowell., Phase Equilibria in Natural Gas Systems. Apparatus with Windowed Cell for 800 P.S.I.G. and Temperatures to -320° F., Industrial & Engineering Chemistry. 50 (1958) 849-852. doi:10.1021/ie50581a046

P / bar = 34.47

T / K	x_1	y_1
174.82	0.0540	0.1320
173.71	0.0660	0.1640
172.59	0.0850	0.2010
163.15	0.1860	0.4070
160.93	0.2020	0.4300
158.15	0.2430	0.4900
154.82	0.3070	0.5780
150.37	0.3660	0.6360
137.04	0.7080	0.8390

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 37.92

T / K	x_1
178.09	0.0611
174.21	0.1002
159.26	0.2888
146.93	0.5088
139.71	0.6970
134.65	0.8422

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 37.92

T / K	y_1
181.48	0.0611
179.71	0.1002
170.98	0.2888
159.48	0.5088
148.04	0.6970
137.82	0.8422

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 41.37

T / K	x_1
181.15	0.0611
177.37	0.1002
162.82	0.2888
150.09	0.5088
142.71	0.6970

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 41.37

T / K	y_1
183.87	0.0611
182.04	0.1002
172.82	0.2888
160.93	0.5088
148.98	0.6970

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 44.82

T / K	x_1
184.15	0.0611
180.48	0.1002
166.37	0.2888
153.37	0.5088
146.93	0.6970

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 44.82

T / K	y_1
186.09	0.0611
184.21	0.1002
174.37	0.2888

161.93 0.5088
149.04 0.6970

Enthalpy of mixing

McClure, D.W - Lewis, K.L - Miller, R.C - Staveley, L.A.K,
Excess enthalpies and Gibbs free energies for nitrogen +
methane at temperatures below the critical point of
nitrogen, The Journal of Chemical Thermodynamics. 8
(1976) 785-792. doi:10.1016/0021-9614(76)90057-4

T / K = 91.50

P / bar = UNKNOWN (8.2035)

$h^M / \text{J.mol}^{-1}$ x_1
60.80 0.1170
109.90 0.2470
136.90 0.4110
139.80 0.4790
136.70 0.5140
106.80 0.7140

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies
of mixing of methane + argon, methane + nitrogen, and
methane + hydrogen in the gaseous and two-phase
regions, The Journal of Chemical Thermodynamics. 9
(1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 183.00

P / bar = 21.40

$h^M / \text{J.mol}^{-1}$ z_1
53.00 0.2200
67.00 0.3320
70.00 0.4430
69.00 0.5670
53.00 0.7210

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies
of mixing of methane + argon, methane + nitrogen, and
methane + hydrogen in the gaseous and two-phase
regions, The Journal of Chemical Thermodynamics. 9
(1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 183.00

P / bar = 40.80

$h^M / \text{J.mol}^{-1}$ z_1
2006.0 0.1060
3059.0 0.1770
2823.0 0.2980
2747.0 0.3240
2688.0 0.3610
2425.0 0.4180
2337.0 0.4550
1422.0 0.6660

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies
of mixing of methane + argon, methane + nitrogen, and
methane + hydrogen in the gaseous and two-phase
regions, The Journal of Chemical Thermodynamics. 9
(1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 183.00

P / bar = 71.60

$h^M / \text{J.mol}^{-1}$ z_1
131.00 0.1510
330.00 0.2360
850.00 0.3460
1068.0 0.4450
1053.0 0.5330
725.00 0.7200
379.00 0.8530

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental
heats of mixing for gaseous nitrogen and methane, AIChE
Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 195.15

P / bar = 20.27

$h^M / \text{J.mol}^{-1}$ z_1
45.00 0.6000
48.00 0.5000
47.00 0.4000
43.00 0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental
heats of mixing for gaseous nitrogen and methane, AIChE
Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 195.15

P / bar = 81.06

$h^M / \text{J.mol}^{-1}$ z_1
910.00 0.6000
1040.0 0.5000
1090.0 0.4000
972.00 0.3000

Wormald, Christopher J. - Lewis, Keith L. - Mosedale,
Stephen, The excess enthalpies of hydrogen + methane,
hydrogen + nitrogen, methane + nitrogen, methane +
argon, and nitrogen + argon at 298 and 201 K at pressures
up to 10.2 MPa, The Journal of Chemical
Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-
9614(77)90194-X

T / K = 201.00

P / bar = 30.50

$h^M / \text{J.mol}^{-1}$ z_1
65.00 0.2590
77.00 0.3520
81.00 0.4500
82.00 0.5310

NA-NA systems (BAC = 1)

71.00 0.6510
56.00 0.7390

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K = 201.00
P / bar = 51.50
 $h^M / J.mol^{-1}$ z_1
337.00 0.2410
396.00 0.3490
394.00 0.4820

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K = 201.00
P / bar = 65.80
 $h^M / J.mol^{-1}$ z_1
874.00 0.0700
1107.0 0.1600
1195.0 0.2490
1140.0 0.3480
1071.0 0.4410
906.00 0.5530
486.00 0.7640

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 233.15
P / bar = 40.53
 $h^M / J.mol^{-1}$ z_1
70.60 0.6000
76.00 0.5000
74.10 0.4000
65.70 0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 233.15
P / bar = 81.06
 $h^M / J.mol^{-1}$ z_1

261.50 0.6000
293.50 0.5000
301.90 0.4000
282.70 0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 253.15
P / bar = 20.27
 $h^M / J.mol^{-1}$ z_1
19.70 0.6000
21.10 0.5000
20.70 0.4000
18.50 0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 253.15
P / bar = 60.80
 $h^M / J.mol^{-1}$ z_1
98.20 0.6000
107.10 0.5000
106.90 0.4000
96.60 0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 253.15
P / bar = 101.33
 $h^M / J.mol^{-1}$ z_1
228.80 0.6000
251.60 0.5000
252.80 0.4000
229.60 0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 273.15
P / bar = 40.53
 $h^M / J.mol^{-1}$ z_1
40.40 0.6000
43.20 0.5000
42.40 0.4000
37.70 0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 273.15
P / bar = 81.06
 $h^M / J.mol^{-1}$ z_1

108.30	0.6000
117.30	0.5000
116.00	0.4000
103.90	0.3000

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K = 298.00
P / bar = 61.80
 $h^M / J.mol^{-1}$ z_1

54.00	0.2810
64.00	0.3770
63.00	0.4350
58.00	0.5700
46.00	0.7110

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K = 298.00
P / bar = 102.30
 $h^M / J.mol^{-1}$ z_1

109.00	0.2790
122.00	0.4010
120.00	0.5260
107.00	0.6420
81.00	0.7570

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 313.15
P / bar = 40.53
 $h^M / J.mol^{-1}$ z_1

27.90	0.6000
29.60	0.5000
28.70	0.4000
24.90	0.3000

Klein, R. R. - Bennett, C. O. - Dodge, B. F., Experimental heats of mixing for gaseous nitrogen and methane, AIChE Journal. 17 (1971) 958-965. doi:10.1002/aic.690170432

T / K = 313.15
P / bar = 81.06
 $h^M / J.mol^{-1}$ z_1

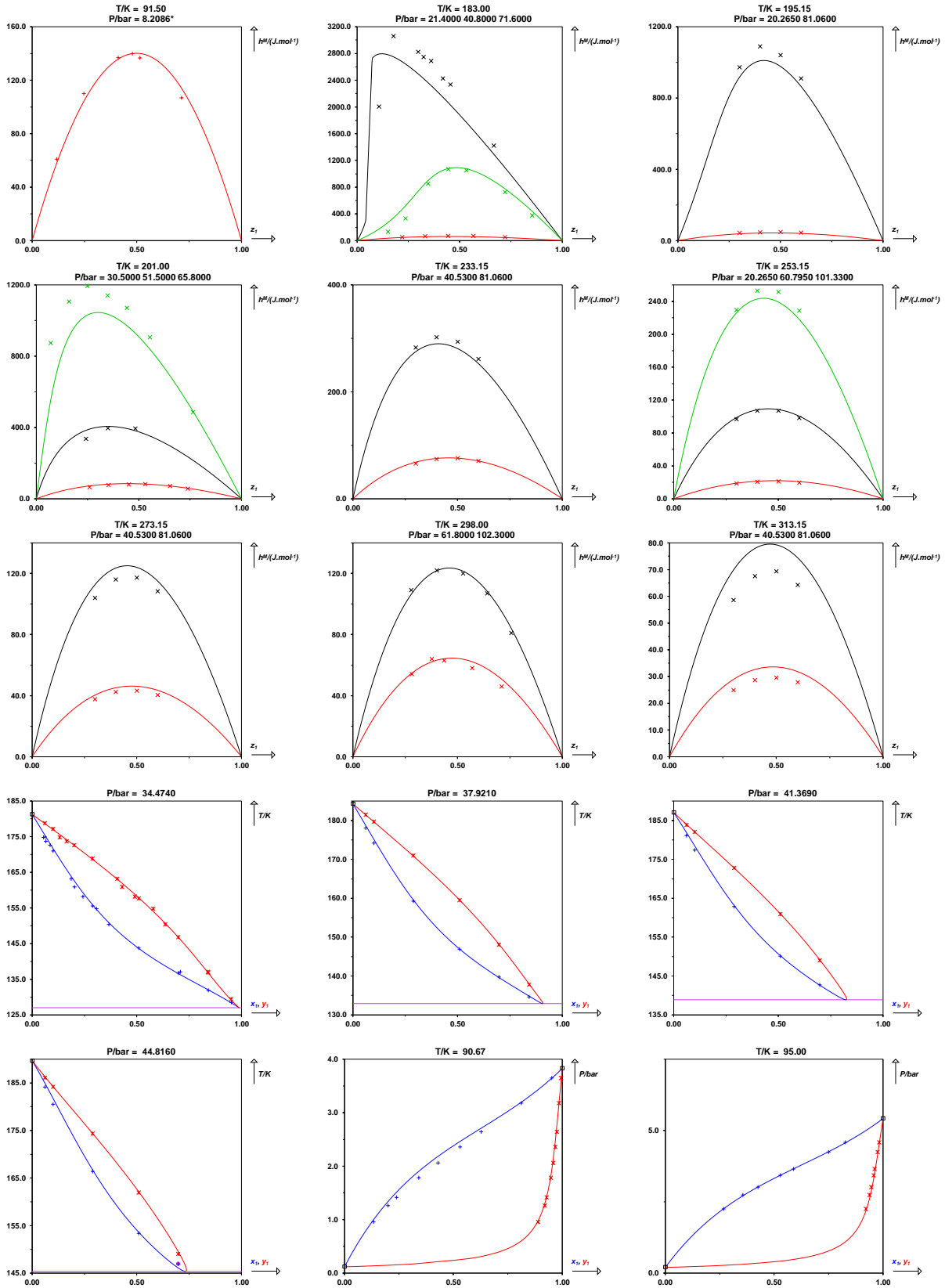
64.30	0.6000
69.40	0.5000
67.50	0.4000
58.60	0.3000

Critical point

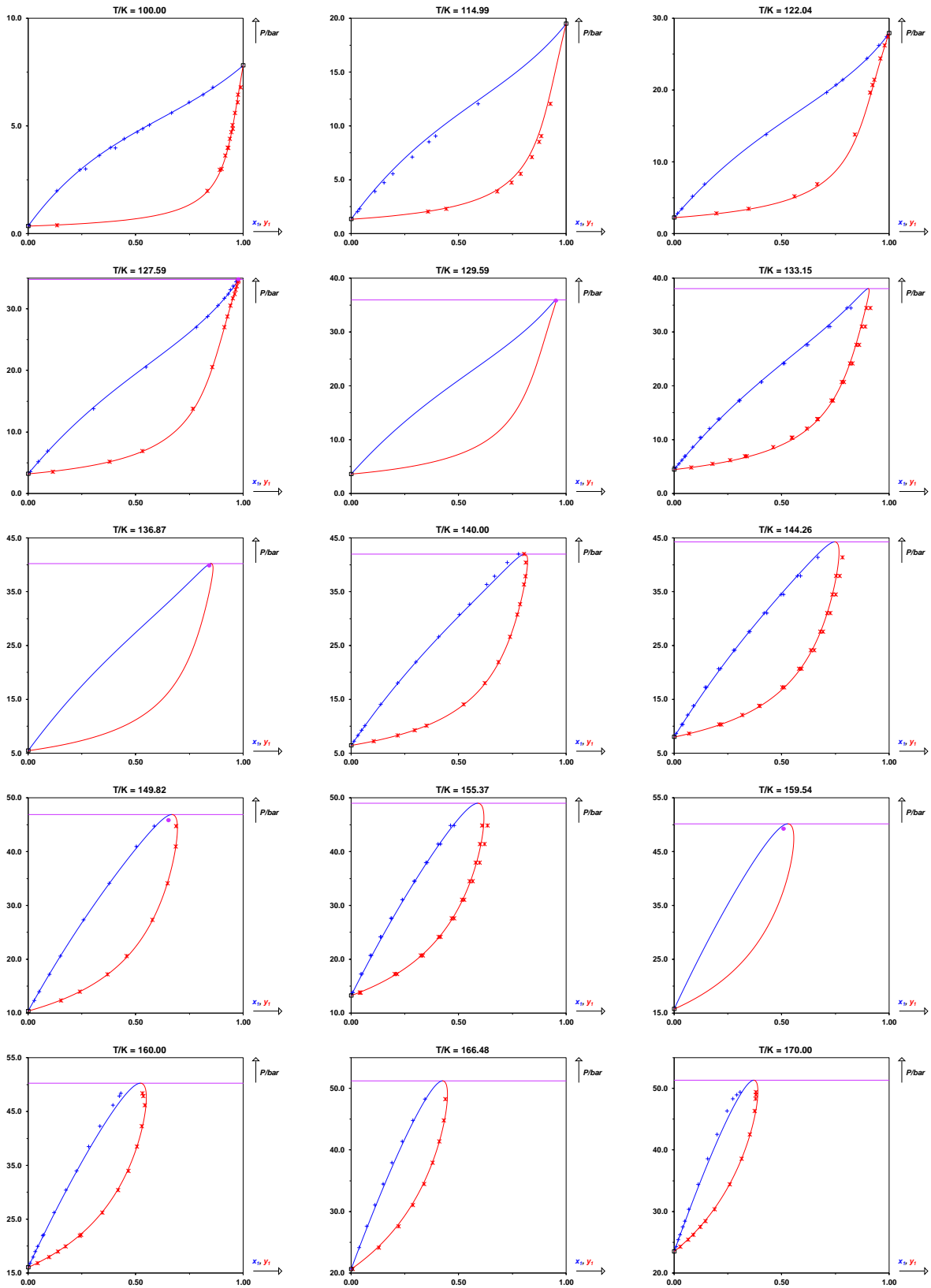
Bloomer, O.T. - Parent, J.D., Liquid-vapor phase behavior of the methane-nitrogen system, Chem. Eng. Progr. Symp. Ser. 49 (1953) 11-24.

T / K	P / bar	x_1
129.59	35.78	0.9515
136.87	39.85	0.8423
146.93	44.82	0.6970
159.54	49.23	0.5088
174.21	50.68	0.2879
185.09	48.61	0.1002

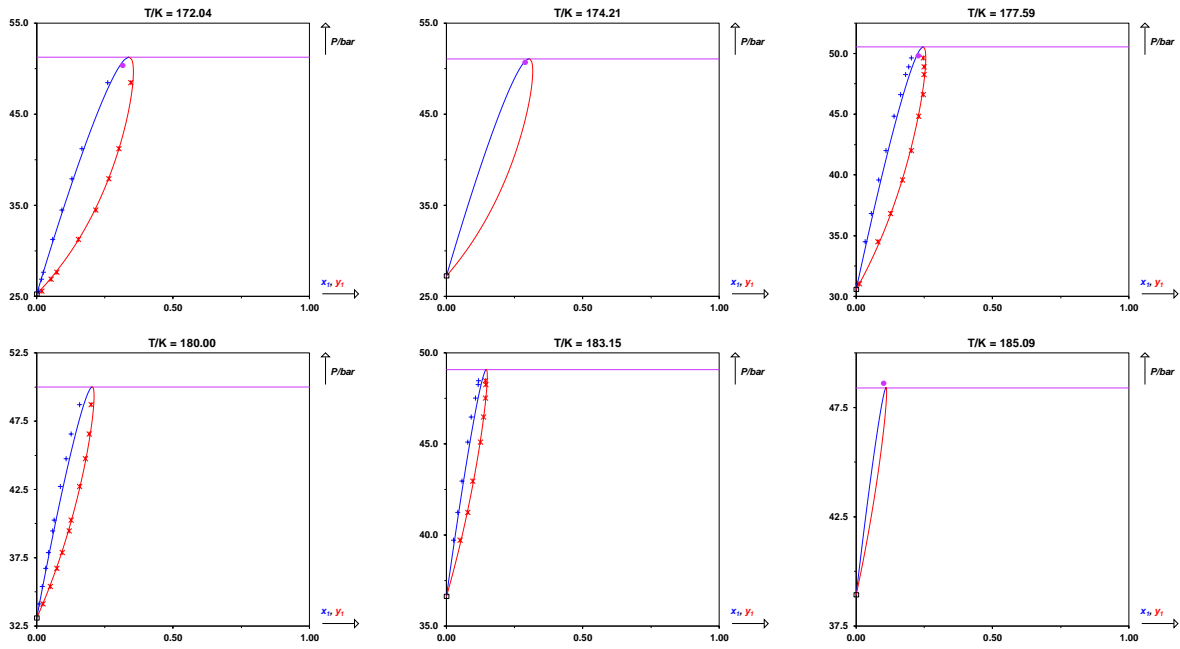
NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NITROGEN (1) + ETHANE (2)

CAS	7727-37-9	74-84-0
InChiKey	MDFFN0E0WAXZRQ-UHFFFAOYSA-N	OTMSDBZUPAUEDD-UHFFFAOYSA-N
T_c / K	126.20	305.32
P_c / bar	34.00	48.72
ω	0.038	0.099

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 99.86$

$B/\text{MPa} = -38.64$

Deviations

MAPE on $x = 15\%$

MAPE on $y = 4.1\%$

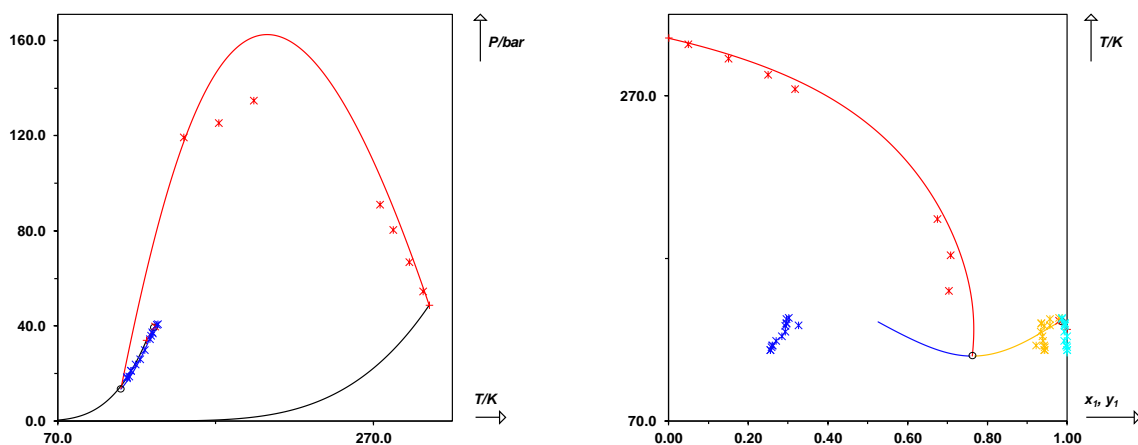
MAPE on $x_c = 14\%$

MAPE on $P_c = 13\%$

MAPE on $x_{LLV} = 47\%$

MAPE on $P_{LLV} = 1.1\%$

MAPE on $h^M = 80\%$



-----				90.39	0.3755	0.9277	
Isothermal phase equilibrium data				103.42	0.4327	0.9012	
-----				120.66	0.5626	0.8138	
Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen- ethane system, Journal of Chemical & Engineering Data. 19 (1974) 340-343. doi:10.1021/je60063a024				124.93	0.6341	0.7704	
T / K = 138.71				125.35	0.7080	0.7080	CRIT
P / bar	x ₁	y ₁		Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen- ethane system, Journal of Chemical & Engineering Data. 19 (1974) 340-343. doi:10.1021/je60063a024			
3.530	0.0188	0.9865		T / K = 194.26			
6.895	0.0387	0.9916		P / bar	x ₁	y ₁	
10.34	0.0579	0.9934		3.516	0.0057	0.4862	
13.79	0.0776	0.9941		6.915	0.0161	0.7146	
20.69	0.1192	0.9944		13.79	0.0372	0.8360	
27.58	0.1637	0.9942		27.58	0.0808	0.8966	
34.48	0.2120	0.9931		41.51	0.1273	0.9126	
68.95	0.3897	0.9552		55.71	0.1756	0.9154	
69.09	0.3740	0.9622		69.09	0.2225	0.9126	
Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen- ethane system, Journal of Chemical & Engineering Data. 19 (1974) 340-343. doi:10.1021/je60063a024				89.77	0.3024	0.8977	
T / K = 149.82				97.56	0.3338	0.8885	
P / bar	x ₁	y ₁		120.24	0.4534	0.8355	
3.447	0.0156	0.9604		121.35	0.4577	0.8304	
6.929	0.0318	0.9787		130.86	0.5510	0.7714	
10.34	0.0480	0.9841		134.18	0.6472	0.7144	
13.81	0.0640	0.9875		134.65	0.6746	0.6746	CRIT
20.69	0.0970	0.9894		Grausø, Louis - Fredenslund, Aage - Mollerup, Jørgen, Vapour-liquid equilibrium data for the systems C ₂ H ₆ + N ₂ , C ₂ H ₄ + N ₂ , C ₃ H ₈ + N ₂ , and C ₃ H ₆ + N ₂ , Fluid Phase Equilibria. 1 (1977) 13-26. doi:10.1016/0378- 3812(77)80022-8			
27.58	0.1343	0.9899		T / K = 200.00			
34.48	0.1685	0.9883		P / bar	x ₁	y ₁	
41.44	0.2058	0.9866		6.657	0.0137	0.6389	
55.50	0.2839	0.9810		10.43	0.0264	0.7533	
69.09	0.3531	0.9592		21.17	0.0647	0.8568	
119.14	0.7038	0.7038	CRIT	41.54	0.1360	0.9029	
Stryjek, Roman - Chappellear, Patsy S. - Kobayashi, Riki, Low-temperature vapor-liquid equilibriums of nitrogen- ethane system, Journal of Chemical & Engineering Data. 19 (1974) 340-343. doi:10.1021/je60063a024				60.99	0.2063	0.9064	
T / K = 172.04				80.48	0.2764	0.8981	
P / bar	x ₁	y ₁		102.42	0.3751	0.8716	
3.620	0.0123	0.8449		124.79	0.5112	0.8116	
6.936	0.0232	0.9132		131.95	0.5728	0.7620	
13.72	0.0486	0.9475		Brown, T.S. - Sloan, E.D. - Kidnay, A.J., Vapor-liquid equilibria in the nitrogen + carbon dioxide + ethane system, Fluid Phase Equilibria. 51 (1989) 299-313. doi:10.1016/0378-3812(89)80372-3			
13.79	0.0485	0.9478		T / K = 220.00			
27.58	0.0990	0.9637		P / bar	x ₁	y ₁	
41.78	0.1552	0.9664		10.07	0.0160	0.4638	
55.30	0.2090	0.9621					
68.81	0.2689	0.9560					

NA-NA systems (BAC = 1)

17.45	0.0356	0.6584
24.16	0.0552	0.7332
37.62	0.0952	0.7961
44.87	0.1168	0.8116
51.79	0.1394	0.8221
58.29	0.1582	0.8264
65.62	0.1838	0.8298
72.96	0.2077	0.8286
79.45	0.2326	0.8276
86.64	0.2572	0.8225
92.61	0.2810	0.8173
105.10	0.3310	0.7982
119.80	0.4080	0.7592

Grausø, Louis - Fredenslund, Aage - Mollerup, Jørgen, Vapour-liquid equilibrium data for the systems C2H6 + N2, C2H4 + N2, C3H8 + N2, and C3H6 + N2, Fluid Phase Equilibria. 1 (1977) 13-26. doi:10.1016/0378-3812(77)80022-8

T / K = 230.00

P / bar	x ₁	y ₁
10.54	0.0094	0.2927
15.70	0.0240	0.4889
21.56	0.0399	0.6029
34.52	0.0776	0.7129
54.05	0.1372	0.7660
80.72	0.2265	0.7796
101.77	0.3120	0.7566
119.58	0.4110	0.7047
124.76	0.4543	0.6650

Zeck, S. - Knapp, H., Vapor—liquid and vapor—liquid—liquid phase equilibria for binary and ternary systems for nitrogen, ethane and methanol: Experiment and data reduction, Fluid Phase Equilibria. 25 (1986) 303-322. doi:10.1016/0378-3812(86)80006-1

T / K = 240.00

P / bar	x ₁	y ₁
18.69	0.0252	0.4103
25.00	0.0433	0.5262
34.12	0.0698	0.6145
43.10	0.0968	0.6627
50.00	0.1187	0.6854
58.20	0.1442	0.7033
67.00	0.1731	0.7129
75.00	0.2006	0.7167

Zeck, S. - Knapp, H., Vapor—liquid and vapor—liquid—liquid phase equilibria for binary and ternary systems for nitrogen, ethane and methanol: Experiment and data reduction, Fluid Phase Equilibria. 25 (1986) 303-322. doi:10.1016/0378-3812(86)80006-1

T / K =	260.00	
P / bar	x ₁	y ₁
25.00	0.0221	0.2404
33.54	0.0468	0.3761
40.97	0.0692	0.4481
50.00	0.0971	0.5017
57.00	0.1202	0.5291
66.00	0.1504	0.5507
75.00	0.1830	0.5608

Grausø, Louis - Fredenslund, Aage - Mollerup, Jørgen, Vapour-liquid equilibrium data for the systems C2H6 + N2, C2H4 + N2, C3H8 + N2, and C3H6 + N2, Fluid Phase Equilibria. 1 (1977) 13-26. doi:10.1016/0378-3812(77)80022-8

T / K = 260.00

P / bar	x ₁	y ₁
25.72	0.0235	0.2562
31.15	0.0393	0.3478
44.83	0.0796	0.4753
56.46	0.1160	0.5287
71.06	0.1647	0.5576
88.49	0.2373	0.5558
100.55	0.3077	0.5209

Gupta, Mukesh K. - Gardner, Glenn C. - Hegarty, Michael J. - Kidnay, Arthur J., Liquid-vapor equilibria for the N2 + CH4 + C2H6 system from 260 to 280 K, Journal of Chemical & Engineering Data. 25 (1980) 313-318. doi:10.1021/je60087a016

T / K = 260.00

P / bar	x ₁	y ₁
18.34	0.0036	0.0523
20.86	0.0106	0.1375
35.83	0.0541	0.4065
45.48	0.0828	0.4823
65.91	0.1494	0.5541
76.20	0.1873	0.5653
85.39	0.2258	0.5632
95.04	0.2714	0.5473

Brown, T.S. - Sloan, E.D. - Kidnay, A.J., Vapor-liquid equilibria in the nitrogen + carbon dioxide + ethane system, Fluid Phase Equilibria. 51 (1989) 299-313. doi:10.1016/0378-3812(89)80372-3

T / K = 270.00

P / bar	x ₁	y ₁
32.22	0.0282	0.2216
40.80	0.0508	0.3184
54.47	0.0985	0.4159
86.40	0.2282	0.4499
89.94	0.2510	0.4378

NA-NA systems (BAC = 1)

93.04	0.2758	0.4186	56.63	0.0921	0.3167
94.15	0.2900	0.4044	61.00	0.1078	0.3331
94.65	0.2944	0.3939	65.86	0.1277	0.3463
94.90	0.2995	0.3902	66.17	0.1284	0.3471

Gupta, Mukesh K. - Gardner, Glenn C. - Hegarty, Michael J. - Kidnay, Arthur J., Liquid-vapor equilibriums for the N₂ + CH₄ + C₂H₆ system from 260 to 280 K, Journal of Chemical & Engineering Data. 25 (1980) 313-318. doi:10.1021/je60087a016

T / K = 270.00

P / bar	x ₁	y ₁
23.81	0.0051	0.0521
24.67	0.0077	0.0770
25.46	0.0098	0.0942
28.02	0.0157	0.1489
29.01	0.0193	0.1698
30.40	0.0233	0.1889
34.98	0.0359	0.2636
35.16	0.0382	0.2646
35.73	0.0390	0.2668
37.80	0.0435	0.2938
40.93	0.0543	0.3216
41.74	0.0554	0.3339
41.07	0.0563	0.3321
48.05	0.0687	0.3811
46.10	0.0696	0.3618
50.98	0.0848	0.3921
54.18	0.0951	0.4156
55.93	0.0989	0.4127
58.47	0.1076	0.4290
60.98	0.1165	0.4291
71.36	0.1555	0.4545
81.57	0.2030	0.4631
82.50	0.2079	0.4611

Gupta, Mukesh K. - Gardner, Glenn C. - Hegarty, Michael J. - Kidnay, Arthur J., Liquid-vapor equilibriums for the N₂ + CH₄ + C₂H₆ system from 260 to 280 K, Journal of Chemical & Engineering Data. 25 (1980) 313-318. doi:10.1021/je60087a016

T / K = 280.00

P / bar	x ₁	y ₁
29.89	0.0061	0.0437
31.13	0.0097	0.0684
32.22	0.0128	0.0866
36.71	0.0265	0.1558
40.85	0.0394	0.2047
45.95	0.0556	0.2511
50.66	0.0709	0.2835
52.38	0.0767	0.2943

72.63	0.1570	0.3542
75.99	0.1743	0.3521
77.92	0.1852	0.3484
81.31	0.2088	0.3360
81.97	0.2162	0.3339
83.34	0.2311	0.3177

Grausø, Louis - Fredenslund, Aage - Møllerup, Jørgen, Vapour-liquid equilibrium data for the systems C₂H₆ + N₂, C₂H₄ + N₂, C₃H₈ + N₂, and C₃H₆ + N₂, Fluid Phase Equilibria. 1 (1977) 13-26. doi:10.1016/0378-3812(77)80022-8

T / K = 290.00

P / bar	x ₁	y ₁
42.68	0.0242	0.0970
49.54	0.0464	0.1586
55.49	0.0709	0.1940
61.30	0.0936	0.2163
68.32	0.1322	0.2196
70.18	0.1594	0.2115

Isobaric phase equilibrium data

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 13.79

T / K	y ₁
249.93	0.0498
244.93	0.1501
236.87	0.3169
224.21	0.5018
211.54	0.7000
194.48	0.8506
172.71	0.9505
153.21	0.9802

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 13.79

NA-NA systems (BAC = 1)

T / K	x_1	160.26	0.9802
116.54	0.1501		
112.37	0.2002		
109.09	0.9802		
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.		Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.	
P / bar = 24.13		P / bar = 27.58	
T / K	y_1	T / K	x_1
270.59	0.0498	240.65	0.0498
264.37	0.1501	143.82	0.1501
254.26	0.3169	132.32	0.2002
239.48	0.5018	126.15	0.2493
223.87	0.7000	122.43	0.9802
204.04	0.8506	Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.	
178.98	0.9505	P / bar = 31.03	
159.15	0.9802	T / K	y_1
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.		280.71	0.0498
P / bar = 24.13		273.71	0.1501
T / K	x_1	262.09	0.3169
228.71	0.0498	247.21	0.5018
136.98	0.1501	229.26	0.7000
127.71	0.2002	208.09	0.8506
122.37	0.2493	182.65	0.9490
119.71	0.9802	181.32	0.9505
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.		160.93	0.9802
P / bar = 27.58		Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.	
T / K	y_1	P / bar = 31.03	
275.82	0.0498	T / K	x_1
269.32	0.1501	251.04	0.0498
258.43	0.3169	151.15	0.1501
243.87	0.5018	137.04	0.2002
226.76	0.7000	129.87	0.2493
206.21	0.8506	Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.	
181.09	0.9490	P / bar = 31.03	
180.32	0.9505	T / K	x_1

NA-NA systems (BAC = 1)

P / bar =	34.47	267.71	0.0498
T / K	y_1	166.82	0.1501
285.15	0.0498	147.15	0.2002
277.59	0.1501	137.09	0.2493
265.43	0.3169	130.09	0.9802
250.26	0.5018		
231.48	0.7000		
209.65	0.8506		
183.71	0.9490		
182.04	0.9505		
161.37	0.9802		
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.			
P / bar =	41.37		
T / K	y_1		
292.76	0.0498		
284.21	0.1501		
271.26	0.3169		
255.32	0.5018		
235.09	0.7000		
212.15	0.8506		
184.54	0.9490		
182.82	0.9505		
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.			
P / bar =	41.37		
T / K	x_1		
274.54	0.0498		
175.71	0.1501		
152.59	0.2002		
141.37	0.2493		
133.21	0.3169		
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.			
P / bar =	44.82		
T / K	y_1		
295.93	0.0498		
286.98	0.1501		
273.65	0.3169		
257.26	0.5018		
236.54	0.7000		
213.09	0.8506		
184.71	0.9490		
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.			
P / bar =	37.92		
T / K	x_1		
289.15	0.0498		
281.09	0.1501		
268.54	0.3169		
253.21	0.5018		
233.37	0.7000		
210.98	0.8506		
184.43	0.9490		
182.54	0.9505		
161.59	0.9802		
Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH ₄ , C ₂ H ₆ , and N ₂ , Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.			
P / bar =	37.92		
T / K	x_1		

182.98 0.9505

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 44.82

 T / K x_1

280.82 0.0498

186.32 0.1501

158.76 0.2002

145.54 0.2493

136.32 0.3169

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 48.26

 T / K y_1

298.82 0.0498

289.48 0.1501

275.76 0.3169

259.04 0.5018

237.82 0.7000

213.93 0.8506

184.76 0.9490

182.98 0.9505

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

P / bar = 48.26

 T / K x_1

286.87 0.0498

198.26 0.1501

165.76 0.2002

149.59 0.2493

139.37 0.3169

Enthalpy of mixing

Guedes, Henrique J.R - Zollweg, John A - Filipe, Eduardo J.M - Martins, Luís F.G - Calado, Jorge C.G, Thermodynamics of liquid (nitrogen + ethane), The

Journal of Chemical Thermodynamics. 34 (2002) 669-678.
doi:10.1006/jcht.2001.0936

T / K = 92.10
P / bar = 7.900
 $h^M / J.mol^{-1}$ z_1

79.50 0.0500

86.60 0.0550

108.60 0.0760

118.50 0.0840

145.70 0.0850

174.40 0.1120

178.00 0.1300

171.90 0.1920

168.30 0.2500

167.60 0.3010

148.30 0.3980

132.70 0.4780

129.50 0.4990

132.50 0.5120

122.50 0.5730

126.70 0.5830

111.70 0.6100

109.30 0.6860

99.40 0.7350

93.50 0.8010

82.00 0.8370

76.30 0.9080

65.50 0.9500

66.20 0.9600

52.70 0.9700

45.00 0.9760

38.70 0.9860

22.60 0.9980

Critical point

Ellington, R.T. - Eakin, B.E. - Parent, J.D. - Gami, D.C. - Bloomer, O.T., Vapor-liquid phase equilibriums in the binary systems of CH₄, C₂H₆, and N₂, Thermodynamic and Transport Properties of Gases, Liquids, and Solids, Papers Presented at the Symposium on Thermal Properties. 1 (1959) 180-194.

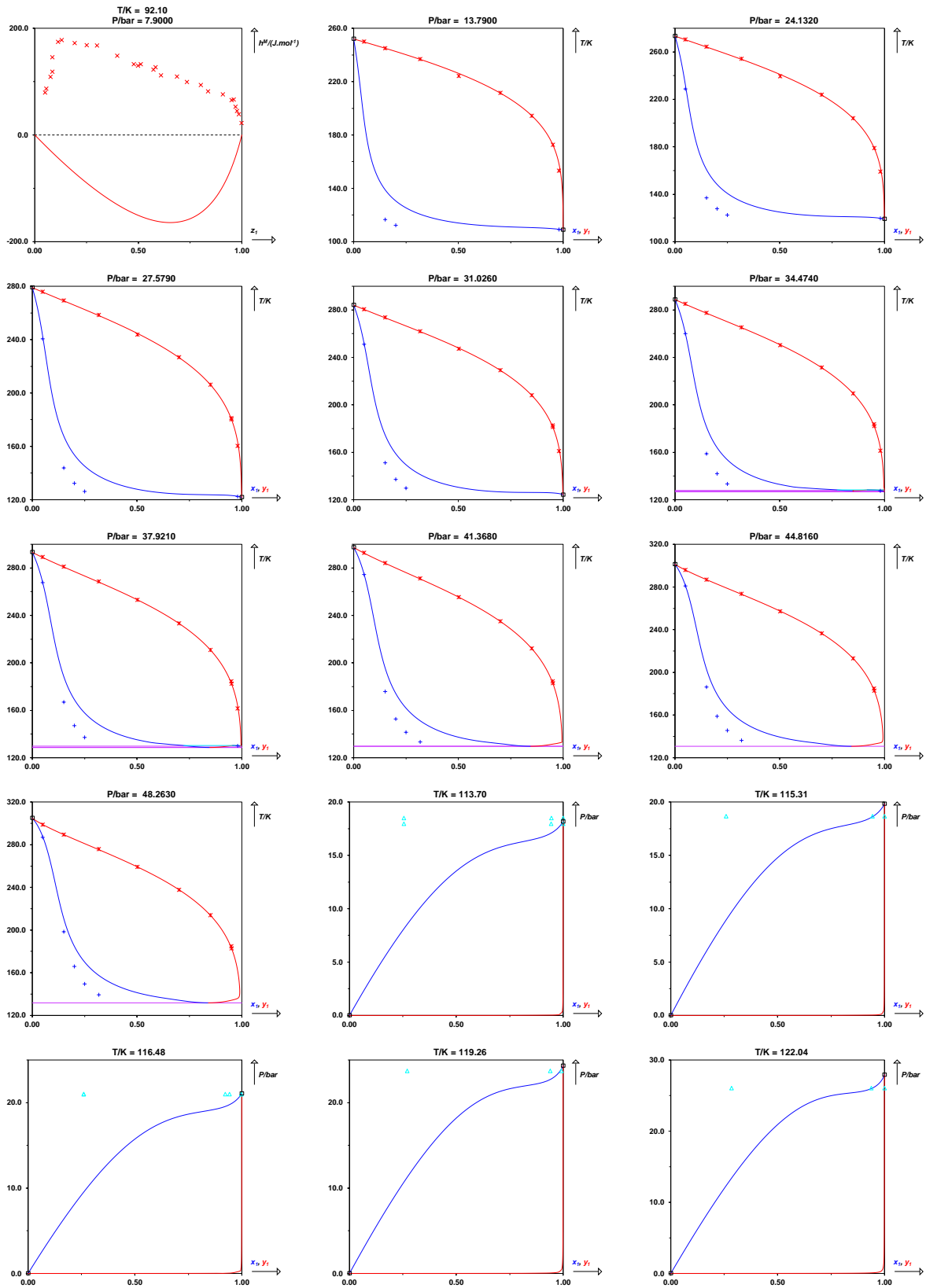
T / K	P / bar	x_1
131.48	39.65	0.9802
273.97	91.07	0.3169
282.65	80.43	0.2493
292.59	66.88	0.1501
301.46	54.36	0.0498

Three-phase line

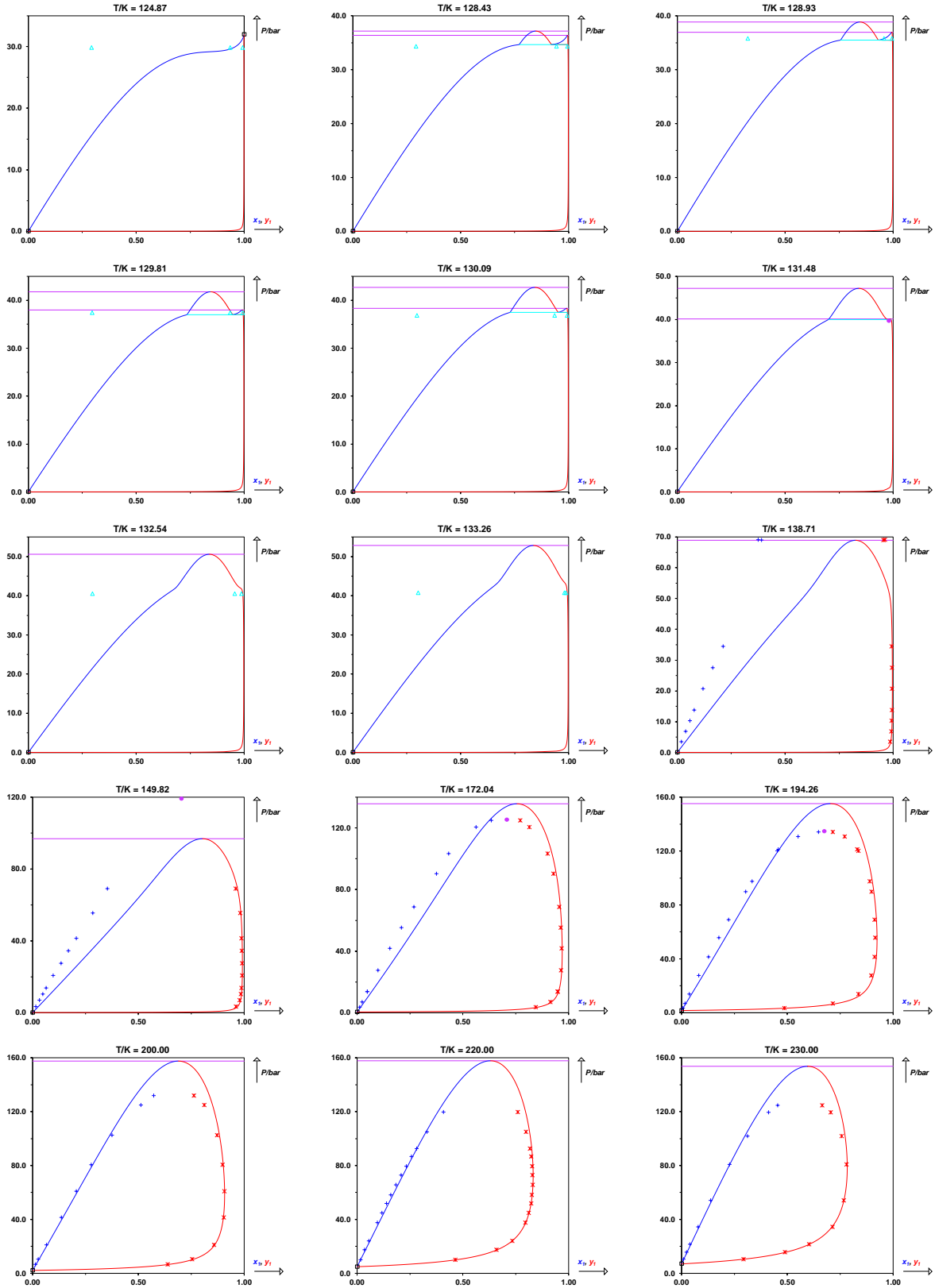
Yu, Paul - Elshayal, I. M. - Lu, Benjamin C.-Y., Liquid-liquid-vapor equilibria in the nitrogen-methane-ethane system, The Canadian Journal of Chemical Engineering. 47 (1969) 495-498. doi:10.1002/cjce.5450470516

T / K	P / bar	x_1^a	x_1^b	y_1
113.70	18.50	0.2548	0.9444	0.9999
113.70	17.96	0.2549	0.9429	0.9999
115.31	18.67	0.2582	0.9431	0.9997
116.48	20.99	0.2599	0.9219	0.9978
116.48	21.01	0.2608	0.9426	0.9972
119.26	23.71	0.2695	0.9398	0.9921
122.04	26.03	0.2846	0.9374	0.9997
124.87	29.87	0.2925	0.9343	0.9931
128.43	34.33	0.2929	0.9430	0.9941
128.93	35.78	0.3261	0.9570	0.9942
129.81	37.41	0.2954	0.9353	0.9935
130.09	36.86	0.2963	0.9347	0.9935
132.54	40.54	0.2962	0.9565	0.9868
133.26	40.75	0.3018	0.9797	0.9873

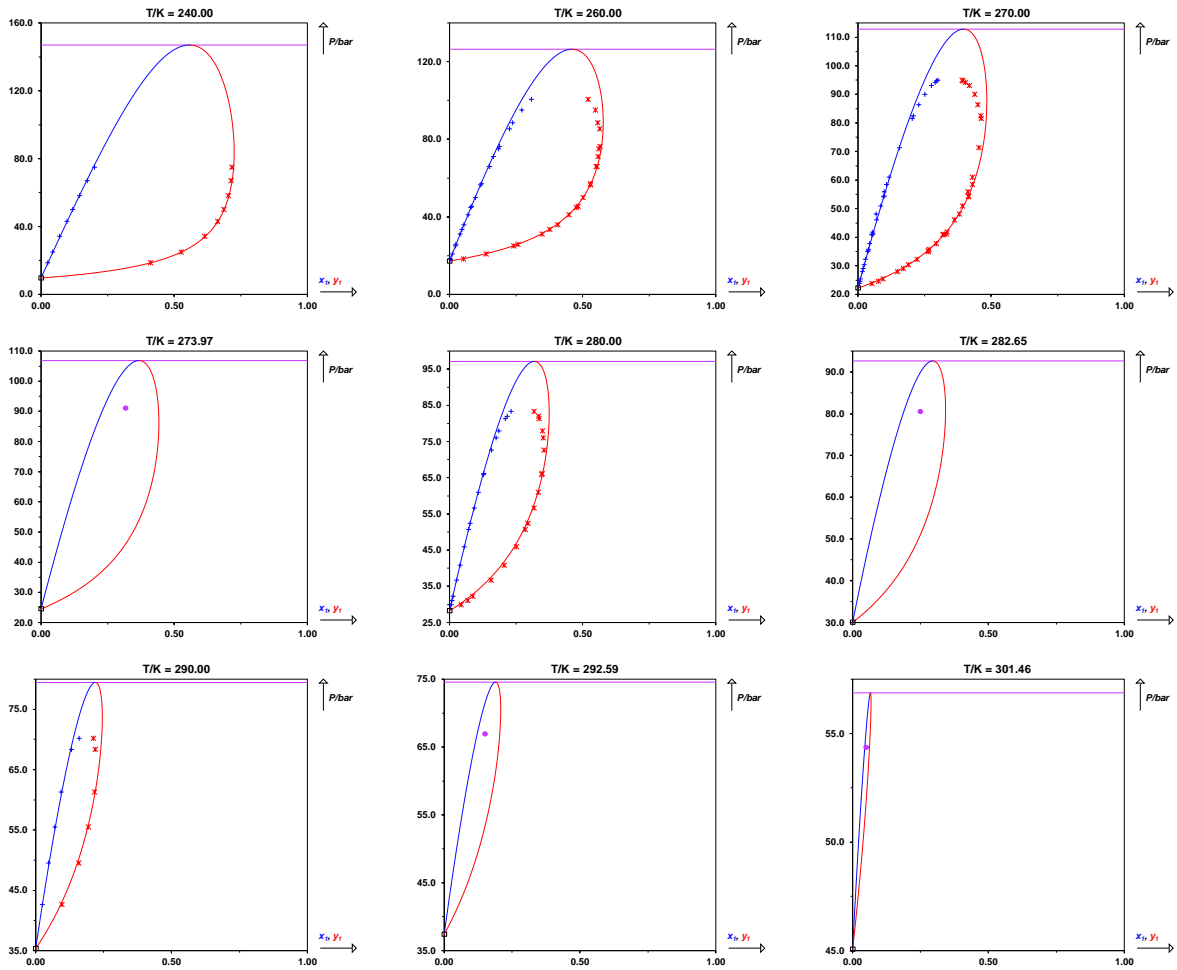
NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NITROGEN (1) + n-PENTANE (2)

CAS	7727-37-9	109-66-0
InChiKey	MDFFN0E0WAXZRQ-UHFFFAOYSA-N	OFBQJSOFQDEBGM-UHFFFAOYSA-N
T_c / K	126.20	469.70
P_c / bar	34.00	33.70
ω	0.038	0.252

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 70.20$

$B/\text{MPa} = 117.6$

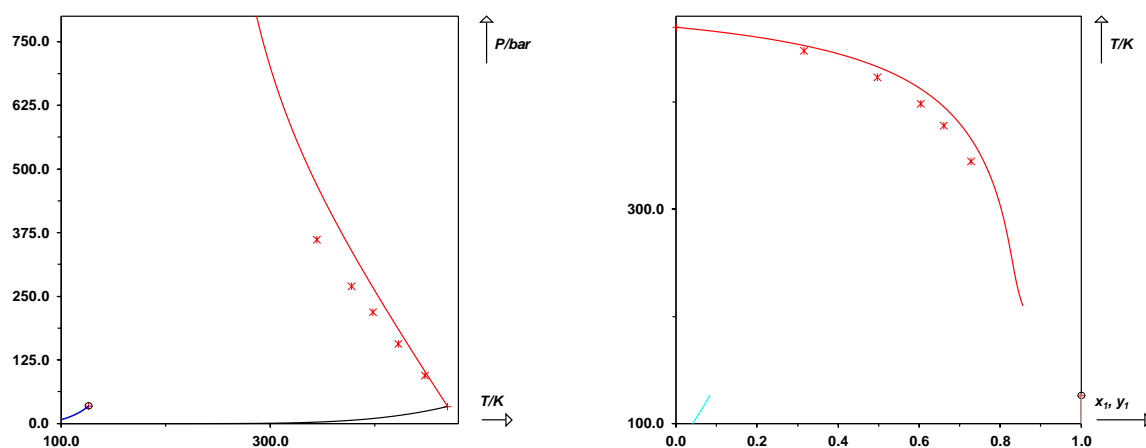
Deviations

MAPE on $x = 7.7\%$

MAPE on $y = 9.3\%$

MAPE on $x_c = 10\%$

MAPE on $P_c = 21\%$



Isothermal phase equilibrium data

Kurata, F. - Swift, G.W., Experimental Measurements of Vapor-Liquid Equilibrium Data for the Ethane - Carbon Dioxide and Nitrogen - n-Pentane Binary Systems, GPA Research Report. (1971) 1-10.

T / K = 144.30

P / bar	x ₁	y ₁
24.19	0.0538	0.9763
33.05	0.0684	0.9864
45.11	0.0865	0.9944
58.04	0.0995	0.9961

Kurata, F. - Swift, G.W., Experimental Measurements of Vapor-Liquid Equilibrium Data for the Ethane - Carbon Dioxide and Nitrogen - n-Pentane Binary Systems, GPA Research Report. (1971) 1-10.

T / K = 172.00

P / bar	x ₁	y ₁
34.63	0.0698	0.9781
64.31	0.1083	0.9949
102.72	0.1533	0.9975
141.86	0.1761	0.9979

Kurata, F. - Swift, G.W., Experimental Measurements of Vapor-Liquid Equilibrium Data for the Ethane - Carbon Dioxide and Nitrogen - n-Pentane Binary Systems, GPA Research Report. (1971) 1-10.

T / K = 199.80

P / bar	x ₁	y ₁
63.68	0.1148	0.9928
136.30	0.1963	0.9969
237.34	0.2916	0.9964
310.71	0.3333	0.9949

Kurata, F. - Swift, G.W., Experimental Measurements of Vapor-Liquid Equilibrium Data for the Ethane - Carbon Dioxide and Nitrogen - n-Pentane Binary Systems, GPA Research Report. (1971) 1-10.

T / K = 227.60

P / bar	x ₁	y ₁
270.03	0.3387	0.9928
200.14	0.2847	0.9949
210.61	0.2962	0.9944
142.16	0.2264	0.9952
66.96	0.1240	0.9910

Kurata, F. - Swift, G.W., Experimental Measurements of Vapor-Liquid Equilibrium Data for the Ethane - Carbon Dioxide and Nitrogen - n-Pentane Binary Systems, GPA Research Report. (1971) 1-10.

T / K = 255.40

P / bar	x ₁	y ₁
279.06	0.3900	0.9900
219.76	0.3233	0.9914
145.87	0.2441	0.9930
73.51	0.1390	0.9908
76.59	0.1424	0.9906

Kalra, Harish - Robinson, Donald B. - Besserer, George J., The equilibrium phase properties of the nitrogen-n-pentane system, Journal of Chemical & Engineering Data. 22 (1977) 215-218. doi:10.1021/je60073a023

T / K = 277.43

P / bar	x ₁	y ₁
16.62	0.0250	0.9810
41.44	0.0550	0.9900
172.64	0.2230	0.9870
207.26	0.2510	0.9850

Kalra, Harish - Robinson, Donald B. - Besserer, George J., The equilibrium phase properties of the nitrogen-n-pentane system, Journal of Chemical & Engineering Data. 22 (1977) 215-218. doi:10.1021/je60073a023

T / K = 310.71

P / bar	x ₁	y ₁
2.503	0.0027	0.5770
4.502	0.0055	0.7570
7.791	0.0110	0.8560
13.72	0.0200	0.9130
21.37	0.0310	0.9400
29.03	0.0430	0.9500
41.30	0.0610	0.9600
63.57	0.0950	0.9680
125.62	0.1850	0.9690
153.20	0.2230	0.9670
180.92	0.2580	0.9640
207.53	0.2880	0.9610

Silva-Oliver, Guadalupe - Elosa-Jiménez, Gaudencio - García-Sánchez, Fernando - Avendaño-Gómez, Juan R., High-pressure vapor-liquid equilibria in the nitrogen-n-pentane system, Fluid Phase Equilibria. 250 (2006) 37-48. doi:10.1016/j.fluid.2006.09.018

T / K = 344.30

P / bar	x ₁	y ₁
16.70	0.0213	0.7845
33.10	0.0478	0.8849
43.80	0.0652	0.9078
66.50	0.1002	0.9292
94.20	0.1427	0.9353
124.70	0.1907	0.9364

NA-NA systems (BAC = 1)

164.10	0.2524	0.9328		197.00	0.4323	0.7377	
209.80	0.3266	0.9233		208.10	0.4806	0.7087	
252.40	0.3921	0.9082		212.30	0.5030	0.6838	
301.60	0.4867	0.8781		218.60	0.6032	0.6032	CRIT
344.80	0.5960	0.8218					
354.70	0.6341	0.7923					
361.60	0.7275	0.7275	CRIT				

Silva-Oliver, Guadalupe - Elosa-Jiménez, Gaudencio - García-Sánchez, Fernando - Avendaño-Gómez, Juan R., High-pressure vapor-liquid equilibria in the nitrogen-n-pentane system, Fluid Phase Equilibria. 250 (2006) 37-48. doi:10.1016/j.fluid.2006.09.018

T / K = 377.90

P / bar	x ₁	y ₁	
17.10	0.0179	0.5334	
21.60	0.0259	0.6269	
30.90	0.0431	0.7285	
54.10	0.0856	0.8190	
88.70	0.1496	0.8625	
126.00	0.2180	0.8688	
164.90	0.2934	0.8590	
197.00	0.3640	0.8470	
210.40	0.3911	0.8368	
225.10	0.4239	0.8224	
241.50	0.4729	0.8014	
257.60	0.5352	0.7686	
263.60	0.5626	0.7449	
266.10	0.5855	0.7277	
269.70	0.6612	0.6612	CRIT

Silva-Oliver, Guadalupe - Elosa-Jiménez, Gaudencio - García-Sánchez, Fernando - Avendaño-Gómez, Juan R., High-pressure vapor-liquid equilibria in the nitrogen-n-pentane system, Fluid Phase Equilibria. 250 (2006) 37-48. doi:10.1016/j.fluid.2006.09.018

T / K = 398.30

P / bar	x ₁	y ₁	
17.00	0.0138	0.3503	
19.70	0.0189	0.4272	
23.10	0.0258	0.4967	
28.00	0.0356	0.5718	
39.00	0.0589	0.6651	
48.10	0.0769	0.7093	
68.10	0.1172	0.7644	
88.10	0.1600	0.7823	
107.10	0.1994	0.7938	
127.10	0.2443	0.7956	
147.60	0.2927	0.7898	
166.90	0.3378	0.7769	
182.40	0.3879	0.7585	

Silva-Oliver, Guadalupe - Elosa-Jiménez, Gaudencio - García-Sánchez, Fernando - Avendaño-Gómez, Juan R., High-pressure vapor-liquid equilibria in the nitrogen-n-pentane system, Fluid Phase Equilibria. 250 (2006) 37-48. doi:10.1016/j.fluid.2006.09.018

T / K = 422.70

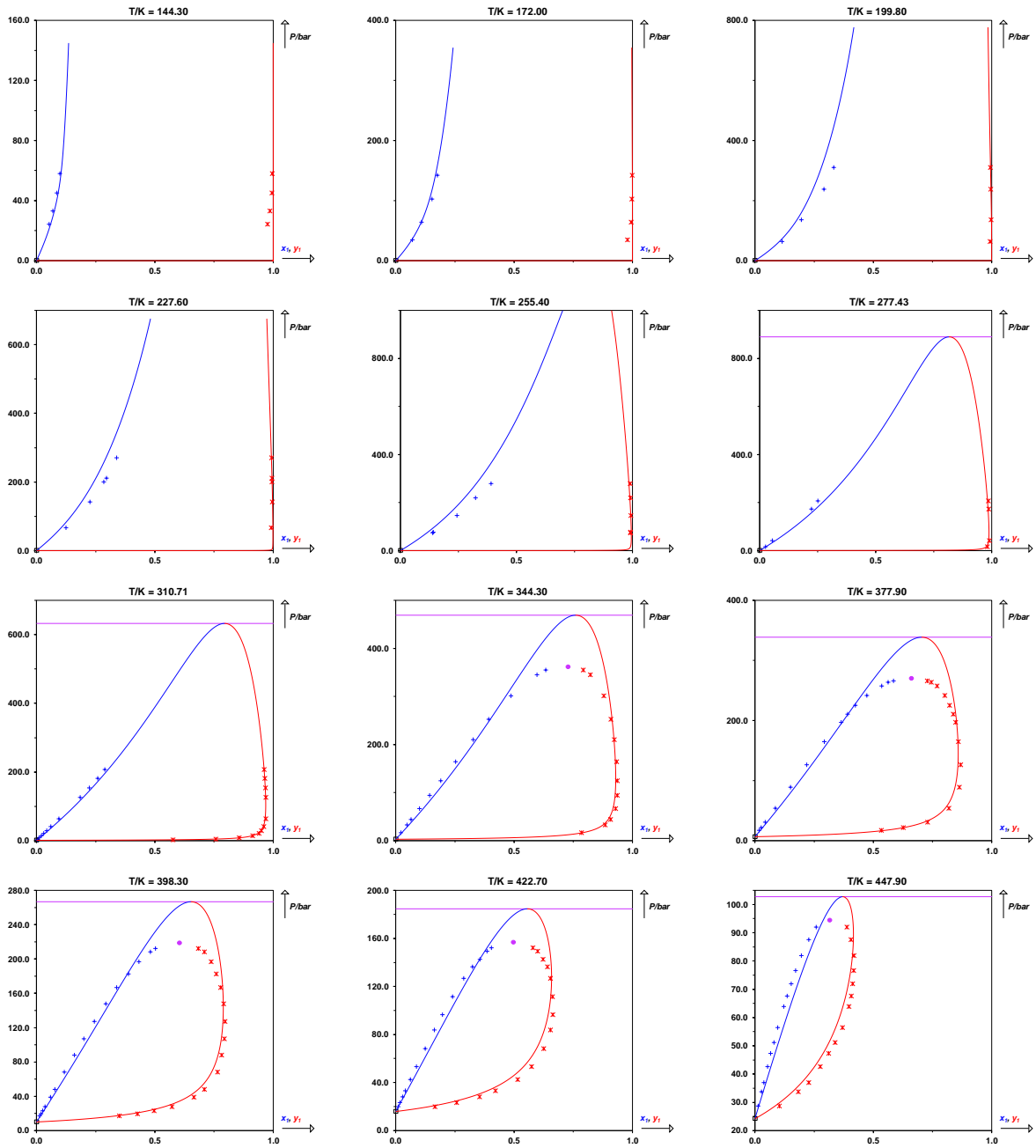
P / bar	x ₁	y ₁	
19.90	0.0100	0.1663	
23.20	0.0175	0.2577	
28.20	0.0293	0.3535	
33.10	0.0402	0.4216	
42.50	0.0624	0.5146	
53.10	0.0875	0.5730	
68.10	0.1241	0.6244	
83.90	0.1633	0.6533	
96.60	0.1979	0.6632	
111.60	0.2402	0.6627	
126.70	0.2864	0.6535	
136.40	0.3237	0.6411	
142.60	0.3551	0.6216	
149.20	0.3854	0.5989	
152.30	0.4034	0.5787	
156.80	0.4967	0.4967	CRIT

Silva-Oliver, Guadalupe - Elosa-Jiménez, Gaudencio - García-Sánchez, Fernando - Avendaño-Gómez, Juan R., High-pressure vapor-liquid equilibria in the nitrogen-n-pentane system, Fluid Phase Equilibria. 250 (2006) 37-48. doi:10.1016/j.fluid.2006.09.018

T / K = 447.90

P / bar	x ₁	y ₁	
28.70	0.0131	0.1035	
33.70	0.0271	0.1833	
37.00	0.0370	0.2270	
42.60	0.0527	0.2762	
47.30	0.0667	0.3109	
51.20	0.0798	0.3383	
56.40	0.0960	0.3702	
63.90	0.1215	0.3970	
67.60	0.1353	0.4062	
71.90	0.1534	0.4132	
76.60	0.1718	0.4175	
81.90	0.1957	0.4183	
87.60	0.2279	0.4054	
92.00	0.2579	0.3888	
94.40	0.3162	0.3162	CRIT

NA-NA systems (BAC = 1)



NITROGEN (1) + n-DECANE (2)

CAS	7727-37-9	124-18-5
InChiKey	MDFFN0E0WAXZRQ-UHFFFAOYSA-N	DIOQZVSQGTUSAI-UHFFFAOYSA-N
T_c / K	126.20	617.70
P_c / bar	34.00	21.10
ω	0.038	0.492

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

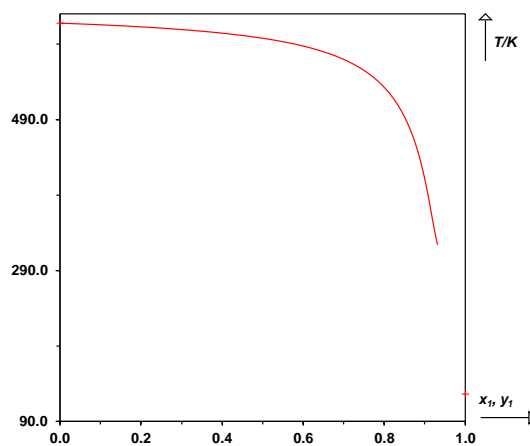
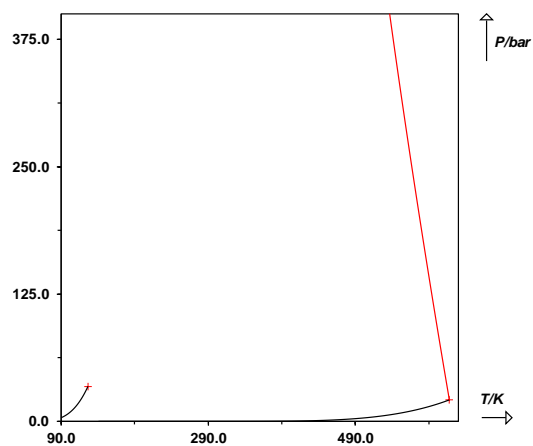
$A/\text{MPa} = 75.73$

$B/\text{MPa} = 151.2$

Deviations

MAPE on $x = 6.5\%$

MAPE on $y = 9.3\%$



Isothermal phase equilibrium data

Azarnoosh, A. - McKetta, J. J., Nitrogen-n-Decane System in the Two-Phase Region., Journal of Chemical & Engineering Data. 8 (1963) 494-496. doi:10.1021/je60019a005

T / K = 310.93

P / bar	x ₁	y ₁
34.48	0.0482	0.9977
46.89	0.0665	0.9993
51.71	0.0710	0.9998
55.16	0.0763	0.9997
68.95	0.0930	0.9997
93.08	0.1242	0.9997
131.00	0.1715	0.9992
144.79	0.1875	0.9997
172.37	0.2130	0.9992
182.70	0.2280	0.9998
248.21	0.2822	0.9993
293.03	0.3180	0.9986
344.74	0.3550	0.9968

García-Sánchez, Fernando - Elosa-Jiménez, Gaudencio - Silva-Oliver, Guadalupe - García-Flores, Blanca E., Vapor-Liquid Equilibrium Data for the Nitrogen + n-Decane System from (344 to 563) K and at Pressures up to 50 MPa, Journal of Chemical & Engineering Data. 54 (2009) 1560-1568. doi:10.1021/je800881t

T / K = 344.60

P / bar	x ₁	y ₁
14.60	0.0195	0.9953
21.20	0.0263	0.9968
29.90	0.0365	0.9975
49.90	0.0592	0.9981
69.90	0.0838	0.9983
94.00	0.1097	0.9984
120.30	0.1343	0.9983
144.40	0.1580	0.9982
170.00	0.1812	0.9980
196.30	0.2025	0.9978
222.30	0.2264	0.9976
244.90	0.2420	0.9974
270.10	0.2630	0.9971
296.10	0.2838	0.9968
320.60	0.2982	0.9965
346.10	0.3162	0.9962
370.90	0.3341	0.9959
395.80	0.3467	0.9955
420.30	0.3617	0.9950
444.30	0.3777	0.9945

470.10	0.3902	0.9941
487.80	0.3985	0.9936
499.10	0.4036	0.9932

García-Sánchez, Fernando - Elosa-Jiménez, Gaudencio - Silva-Oliver, Guadalupe - García-Flores, Blanca E., Vapor-Liquid Equilibrium Data for the Nitrogen + n-Decane System from (344 to 563) K and at Pressures up to 50 MPa, Journal of Chemical & Engineering Data. 54 (2009) 1560-1568. doi:10.1021/je800881t

T / K = 377.40

P / bar	x ₁	y ₁
22.30	0.0307	0.9932
45.50	0.0601	0.9958
50.10	0.0659	0.9960
69.70	0.0902	0.9963
94.80	0.1195	0.9965
119.80	0.1480	0.9964
144.60	0.1748	0.9963
169.80	0.2009	0.9961
194.40	0.2235	0.9958
219.90	0.2474	0.9955
244.60	0.2682	0.9950
269.60	0.2891	0.9945
295.40	0.3106	0.9940
320.40	0.3322	0.9935
344.40	0.3483	0.9932
370.20	0.3679	0.9927
395.00	0.3863	0.9920
420.20	0.4061	0.9913
440.10	0.4205	0.9907
468.90	0.4417	0.9896
482.70	0.4480	0.9887
495.60	0.4580	0.9882

García-Sánchez, Fernando - Elosa-Jiménez, Gaudencio - Silva-Oliver, Guadalupe - García-Flores, Blanca E., Vapor-Liquid Equilibrium Data for the Nitrogen + n-Decane System from (344 to 563) K and at Pressures up to 50 MPa, Journal of Chemical & Engineering Data. 54 (2009) 1560-1568. doi:10.1021/je800881t

T / K = 410.90

P / bar	x ₁	y ₁
19.40	0.0352	0.9823
32.10	0.0564	0.9877
46.20	0.0759	0.9899
54.80	0.0876	0.9906
73.90	0.1145	0.9915
96.20	0.1428	0.9917
120.70	0.1729	0.9916
143.70	0.2003	0.9915

NA-NA systems (BAC = 1)

170.70	0.2317	0.9912
195.80	0.2563	0.9905
219.90	0.2808	0.9900
246.80	0.3078	0.9893
268.70	0.3295	0.9887
294.60	0.3546	0.9877
321.30	0.3786	0.9870
344.70	0.3974	0.9864
370.10	0.4189	0.9852
393.50	0.4391	0.9840
420.10	0.4611	0.9819
444.10	0.4815	0.9808
470.40	0.5046	0.9796
495.00	0.5234	0.9778
503.20	0.5300	0.9771

García-Sánchez, Fernando - Eliosa-Jiménez, Gaudencio - Silva-Oliver, Guadalupe - García-Flores, Blanca E., Vapor-Liquid Equilibrium Data for the Nitrogen + n-Decane System from (344 to 563) K and at Pressures up to 50 MPa, Journal of Chemical & Engineering Data. 54 (2009) 1560-1568. doi:10.1021/je800881t

T / K = 463.70

P / bar	x_1	y_1
18.30	0.0384	0.9299
22.50	0.0461	0.9385
31.90	0.0634	0.9513
45.10	0.0855	0.9604
53.10	0.0993	0.9632
69.90	0.1263	0.9673
94.60	0.1643	0.9709
120.70	0.2001	0.9725
144.80	0.2351	0.9726
219.10	0.3315	0.9705
244.60	0.3656	0.9688
270.60	0.3939	0.9673
294.30	0.4254	0.9653
319.60	0.4544	0.9629
345.80	0.4851	0.9611
369.80	0.5149	0.9578
395.40	0.5433	0.9532
421.00	0.5728	0.9502
444.60	0.5999	0.9464
472.70	0.6285	0.9381
498.40	0.6553	0.9313

García-Sánchez, Fernando - Eliosa-Jiménez, Gaudencio - Silva-Oliver, Guadalupe - García-Flores, Blanca E., Vapor-Liquid Equilibrium Data for the Nitrogen + n-Decane System from (344 to 563) K and at Pressures up to 50 MPa,

Journal of Chemical & Engineering Data. 54 (2009) 1560-1568. doi:10.1021/je800881t

T / K = 503.00

P / bar	x_1	y_1
15.20	0.0279	0.7515
21.40	0.0406	0.8122
27.50	0.0535	0.8477
36.40	0.0705	0.8779
45.30	0.0878	0.8957
56.10	0.1072	0.9084
69.80	0.1317	0.9179
94.90	0.1758	0.9289
119.50	0.2192	0.9358
191.20	0.3370	0.9387
219.30	0.3802	0.9368
243.80	0.4186	0.9339
267.40	0.4561	0.9309
296.00	0.5012	0.9239
320.50	0.5409	0.9161
348.80	0.5878	0.9001
372.50	0.6317	0.8849
402.20	0.7053	0.8487

García-Sánchez, Fernando - Eliosa-Jiménez, Gaudencio - Silva-Oliver, Guadalupe - García-Flores, Blanca E., Vapor-Liquid Equilibrium Data for the Nitrogen + n-Decane System from (344 to 563) K and at Pressures up to 50 MPa, Journal of Chemical & Engineering Data. 54 (2009) 1560-1568. doi:10.1021/je800881t

T / K = 533.50

P / bar	x_1	y_1
10.40	0.0152	0.4458
14.90	0.0260	0.5759
21.00	0.0402	0.6677
26.80	0.0525	0.7204
36.50	0.0735	0.7755
45.50	0.0938	0.8069
55.50	0.1167	0.8322
69.50	0.1452	0.8538
93.70	0.1955	0.8752
119.50	0.2464	0.8872
144.80	0.2984	0.8899
169.60	0.3452	0.8905
195.10	0.3949	0.8854
220.80	0.4455	0.8766
244.80	0.4988	0.8655
270.30	0.5610	0.8445
296.60	0.6239	0.7848

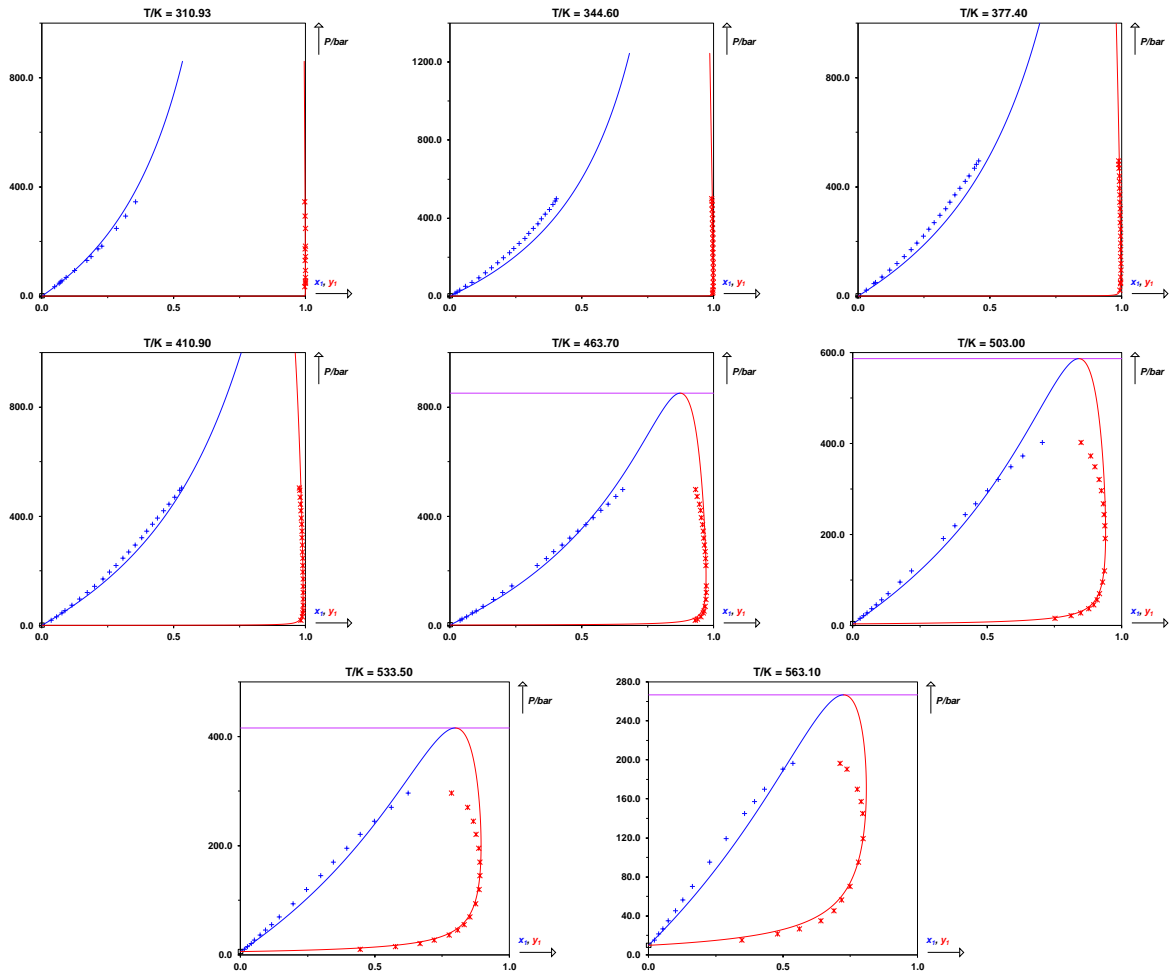
García-Sánchez, Fernando - Eliosa-Jiménez, Gaudencio - Silva-Oliver, Guadalupe - García-Flores, Blanca E., Vapor-

Liquid Equilibrium Data for the Nitrogen + n-Decane System from (344 to 563) K and at Pressures up to 50 MPa, Journal of Chemical & Engineering Data. 54 (2009) 1560-1568. doi:10.1021/je800881t

T / K = 563.10

P / bar	x_1	y_1
15.30	0.0212	0.3473
21.40	0.0371	0.4794
26.60	0.0526	0.5604
35.00	0.0735	0.6402
45.40	0.0997	0.6895
56.20	0.1275	0.7179
70.10	0.1632	0.7488
95.00	0.2265	0.7808
119.40	0.2891	0.7975
144.90	0.3566	0.7964
157.20	0.3945	0.7900
170.00	0.4305	0.7766
190.50	0.5000	0.7375
196.40	0.5373	0.7120

NA-NA systems (BAC = 1)



ETHYLENE (1) + XENON (2)

CAS	74-85-1	7440-63-3
InChiKey	VGGSQFUCUMXWEO-UHFFFAOYSA-N	FHNFHKCVQCLJFQ-UHFFFAOYSA-N
T_c / K	282.34	289.74
P_c / bar	50.41	58.40
ω	0.086	0.000

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 24.59$

$B/\text{MPa} = -26.63$

Deviations

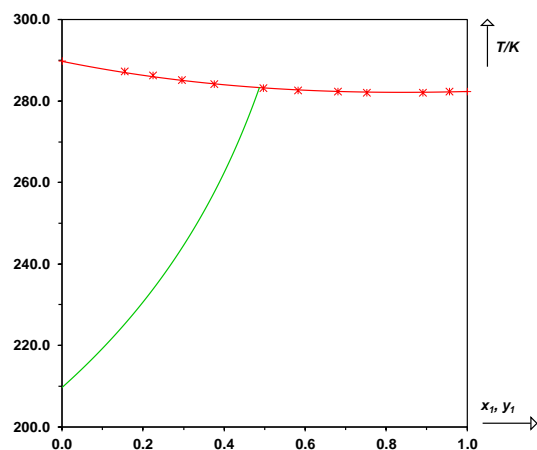
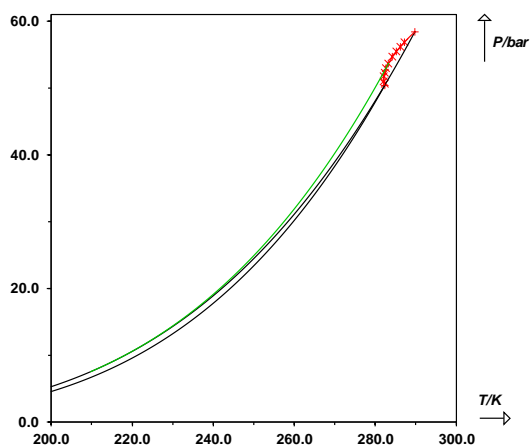
MAPE on $x = 13\%$

MAPE on $y = 12\%$

MAPE on $x_c = 4.6\%$

MAPE on $P_c = 0.12\%$

MAPE on $h^M = 80\%$



-----			25.55	0.3584	0.3577
Isothermal phase equilibrium data			25.33	0.2576	0.2659
-----			24.83	0.0989	0.1084
Calado, J.C.G. - Soares, V.A.M., Thermodynamics of liquid ethylene + xenon at 161.38 K, The Journal of Chemical Thermodynamics. 9 (1977) 911-913. doi:10.1016/0021-9614(77)90176-8					
T / K = 161.38			Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037		
P / bar	x ₁	y ₁	T / K = 262.18		
0.6896	0.8683	0.7860	P / bar	x ₁	y ₁
0.7418	0.7371	0.6356	32.03	0.9518	0.9475
0.7891	0.5568	0.4778	32.80	0.8178	0.8068
0.8103	0.4619	0.4022	33.45	0.6466	0.6382
0.8275	0.3302	0.3018	33.51	0.6275	0.6193
0.8337	0.2309	0.2230	33.53	0.6170	0.6086
0.8298	0.0905	0.0972	33.64	0.5339	0.5290
Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037			33.68	0.4993	0.4957
T / K = 203.03			33.42	0.2274	0.2355
P / bar	x ₁	y ₁	33.22	0.1592	0.1603
5.709	0.7473	0.7094	32.83	0.0657	0.0664
5.916	0.5699	0.5368	Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037		
5.992	0.4866	0.4645	T / K = 269.54		
6.033	0.4273	0.4159	P / bar	x ₁	y ₁
6.047	0.2013	0.2017	38.44	0.8834	0.8771
5.964	0.0966	0.1108	38.68	0.8455	0.8369
Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037			39.03	0.7786	0.7682
T / K = 224.03			39.27	0.7230	0.7138
P / bar	x ₁	y ₁	39.52	0.6517	0.6420
11.91	0.6723	0.6362	39.59	0.6298	0.6224
12.19	0.4198	0.4162	39.78	0.5347	0.5302
12.20	0.2306	0.2346	39.81	0.5007	0.4985
12.14	0.1758	0.1779	39.83	0.4518	0.4515
Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037			39.76	0.3489	0.3505
T / K = 250.16			39.73	0.3237	0.3279
P / bar	x ₁	y ₁	39.59	0.2657	0.2710
23.88	0.9117	0.9081	39.36	0.1919	0.2064
25.38	0.5522	0.5457	38.85	0.0930	0.0978
25.48	0.4915	0.4903	Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037		
25.56	0.4587	0.4585	T / K = 274.67		
25.57	0.4166	0.4167	P / bar	x ₁	y ₁

NA-NA systems (BAC = 1)

44.60	0.5298	0.5280
44.62	0.4695	0.4700
44.49	0.3392	0.3423
44.40	0.3015	0.3144
44.08	0.2155	0.2248
43.79	0.1539	0.1634

Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037

T / K = 282.08

P / bar	x ₁	y ₁	
50.47	0.9612	0.9549	
50.97	0.8964	0.8952	
51.01	0.8900	0.8900	CRIT
51.77	0.7520	0.7520	CRIT
51.79	0.7456	0.7437	
51.93	0.7247	0.7219	
52.06	0.6882	0.6859	
52.10	0.6747	0.6724	
52.24	0.6234	0.6195	
52.30	0.5793	0.5780	
52.37	0.4831	0.4834	
52.31	0.4041	0.4120	
51.90	0.2819	0.2904	
51.30	0.1630	0.1679	
50.62	0.0676	0.0750	

Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037

T / K = 282.61

P / bar	x ₁	y ₁	
52.93	0.5820	0.5820	CRIT
52.95	0.5742	0.5735	
52.70	0.3180	0.3206	
52.27	0.2222	0.2262	
51.22	0.0698	0.0731	

Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037

T / K = 283.17

P / bar	x ₁	y ₁	
53.61	0.4960	0.4960	CRIT
53.59	0.4698	0.4695	
53.55	0.4261	0.4254	
53.47	0.3789	0.3795	

53.15	0.2923	0.2954
52.57	0.1794	0.1876
51.95	0.0939	0.0978

Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037

T / K = 284.20

P / bar	x ₁	y ₁	
54.70	0.3750	0.3750	CRIT
54.50	0.3096	0.3118	
54.23	0.2579	0.2606	
53.88	0.1964	0.1996	
53.21	0.1037	0.1075	

Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037

T / K = 285.19

P / bar	x ₁	y ₁	
55.44	0.2950	0.2950	CRIT
55.39	0.2825	0.2839	
55.02	0.2184	0.2211	
54.52	0.1397	0.1476	
54.17	0.0949	0.1013	

Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037

T / K = 286.19

P / bar	x ₁	y ₁	
56.17	0.2240	0.2240	CRIT
56.12	0.2108	0.2152	
55.99	0.1914	0.1941	
55.56	0.1337	0.1364	
55.00	0.0681	0.0701	

Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. - Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-1152. doi:10.1021/j100278a037

T / K = 287.18

P / bar	x ₁	y ₁	
56.85	0.1550	0.1550	CRIT
56.77	0.1408	0.1422	
56.68	0.1301	0.1319	
56.20	0.0739	0.0759	
55.61	0.0148	0.0153	

Enthalpy of mixing

Lainez, A - Rebelo, L.P.N - Calado, J.C.G - Streett, W.B -
Zollweg, J.A, Excess enthalpies of liquid (ethene + xenon)
at 162.9 K, The Journal of Chemical Thermodynamics. 19
(1987) 35-38. doi:10.1016/0021-9614(87)90159-5

T / K = 162.90

P / bar = UNKNOWN (1.0132)

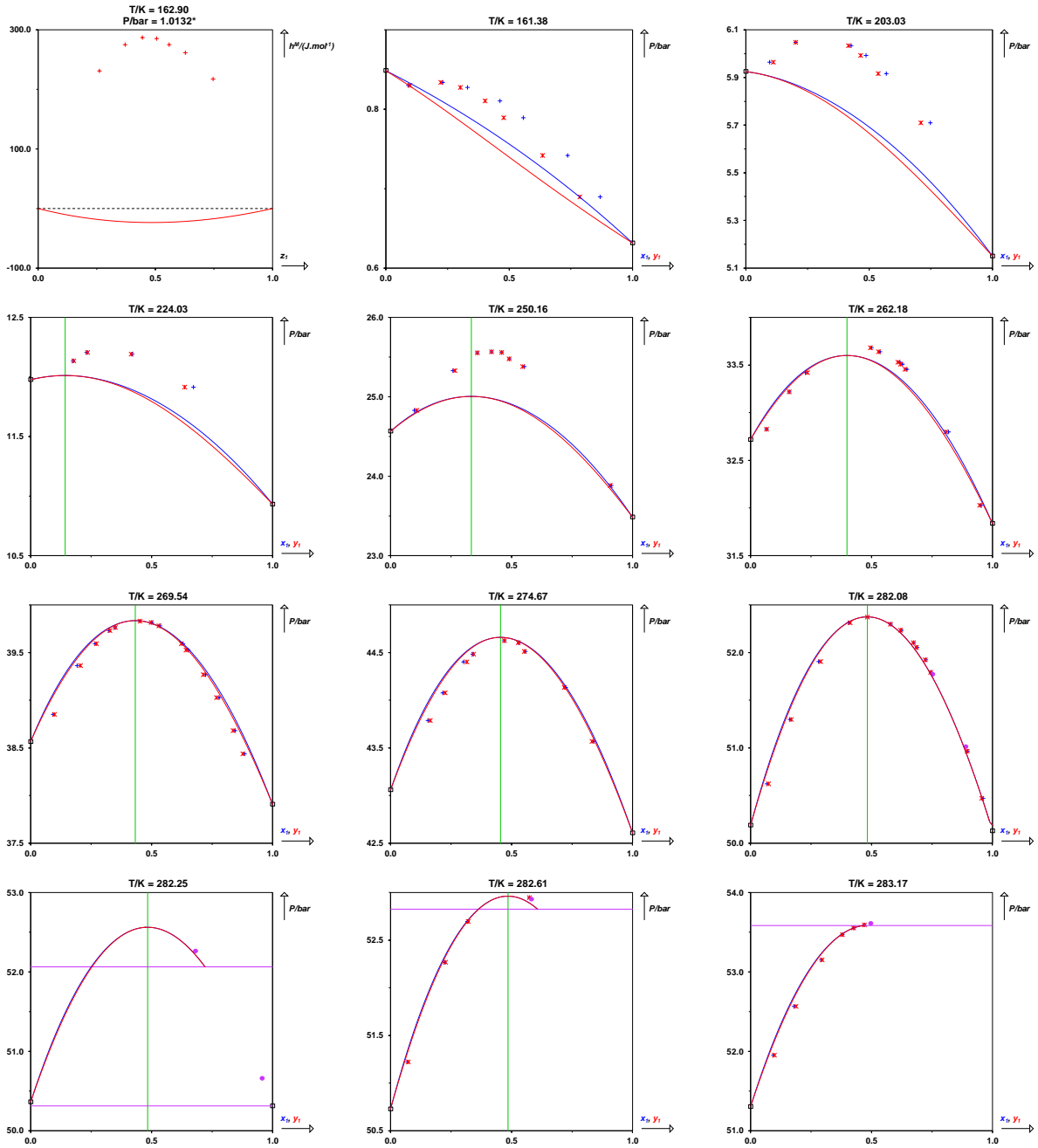
$h^M / \text{J.mol}^{-1}$	x_1
217.10	0.7457
261.66	0.6279
274.85	0.5581
285.24	0.5050
286.86	0.4443
275.14	0.3715
230.81	0.2606

Critical point

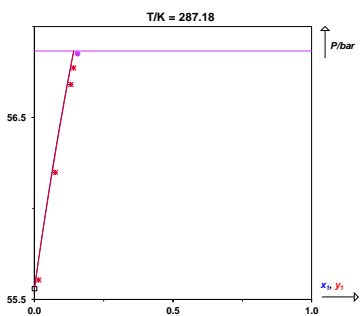
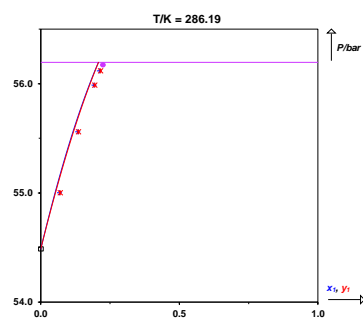
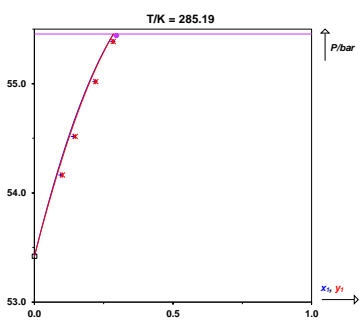
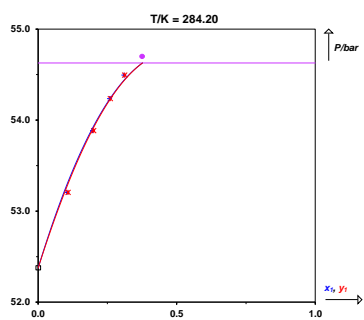
Nunes da Ponte, M. - Chokappa, D. - Calado, J.C.G. -
Zollweg, J. - Streett, W.B., Vapor-liquid equilibrium in the
xenon + ethene system, J. Phys. Chem. 90 (1986) 1147-
1152. doi:10.1021/j100278a037

T / K	P / bar	x_1
282.25	50.66	0.9560
282.25	52.26	0.6810

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



ETHANE (1) + PROPANE (2)

CAS	74-84-0	74-98-6
InChiKey	OTMSDBZUPAUEDD-UHFFFAOYSA-N	ATUOYWVHBWRKTHZ-UHFFFAOYSA-N
T_c / K	305.32	369.83
P_c / bar	48.72	42.48
ω	0.099	0.152

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -1.878$

$B/\text{MPa} = 9.150$

Deviations

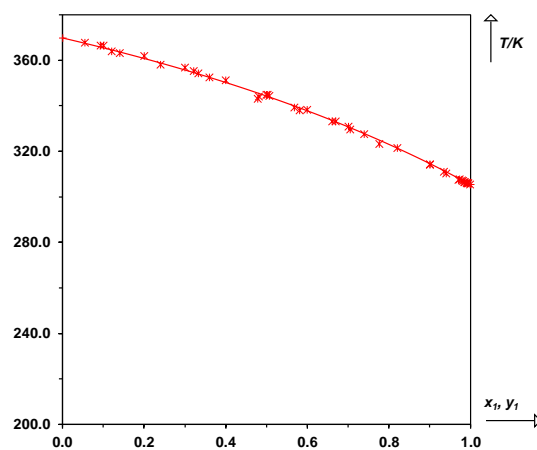
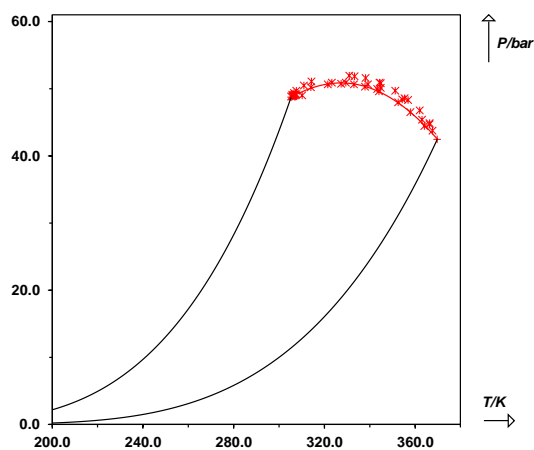
MAPE on $x = 4.1\%$

MAPE on $y = 5.7\%$

MAPE on $x_c = 4.5\%$

MAPE on $P_c = 1.1\%$

MAPE on $h^M = 23\%$



-----			1.149	0.4550	0.8900
Isothermal phase equilibrium data			1.269	0.5160	0.9120
-----			1.461	0.6000	0.9350
Djordjevich, Ljubomir - Budenholzer, R. A., Vapor-liquid equilibrium data for ethane-propane system at low temperatures, Journal of Chemical & Engineering Data. 15 (1970) 10-12. doi:10.1021/je60044a020			1.669	0.6780	0.9560
T / K = 127.59			1.849	0.7490	0.9690
P / bar	x ₁	y ₁	2.116	0.8700	0.9870
0.0002	0.0061	0.3310	2.320	0.9580	0.9960
0.0007	0.0520	0.7875	Skripka, V.G. - Nikitina, I.E. - Zhdanovich, L.A. - Sirotin, A.G. - Ben'yaminovich, O.A., Liquid-vapor phase equilibria at low temperatures in binary systems formed by components of natural gas, Gazov. Promst. 15 (1970) 35-36.		
0.0013	0.1180	0.8980	T / K = 213.15		
0.0023	0.2144	0.9569	P / bar	y ₁	
0.0030	0.2840	0.9725	0.4609	0.0500	
0.0040	0.3840	0.9820	0.6276	0.2000	
0.0048	0.4664	0.9860	0.8532	0.4000	
0.0054	0.5300	0.9890	1.079	0.6000	
0.0072	0.7060	0.9940	1.471	0.8000	
0.0080	0.7850	0.9950	2.648	0.9500	
0.0088	0.8650	0.9968	Skripka, V.G. - Nikitina, I.E. - Zhdanovich, L.A. - Sirotin, A.G. - Ben'yaminovich, O.A., Liquid-vapor phase equilibria at low temperatures in binary systems formed by components of natural gas, Gazov. Promst. 15 (1970) 35-36.		
0.0093	0.9175	0.9980	T / K = 213.15		
Hirata, M. - Suda, S. - Hakuta, T. - Nagahama, K., Light hydrocarbon vapor-liquid equilibria, Mem. Fac. Technol. Tokyo Metropol. Univ. 19 (1969) 103-122.			P / bar	x ₁	
T / K = 196.85			0.5590	0.0500	
P / bar	x ₁	y ₁	1.000	0.2000	
0.2440	0.0380	0.2710	1.677	0.4000	
0.3506	0.1100	0.5630	2.393	0.6000	
0.4400	0.1640	0.6780	3.119	0.8000	
0.5800	0.2430	0.7710	3.609	0.9500	
0.6893	0.3020	0.8110	Blanc, Claude J. - Setier, Jean Claude B., Vapor-liquid equilibria for the ethane-propane system at low temperature, Journal of Chemical & Engineering Data. 33 (1988) 111-115. doi:10.1021/je00052a015		
0.8039	0.3620	0.8530	T / K = 225.00		
1.053	0.5120	0.9230	P / bar	x ₁	
1.236	0.6110	0.9500	0.7820	0.0006	
1.367	0.6920	0.9620	0.9930	0.0440	
1.452	0.7500	0.9720	1.001	0.0447	
1.632	0.8550	0.9850	1.218	0.0906	
1.805	0.9600	0.9960	1.227	0.0936	
Hirata, M. - Suda, S. - Hakuta, T. - Nagahama, K., Light hydrocarbon vapor-liquid equilibria, Mem. Fac. Technol. Tokyo Metropol. Univ. 19 (1969) 103-122.			1.239	0.0950	
T / K = 202.15			1.911	0.2305	
P / bar	x ₁	y ₁	1.928	0.2357	
0.2840	0.0290	0.2270	2.130	0.2844	
0.3226	0.0500	0.3410	2.216	0.2943	
0.4213	0.1050	0.5080	0.7694		
0.5626	0.1710	0.6530	0.0045		
0.8626	0.3150	0.8070	0.2730		
1.019	0.4000	0.8560	0.2799		
			0.4404		
			0.4501		
			0.4623		
			0.6865		
			0.6882		
			0.7370		
			0.7694		

NA-NA systems (BAC = 1)

2.235	0.2969	0.7704	3.395	0.1939	0.5796
2.334	0.3305	0.7871	3.461	0.2027	0.5925
2.786	0.4294	0.8394	3.510	0.2041	0.5996
2.799	0.4213	0.8439	4.394	0.3079	0.7206
3.351	0.5339	0.8908	4.475	0.3167	0.7226
3.363	0.5314	0.8920	4.538	0.3178	0.7309
3.586	0.5752	0.9096	5.370	0.4202	0.8016
3.600	0.5762	0.9055	5.466	0.4280	0.8060
4.688	0.7766	0.9590	5.535	0.4303	0.8115
4.703	0.7822	0.9613	6.548	0.5435	0.8663

Skripka, V.G. - Nikitina, I.E. - Zhdanovich, L.A. - Sirotin, A.G. - Ben'yaminovich, O.A., Liquid-vapor phase equilibria at low temperatures in binary systems formed by components of natural gas, *Gazov. Promst.* 15 (1970) 35-36.

T / K = 233.15

P / bar	y_1
1.216	0.0500
1.373	0.2000
1.628	0.4000
2.197	0.6000
3.501	0.8000
6.080	0.9500

Skripka, V.G. - Nikitina, I.E. - Zhdanovich, L.A. - Sirotin, A.G. - Ben'yaminovich, O.A., Liquid-vapor phase equilibria at low temperatures in binary systems formed by components of natural gas, *Gazov. Promst.* 15 (1970) 35-36.

T / K = 233.15

P / bar	x_1
1.412	0.0500
2.295	0.2000
3.501	0.4000
4.786	0.6000
6.296	0.8000
7.424	0.9500

Blanc, Claude J. - Setier, Jean Claude B., Vapor-liquid equilibria for the ethane-propane system at low temperature, *Journal of Chemical & Engineering Data.* 33 (1988) 111-115. doi:10.1021/je00052a015

T / K = 245.00

P / bar	x_1	y_1
2.320	0.0633	0.3072
2.337	0.0647	0.3194
2.358	0.0667	0.3255
2.548	0.0917	0.3640
2.581	0.0955	0.3559
2.624	0.1004	0.4216
2.648	0.1031	0.4350

6.616	0.5497	0.8706
6.678	0.5519	0.8709
9.349	0.8339	0.9563
9.722	0.8756	0.9668
9.725	0.8733	0.9664
9.730	0.8774	0.9674
10.03	0.9014	0.9749
10.08	0.9059	0.9762
10.11	0.9084	0.9767

Blanc, Claude J. - Setier, Jean Claude B., Vapor-liquid equilibria for the ethane-propane system at low temperature, *Journal of Chemical & Engineering Data.* 33 (1988) 111-115. doi:10.1021/je00052a015

T / K = 255.40

P / bar	x_1	y_1
3.634	0.0953	0.3380
3.637	0.0946	0.3389
4.282	0.1534	0.4648
4.289	0.1536	0.4670
5.197	0.2376	0.5986
5.210	0.2371	0.6015
5.797	0.2923	0.6589
5.807	0.2929	0.6604
5.821	0.2916	0.6593
6.669	0.3672	0.7279
6.679	0.3675	0.7299
6.712	0.3692	0.7294
7.649	0.4494	0.7876
7.664	0.4491	0.7878
7.822	0.4643	0.7985
7.945	0.4760	0.8048
9.330	0.5871	0.8613
9.387	0.5921	0.8632
9.927	0.6325	0.8814
9.942	0.6339	0.8839
10.06	0.6376	0.8846
11.11	0.7246	0.9167
12.08	0.7955	0.9405
12.08	0.7982	0.9415

NA-NA systems (BAC = 1)

12.12 0.7983 0.9406
 13.21 0.8780 0.9642
 13.23 0.8782 0.9634

Clark, Alisdair Q - Stead, Keith, (Vapour + liquid) phase equilibria of binary, ternary, and quaternary mixtures of CH₄, C₂H₆, C₃H₈, C₄H₁₀, and CO₂, The Journal of Chemical Thermodynamics. 20 (1988) 413-427. doi:10.1016/0021-9614(88)90178-4

T / K = 260.00

P / bar	x ₁	y ₁
3.620	0.0600	0.1700
5.017	0.1680	0.4520
6.336	0.2830	0.6120
9.366	0.5010	0.7840
11.56	0.6720	0.8990
14.10	0.8550	0.9680
15.37	0.9290	0.9800

Hirata, M. - Suda, S. - Hakuta, T. - Nagahama, K., Light hydrocarbon vapor-liquid equilibria, Mem. Fac. Technol. Tokyo Metropol. Univ. 19 (1969) 103-122.

T / K = 273.15

P / bar	x ₁	y ₁
7.034	0.1692	0.4140
9.032	0.2889	0.5628
10.95	0.3968	0.6702
15.05	0.6372	0.8419
16.84	0.7117	0.8814

Kahre, LeRoy C., Liquid density of light hydrocarbon mixtures, Journal of Chemical & Engineering Data. 18 (1973) 267-270. doi:10.1021/jc60058a030

T / K = 288.75

P / bar	x ₁	y ₁
9.656	0.1078	0.2795
11.68	0.2003	0.4376
14.22	0.3094	0.5750
16.52	0.4037	0.6659
18.61	0.4855	0.7290
19.79	0.5346	0.7621
22.00	0.6209	0.8134
23.62	0.6810	0.8463
26.82	0.7867	0.9009
29.20	0.8635	0.9365

Pöll, Heinrich - Huemer, Hans - Moser, Franz, Eine Apparatur zur Bestimmung von Dampf-Flüssigkeits-Gleichgewichten unter erhöhtem Druck, Monatshefte für Chemie. 111 (1980) 1159-1164. doi:10.1007/BF00909673

T / K = 303.15

P / bar	x ₁	y ₁
---------	----------------	----------------

12.96	0.1034	0.2430
15.11	0.1807	0.3789
16.80	0.2375	0.4574
20.04	0.3426	0.5958
20.86	0.3717	0.6101
27.31	0.5493	0.7613
31.48	0.6577	0.8186
39.39	0.8557	0.9119
42.17	0.9216	0.9551

Miksovsky, J. - Wichterle, I., Liquid-vapor equilibrium. LXX. Vapor-liquid equilibria in the ethane-propane system at high pressures, Collect. Czech. Chem. Commun. 40 (1975) 365-370. doi:10.1135/cccc19750365

T / K = 303.15

P / bar	x ₁	y ₁
11.59	0.0245	0.0689
12.26	0.0538	0.1409
13.98	0.1244	0.2890
15.94	0.1748	0.3848
19.89	0.3217	0.5602
23.77	0.4392	0.6641
30.23	0.6180	0.7837
33.79	0.7085	0.8332
37.63	0.8075	0.8881
41.05	0.8813	0.9280
42.43	0.9124	0.9459
43.55	0.9374	0.9597
44.55	0.9527	0.9686
45.47	0.9759	0.9838
45.52	0.9763	0.9838
46.20	0.9908	0.9935
46.42	0.9947	0.9961
46.44	0.9948	0.9962

Matschke, D. E. - Thodos, G., Vapor-liquid equilibria for the ethane-propane system, J. Chem. Eng. Data. 7 (1962) 232-234. doi:10.1021/jc60013a022

T / K = 310.93

P / bar	x ₁	y ₁
13.79	0.0313	0.0789
17.24	0.1490	0.3100
20.68	0.2550	0.4550
24.13	0.3530	0.5580
27.58	0.4470	0.6380
31.03	0.5350	0.7040
34.47	0.6220	0.7640
37.92	0.7050	0.8160
41.37	0.7810	0.8610
44.82	0.8430	0.8940

NA-NA systems (BAC = 1)

48.26	0.8950	0.9220		27.58	0.0253	0.0480	
50.44	0.9350	0.9350	CRIT	31.03	0.1040	0.1760	
				34.47	0.1740	0.2700	
				37.92	0.2410	0.3430	
				41.37	0.3050	0.4030	
				44.82	0.3690	0.4570	
				48.26	0.4320	0.5020	
				49.99	0.4630	0.5160	
				50.88	0.5060	0.5060	CRIT

Miksovsky, J. - Wichterle, I., Liquid-vapor equilibrium. LXX. Vapor-liquid equilibria in the ethane-propane system at high pressures, Collect. Czech. Chem. Commun. 40 (1975) 365-370. doi:10.1135/ccccc19750365

T / K = 323.15

P / bar	x ₁	y ₁	
18.12	0.0271	0.0600	
19.51	0.0665	0.1385	
20.03	0.0778	0.1599	
21.33	0.1097	0.2168	
22.79	0.1466	0.2661	
26.08	0.2287	0.3779	
26.54	0.2363	0.3877	
27.68	0.2660	0.4208	
30.07	0.3217	0.4848	
34.33	0.4278	0.5870	
37.56	0.5015	0.6460	
41.14	0.5653	0.6967	
45.94	0.6666	0.7576	
47.90	0.7035	0.7715	
49.38	0.7332	0.7786	
50.16	0.7504	0.7823	
50.59	0.7586	0.7810	
50.78	0.7621	0.7765	
50.87	0.7755	0.7755	CRIT

Matschke, D. E. - Thodos, G., Vapor-liquid equilibria for the ethane-propane system, J. Chem. Eng. Data. 7 (1962) 232-234. doi:10.1021/je60013a022

T / K = 355.37

P / bar	x ₁	y ₁	
34.47	0.0356	0.0570	
36.20	0.0693	0.1060	
37.92	0.1020	0.1490	
39.65	0.1350	0.1880	
41.37	0.1680	0.2250	
43.09	0.2010	0.2620	
44.82	0.2350	0.2940	
46.54	0.2700	0.3240	
48.26	0.3090	0.3310	
48.61	0.3215	0.3215	CRIT

Miksovsky, J. - Wichterle, I., Liquid-vapor equilibrium. LXX. Vapor-liquid equilibria in the ethane-propane system at high pressures, Collect. Czech. Chem. Commun. 40 (1975) 365-370. doi:10.1135/ccccc19750365

T / K = 363.16

P / bar	x ₁	y ₁	
38.40	0.0116	0.0173	
38.99	0.0214	0.0307	
39.97	0.0395	0.0543	
41.02	0.0566	0.0746	
41.88	0.0716	0.0912	
43.68	0.1017	0.1216	
44.74	0.1224	0.1367	
45.26	0.1333	0.1405	
45.34	0.1402	0.1402	CRIT

Matschke, D. E. - Thodos, G., Vapor-liquid equilibria for the ethane-propane system, J. Chem. Eng. Data. 7 (1962) 232-234. doi:10.1021/je60013a022

T / K = 366.48

P / bar	x ₁	y ₁
39.99	0.0065	0.0095
40.68	0.0193	0.0275
41.37	0.0320	0.0446
42.06	0.0445	0.0602

Matschke, D. E. - Thodos, G., Vapor-liquid equilibria for the ethane-propane system, J. Chem. Eng. Data. 7 (1962) 232-234. doi:10.1021/je60013a022

T / K = 333.15

P / bar	x ₁	y ₁	
24.13	0.0711	0.1400	
27.58	0.1520	0.2670	
31.03	0.2300	0.3670	
34.47	0.3050	0.4480	
37.92	0.3780	0.5150	
41.37	0.4480	0.5730	
44.82	0.5150	0.6180	
48.26	0.5810	0.6550	
49.99	0.6130	0.6720	
51.71	0.6520	0.6700	
51.85	0.6685	0.6685	CRIT

Matschke, D. E. - Thodos, G., Vapor-liquid equilibria for the ethane-propane system, J. Chem. Eng. Data. 7 (1962) 232-234. doi:10.1021/je60013a022

T / K = 344.26

P / bar	x ₁	y ₁
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NA-NA systems (BAC = 1)

42.75	0.0566	0.0742		-18.00	0.9525
43.44	0.0682	0.0869		-3.000	0.9842
44.13	0.0791	0.0949			
44.47	0.0846	0.0953			
44.71	0.0930	0.0930	CRIT		

Miksovsky, J. - Wichterle, I., Liquid-vapor equilibrium. LXX. Vapor-liquid equilibria in the ethane-propane system at high pressures, Collect. Czech. Chem. Commun. 40 (1975) 365-370. doi:10.1135/cccc19750365

T / K = 367.66

P / bar	x ₁	y ₁	
41.14	0.0056	0.0076	
41.86	0.0179	0.0233	
42.46	0.0279	0.0346	
43.20	0.0413	0.0472	
43.56	0.0492	0.0531	
43.71	0.0552	0.0552	CRIT

Enthalpy of mixing

Ott, J.B. - Brown, P.R. - Moore, J.D. - Lewellen, A.C., Excess molar enthalpies and excess molar volumes for (propane + ethane) over the temperature range from 273.15 K to 373.15 K and the pressure range from 5 MPa to 15 MPa, The Journal of Chemical Thermodynamics. 29 (1997) 149-178. doi:10.1006/jcht.1996.0144

T / K = 273.15

P / bar = 50.00

h^M / J.mol⁻¹

z ₁
0.0351
0.0701
0.1570
0.1915
0.2602
0.3114
0.3453
0.3961
0.4297
0.4633
0.5134
0.5466
0.5963
0.6293
0.7111
0.7437
0.7923
0.8246
0.8727
0.9047

T / K = 323.15

P / bar = 50.00

h^M / J.mol⁻¹

z ₁
0.0344
0.0687
0.1030
0.1542
0.1883
0.2223
0.2562
0.3069
0.3407
0.3911
0.4247
0.4581
0.5082
0.5415
0.5913
0.6244
0.6574
0.6904
0.7069
0.7233
0.7397
0.7561
0.7725
0.7889
0.8052
0.8215
0.8378
0.8541
0.9029
0.9515
0.9839

Ott, J.B. - Brown, P.R. - Moore, J.D. - Lewellen, A.C., Excess molar enthalpies and excess molar volumes for (propane + ethane) over the temperature range from 273.15 K to 373.15 K and the pressure range from 5 MPa to 15 MPa, The Journal of Chemical Thermodynamics. 29 (1997) 149-178. doi:10.1006/jcht.1996.0144

T / K = 363.15

P / bar =	50.00	2870.0	0.3407
$h^M / \text{J.mol}^{-1}$	z_1	2733.0	0.3911
-29.00	0.0171	2654.0	0.4247
-52.00	0.0343	2546.0	0.4581
-72.00	0.0514	2273.0	0.5082
-78.00	0.0685	2222.0	0.5415
-74.00	0.1026	1963.0	0.5913
-52.00	0.1197	1868.0	0.6244
80.00	0.1537	1649.0	0.6574
153.00	0.1707	1452.0	0.7069
442.00	0.1877	1269.0	0.7397
954.00	0.2046	1067.0	0.7889
1435.0	0.2216	802.00	0.8215
2461.0	0.2723	616.00	0.8704
2965.0	0.3061	394.00	0.9029
3276.0	0.3566	214.00	0.9515
3305.0	0.3901	33.00	0.9839
3272.0	0.4237		
3157.0	0.4738		
3032.0	0.5072		
2904.0	0.5405		
2677.0	0.5903		
2502.0	0.6234		
2225.0	0.6730		
2035.0	0.7060		
1702.0	0.7553		
1502.0	0.7882		
1280.0	0.8209		
1016.0	0.8700		
756.00	0.9026		
87.00	0.9838		

Critical point

Miksovsky, J. - Wichterle, I., Liquid-vapor equilibrium. LXX. Vapor-liquid equilibria in the ethane-propane system at high pressures, Collect. Czech. Chem. Commun. 40 (1975) 365-370. doi:10.1135/cccc19750365

T / K	P / bar	x_1
305.40	48.81	0.9986
305.93	49.11	0.9920
306.50	49.38	0.9839
307.55	49.71	0.9697
343.17	49.96	0.4783

Uchtyl, Petr - Wichterle, Ivan, Liquid-vapour critical region of the most volatile component of a ternary system. I. Vapour-liquid equilibria in the ethane - propane - n-butane system, Fluid Phase Equilibria. 15 (1983) 209-217. doi:10.1016/0378-3812(83)80153-8

T / K	P / bar	x_1
305.81	48.82	0.9946
305.97	48.88	0.9932
306.19	48.95	0.9911
306.29	48.96	0.9897
306.54	49.01	0.9864
306.88	49.06	0.9818
307.20	49.13	0.9784
307.60	49.21	0.9734

Van Poolen, Lambert J. - Holcomb, Cynthia D., Critical temperatures, pressures, and densities for the mixtures CO₂-C₃H₈, CO₂-nC₄H₁₀, C₂H₆-C₃H₈, and C₃H₈-nC₄H₁₀, Fluid Phase Equilibria. 165 (1999) 157-168. doi:10.1016/S0378-3812(99)00275-7

Ott, J.B. - Brown, P.R. - Moore, J.D. - Lewellen, A.C., Excess molar enthalpies and excess molar volumes for (propane + ethane) over the temperature range from 273.15 K to 373.15 K and the pressure range from 5 MPa to 15 MPa, The Journal of Chemical Thermodynamics. 29 (1997) 149-178. doi:10.1006/jcht.1996.0144

T / K = **373.15**

P / bar = **50.00**

$h^M / \text{J.mol}^{-1}$	z_1
287.00	0.0344
1072.0	0.0687
1326.0	0.0859
2117.0	0.1201
2390.0	0.1542
2683.0	0.1883
2829.0	0.2223
2938.0	0.2562
2936.0	0.3069

T / K	P / bar	x_1
310.18	48.99	0.9400
329.46	50.92	0.7050
339.24	50.61	0.5686
344.72	50.16	0.5031
354.37	48.35	0.3331

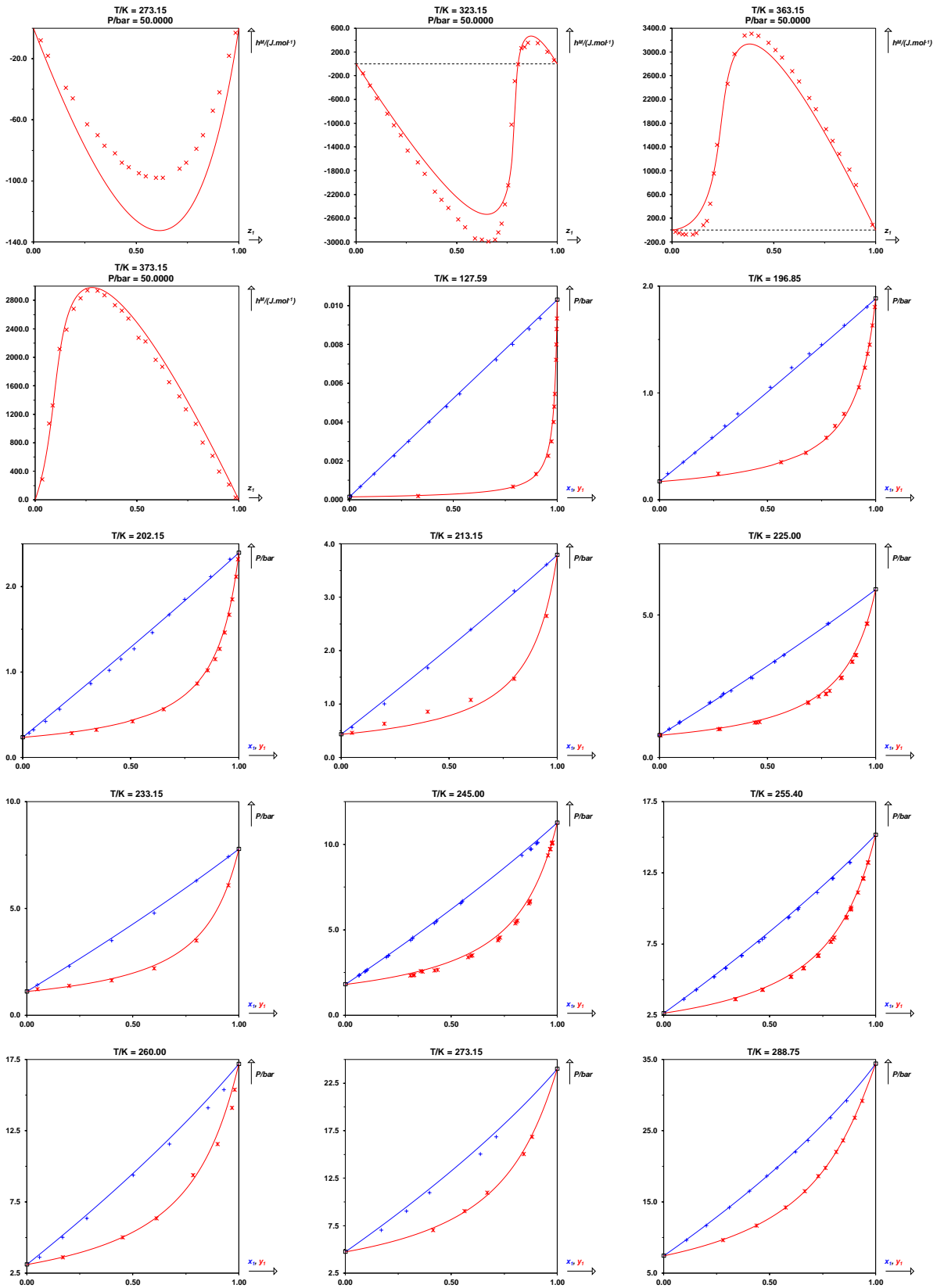
Horstmann, Sven - Fischer, Kai - Gmehling, Jürgen, Experimental determination of critical data of mixtures and their relevance for the development of thermodynamic models, Chemical Engineering Science. 56 (2001) 6905-6913. doi:10.1016/S0009-2509(01)00332-3

T / K	P / bar	x_1
314.10	50.17	0.8997
321.38	50.65	0.8205
327.48	50.76	0.7389
333.05	50.61	0.6603
337.91	50.30	0.5807
344.06	49.60	0.4803
352.45	47.98	0.3598
358.00	46.47	0.2398
363.96	44.47	0.1202

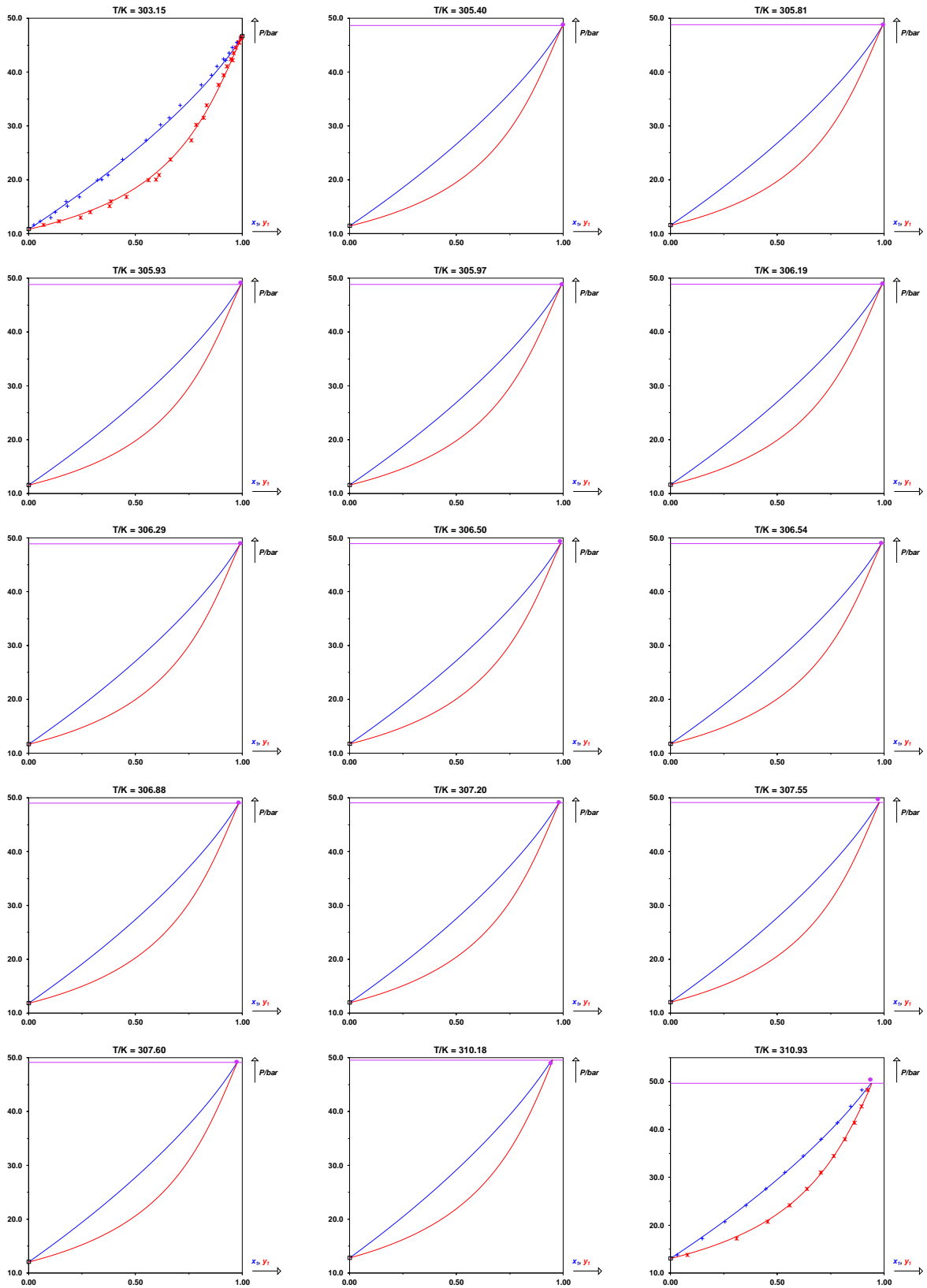
Matschke, D. E. - Thodos, G., Vapor-liquid equilibria for the ethane-propane system, J. Chem. Eng. Data. 7 (1962) 232-234. doi:10.1021/jc60013a022

T / K	P / bar	x_1
314.22	51.09	0.9000
330.89	51.92	0.7000
338.17	51.57	0.6000
344.89	50.81	0.5000
351.11	49.71	0.4000
356.78	48.33	0.3000
361.94	46.75	0.2000
366.39	44.89	0.1000

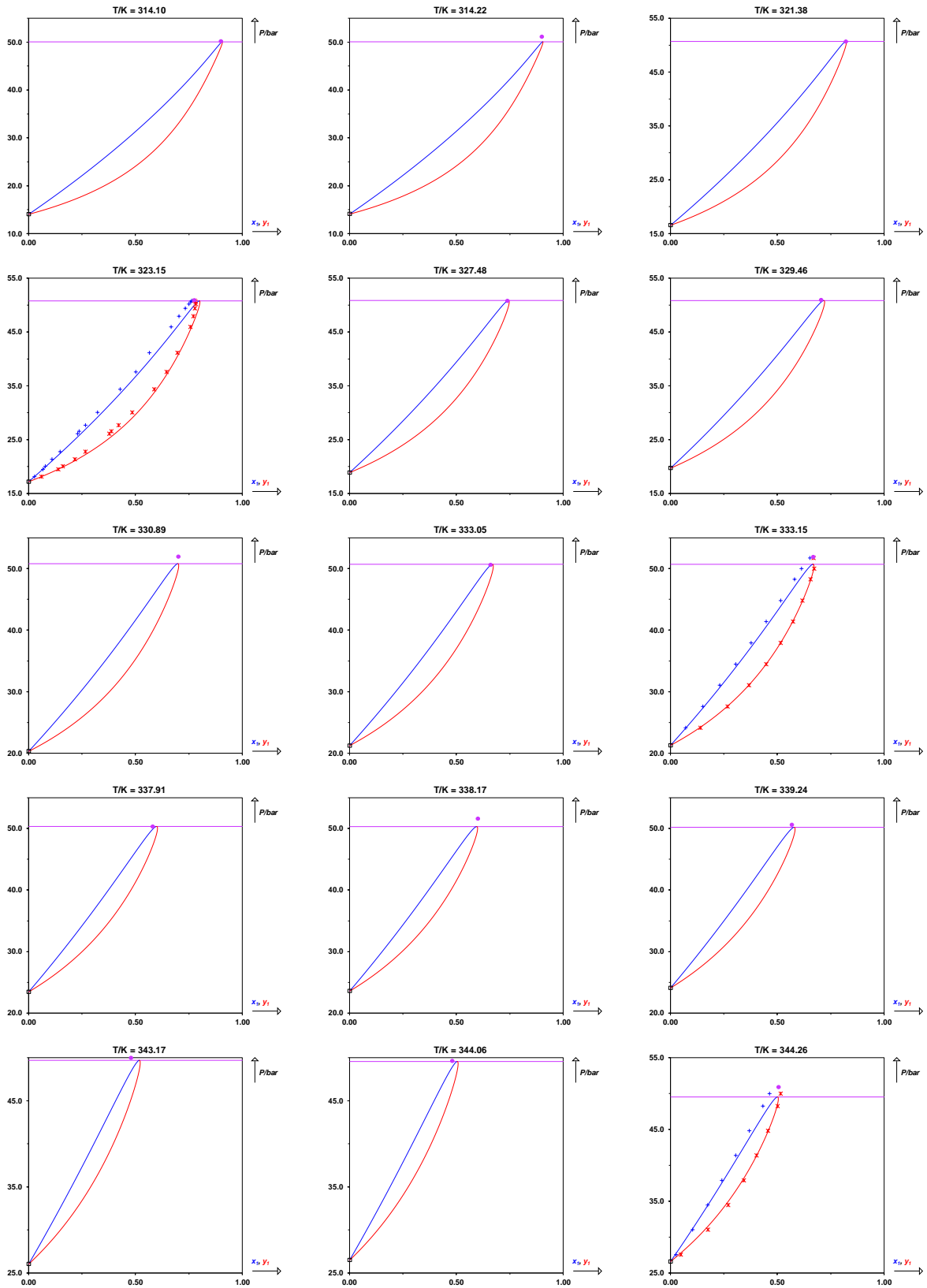
NA-NA systems (BAC = 1)



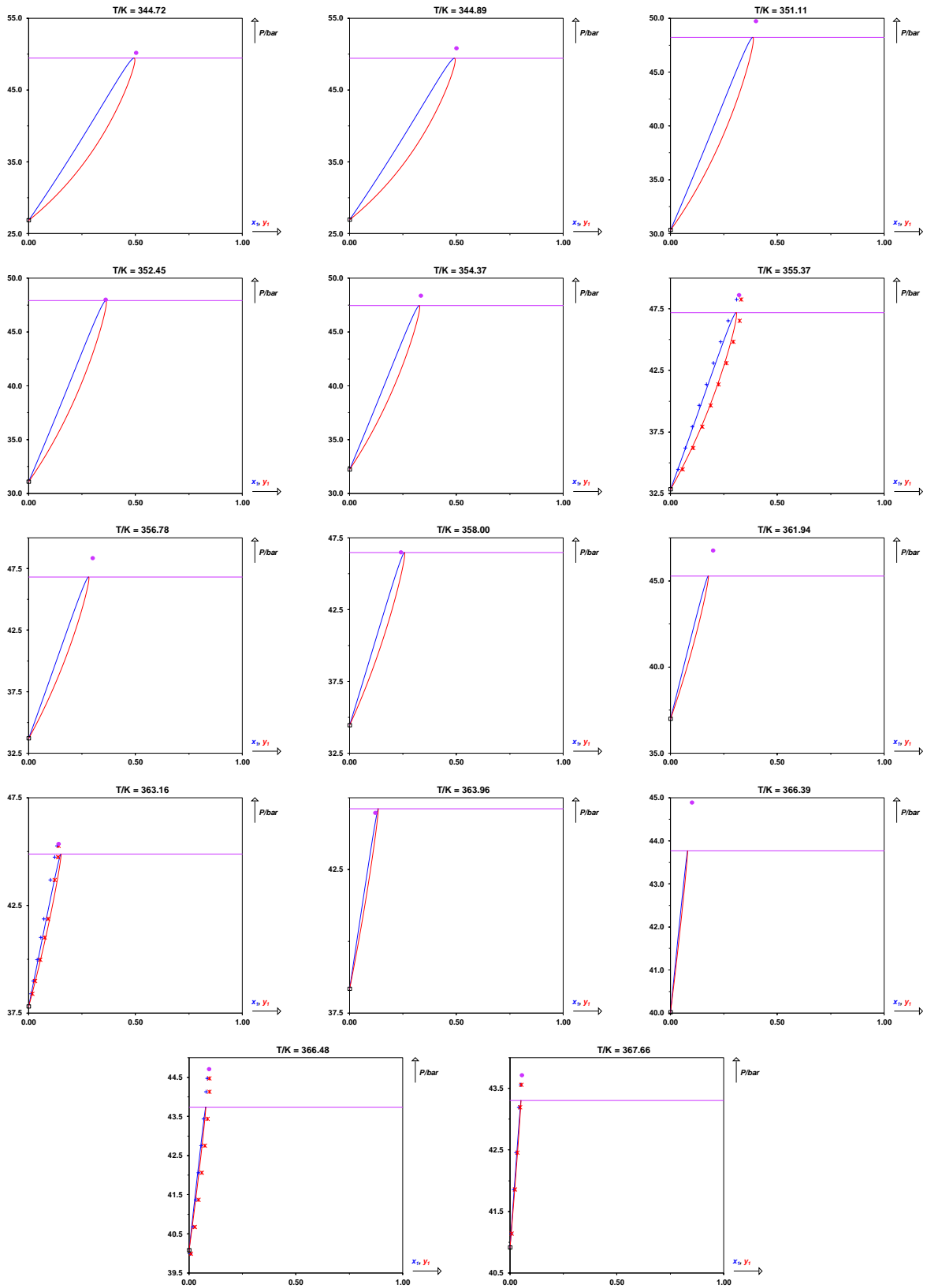
NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



ETHANE (1) + n-HEPTANE (2)

CAS	74-84-0	142-82-5
InChiKey	OTMSDBZUPAUEDD-UHFFFAOYSA-N	IMNFDUFMRHMDMM-UHFFFAOYSA-N
T_c / K	305.32	540.20
P_c / bar	48.72	27.40
ω	0.099	0.349

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 10.17$

$B/\text{MPa} = 417.7$

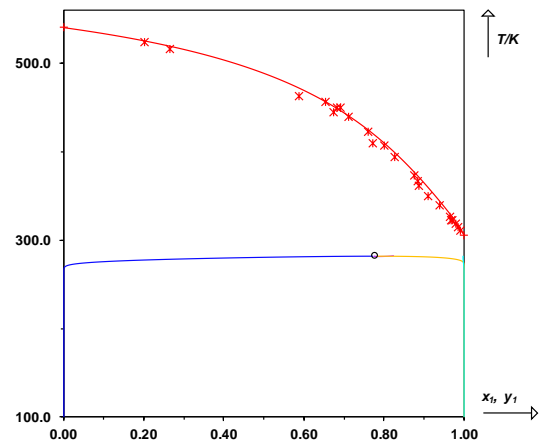
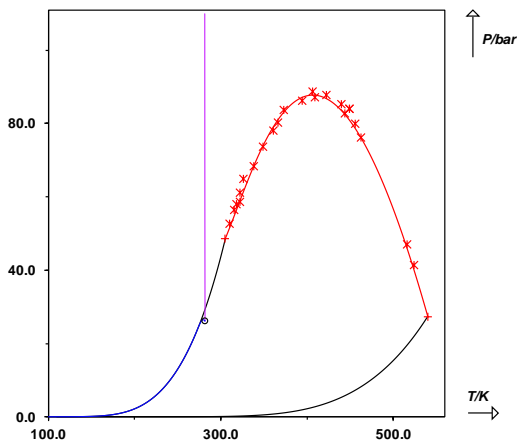
Deviations

MAPE on $x = 4.7\%$

MAPE on $y = 3.8\%$

MAPE on $x_c = 6.7\%$

MAPE on $P_c = 1.8\%$



-----			418.15	0.3500	
Isobaric phase equilibrium data			397.59	0.4000	
-----			365.37	0.5000	
Kay, W. B., Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System, Industrial & Engineering Chemistry. 30 (1938) 459-465. doi:10.1021/ie50340a023			343.15	0.6000	
P / bar = 27.58			327.59	0.7000	
T / K	x ₁	y ₁	316.48	0.8000	
285.35	0.9000	0.9980	306.76	0.9000	
292.55	0.8000	0.9960	Kay, W. B., Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System, Industrial & Engineering Chemistry. 30 (1938) 459-465. doi:10.1021/ie50340a023		
300.95	0.7000	0.9950	P / bar = 55.16		
312.55	0.6000	0.9930	T / K	x ₁	y ₁
328.45	0.5000	0.9870	323.75	0.9000	0.9827
350.35	0.4000	0.9700	335.95	0.8000	0.9850
384.55	0.3000	0.9190	351.45	0.7000	0.9720
434.25	0.2000	0.7640	371.45	0.6000	0.9520
497.35	0.1000	0.3420	397.05	0.5000	0.9160
Kay, W. B., Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System, Industrial & Engineering Chemistry. 30 (1938) 459-465. doi:10.1021/ie50340a023			433.15	0.4000	0.8290
P / bar = 41.37			474.85	0.3400	0.6540
T / K	y ₁	CRIT	Kay, W. B., Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System, Industrial & Engineering Chemistry. 30 (1938) 459-465. doi:10.1021/ie50340a023		
524.26	0.2000	CRIT	P / bar = 68.95		
523.15	0.2380		T / K	x ₁	y ₁
522.04	0.2530		342.55	0.9000	0.9461
519.26	0.2800		347.55	0.8500	0.9598
517.04	0.3000		355.35	0.8000	0.9580
505.37	0.4000		376.45	0.7000	0.9382
492.04	0.5000		401.45	0.6000	0.9017
477.59	0.6000		441.45	0.5000	0.8000
460.93	0.7000		479.25	0.5000	0.5740
437.59	0.8000		480.35	0.5100	0.5550
402.04	0.9000		Kay, W. B., Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System, Industrial & Engineering Chemistry. 30 (1938) 459-465. doi:10.1021/ie50340a023		
373.15	0.9500		P / bar = 82.74		
355.93	0.9700		T / K	x ₁	y ₁
344.26	0.9800		444.25	0.6750	0.6750
328.15	0.9900		442.05	0.6400	0.7130
Kay, W. B., Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System, Industrial & Engineering Chemistry. 30 (1938) 459-465. doi:10.1021/ie50340a023			425.95	0.6500	0.8000
P / bar = 41.37			407.55	0.7000	0.8540
T / K	x ₁		392.55	0.7500	0.8830
523.70	0.1850		380.95	0.8000	0.8930
522.04	0.1790		374.85	0.8500	0.8775
519.26	0.1770				
505.37	0.1930				
500.37	0.2000				
469.26	0.2500				
442.59	0.3000				

Critical point

Singh, Harcharan - Lucien, Frank P. - Foster, Neil R., Critical Properties for Binary Mixtures of Ethane Containing Low Concentrations of n-Alkane, Journal of Chemical & Engineering Data. 45 (2000) 131-135.

doi:10.1021/je990220w

T / K	P / bar	x ₁
310.40	52.80	0.9913
315.00	56.40	0.9849
318.00	57.90	0.9798
322.40	61.30	0.9713
325.80	64.80	0.9650

Kay, W. B., Liquid-Vapor Phase Equilibrium Relations in the Ethane-n-Heptane System, Industrial & Engineering Chemistry. 30 (1938) 459-465. doi:10.1021/ie50340a023

T / K	P / bar	x ₁
322.21	58.61	0.9685
360.82	78.05	0.8871
409.15	87.08	0.7709
463.09	76.26	0.5871
515.48	47.02	0.2654

Mehra, V. S. - Thodos, George, Vapor-Liquid Equilibrium in the Ethane-n-Heptane System., Journal of Chemical & Engineering Data. 10 (1965) 211-214.

doi:10.1021/je60026a001

T / K	P / bar	x ₁
338.71	68.33	0.9390
366.48	80.32	0.8830
394.26	86.19	0.8250

Ekiner, Okan - Thodos, George, Critical temperatures and pressures of the ethane-n-heptane system, The Canadian Journal of Chemical Engineering. 43 (1965) 205-208.

doi:10.1002/cjce.5450430411

T / K	P / bar	x ₁
348.98	73.84	0.9112
372.87	83.77	0.8760
406.48	88.74	0.8014
439.54	85.36	0.7104
455.93	80.12	0.6550

Cota, H. M. - Thodos, George, Critical Temperatures and Critical Pressures of Hydrocarbon Mixtures. Methane Ethane-n-Butane System., Journal of Chemical & Engineering Data. 7 (1962) 62-65.

doi:10.1021/je60012a018

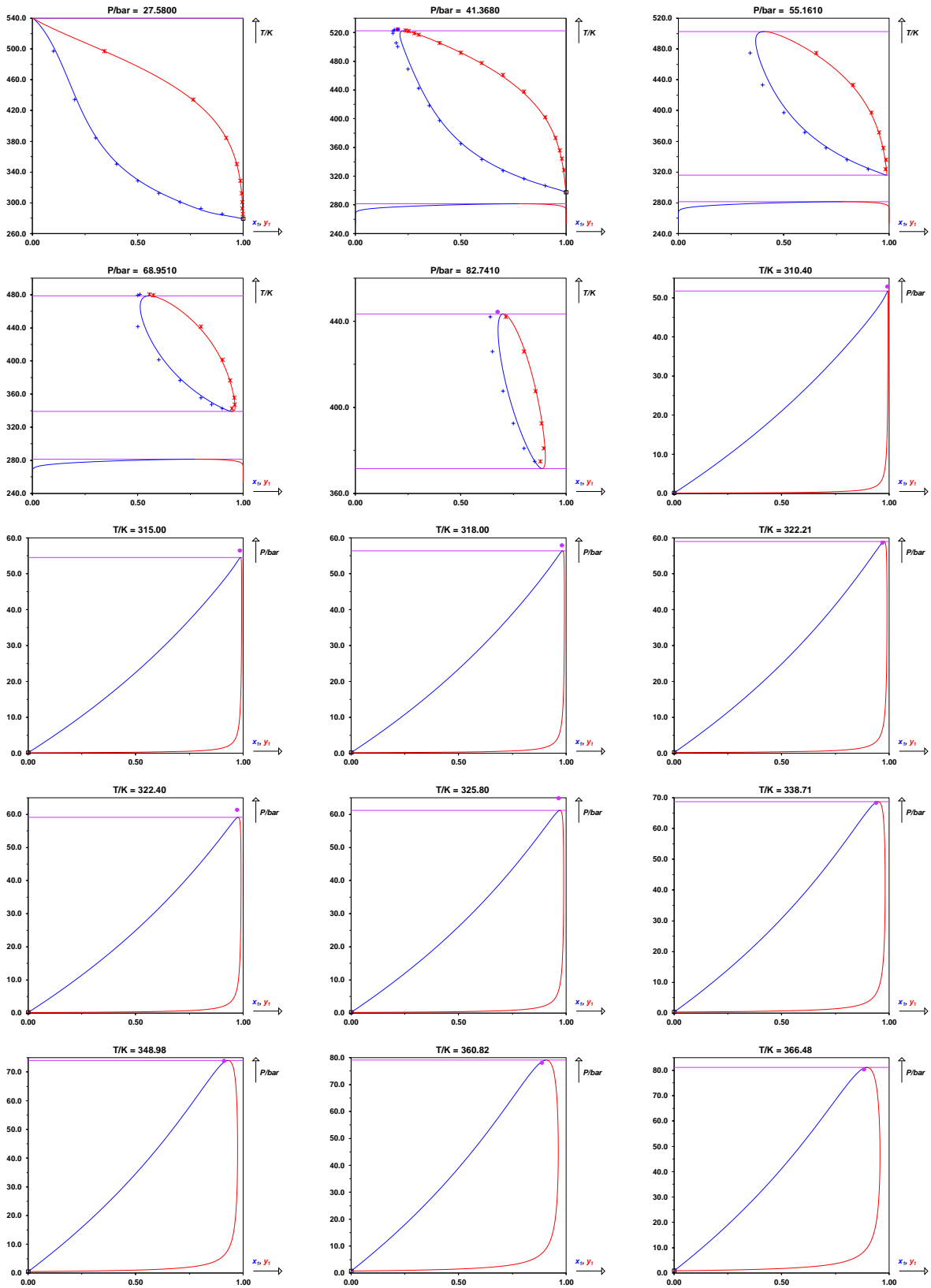
T / K	P / bar	x ₁
422.04	87.91	0.7600
449.82	84.05	0.6900

Mehra, Vinod S. - Thodos, George., Vapor-liquid equilibrium constants for the ethane-butane-n-heptane system at 300° and 350°F, Journal of Chemical & Engineering Data. 13 (1968) 155-160.

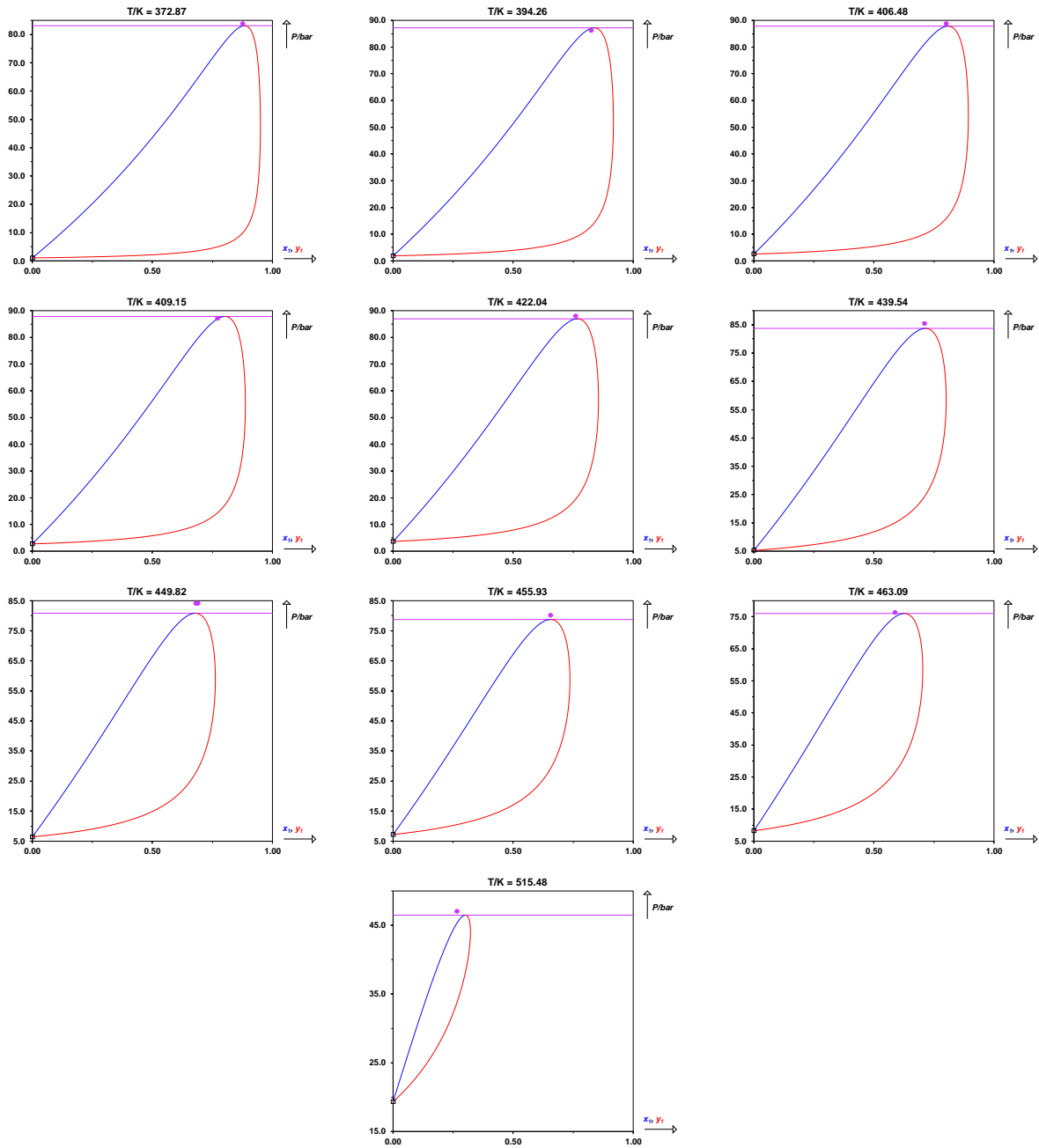
doi:10.1021/je60037a004

T / K	P / bar	x ₁
449.82	84.05	0.6810

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



ETHANE (1) + n-HEXATRIACONTANE (2)

CAS	74-84-0	630-06-8
InChiKey	OTMSDBZUPAUEDD-UHFFFAOYSA-N	YDLYQMBWCWFRAI-UHFFFAOYSA-N
T_c / K	305.32	874.00
P_c / bar	48.72	6.80
ω	0.099	1.526

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

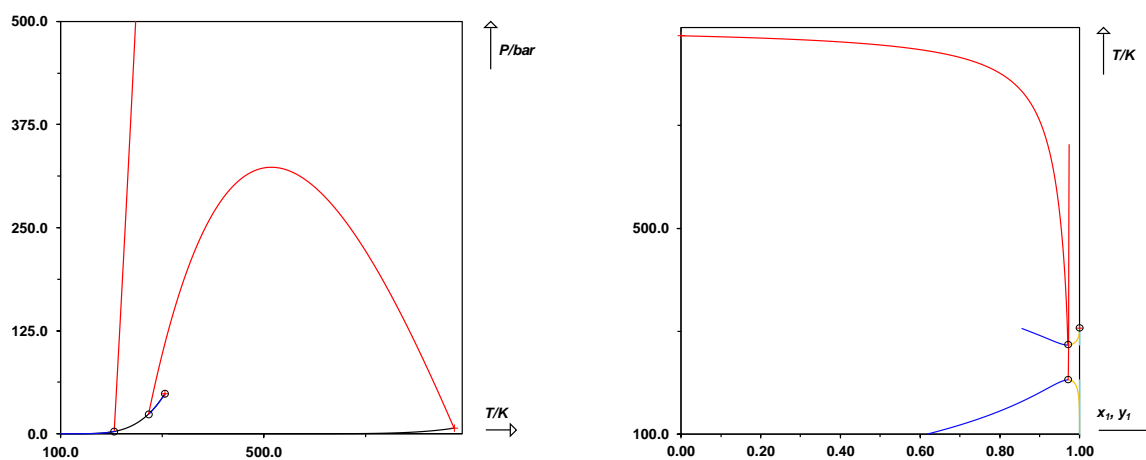
$A/\text{MPa} = 38.59$

$B/\text{MPa} = 32.08$

Deviations

MAPE on $x = 31\%$

MAPE on $y = 22\%$



-----		206.50	0.9760
Isothermal phase equilibrium data		211.70	0.9799
-----		212.10	0.9817
Schwarz, C.E. - Nieuwoudt, I. - Knoetze, J.H., Phase equilibria of long chain n-alkanes in supercritical ethane: Review, measurements and prediction, The Journal of Supercritical Fluids. 46 (2008) 226-232. doi:10.1016/j.supflu.2008.05.007		Schwarz, C.E. - Nieuwoudt, I. - Knoetze, J.H., Phase equilibria of long chain n-alkanes in supercritical ethane: Review, measurements and prediction, The Journal of Supercritical Fluids. 46 (2008) 226-232. doi:10.1016/j.supflu.2008.05.007	
T / K = 350.00		T / K = 358.00	
P / bar	x_1	P / bar	y_1
134.00	0.9086	207.10	0.9835
160.30	0.9260	200.80	0.9883
166.00	0.9389	195.10	0.9915
179.50	0.9485	184.20	0.9947
190.20	0.9588	176.50	0.9976
192.00	0.9666	171.10	0.9984
193.50	0.9724	164.00	0.9990
194.10	0.9620		
194.60	0.9760		
199.70	0.9799		
200.00	0.9817		
Schwarz, C.E. - Nieuwoudt, I. - Knoetze, J.H., Phase equilibria of long chain n-alkanes in supercritical ethane: Review, measurements and prediction, The Journal of Supercritical Fluids. 46 (2008) 226-232. doi:10.1016/j.supflu.2008.05.007		Schwarz, C.E. - Nieuwoudt, I. - Knoetze, J.H., Phase equilibria of long chain n-alkanes in supercritical ethane: Review, measurements and prediction, The Journal of Supercritical Fluids. 46 (2008) 226-232. doi:10.1016/j.supflu.2008.05.007	
T / K = 350.00		T / K = 366.00	
P / bar	y_1	P / bar	x_1
195.20	0.9835	160.10	0.9086
189.10	0.9883	184.30	0.9260
183.40	0.9915	192.30	0.9389
172.10	0.9947	204.10	0.9485
165.60	0.9976	214.50	0.9588
159.40	0.9984	216.20	0.9666
153.30	0.9990	217.40	0.9724
		217.70	0.9620
		218.50	0.9760
		223.80	0.9799
		224.30	0.9817
Schwarz, C.E. - Nieuwoudt, I. - Knoetze, J.H., Phase equilibria of long chain n-alkanes in supercritical ethane: Review, measurements and prediction, The Journal of Supercritical Fluids. 46 (2008) 226-232. doi:10.1016/j.supflu.2008.05.007		Schwarz, C.E. - Nieuwoudt, I. - Knoetze, J.H., Phase equilibria of long chain n-alkanes in supercritical ethane: Review, measurements and prediction, The Journal of Supercritical Fluids. 46 (2008) 226-232. doi:10.1016/j.supflu.2008.05.007	
T / K = 358.00		T / K = 366.00	
P / bar	x_1	P / bar	y_1
147.00	0.9086	219.00	0.9835
172.30	0.9260	212.40	0.9883
179.10	0.9389	206.80	0.9915
191.80	0.9485	196.40	0.9947
202.30	0.9588	187.30	0.9976
204.10	0.9666	182.80	0.9984
205.40	0.9724	174.70	0.9990
205.90	0.9620		

Tsai, Fuan Nan - Huang, Stanley H. - Lin, Ho Mu - Chao, Kwang Chu, Solubility of methane, ethane, and carbon dioxide in n-hexatriacontane, Journal of Chemical & Engineering Data. 32 (1987) 467-469. doi:10.1021/je00050a025

T / K = 373.20

P / bar	x_1
10.20	0.2120
20.28	0.3620
30.40	0.4660
40.33	0.5320

Gasem, Khaled A. M. - Bufkin, Brian A. - Raff, Aaron M. - Robinson, Robert L., Solubilities of ethane in heavy normal paraffins at pressures to 7.8 MPa and temperatures from 348 to 423 K, Journal of Chemical & Engineering Data. 34 (1989) 187-191. doi:10.1021/je00056a012

T / K = 373.20

P / bar	x_1
3.680	0.0870
7.520	0.1660
12.38	0.2510
16.27	0.3070
19.78	0.3540
26.05	0.4270

Gasem, Khaled A. M. - Bufkin, Brian A. - Raff, Aaron M. - Robinson, Robert L., Solubilities of ethane in heavy normal paraffins at pressures to 7.8 MPa and temperatures from 348 to 423 K, Journal of Chemical & Engineering Data. 34 (1989) 187-191. doi:10.1021/je00056a012

T / K = 423.20

P / bar	x_1
9.650	0.1530
13.57	0.2070
23.15	0.3150
33.93	0.4080
42.56	0.4680
47.60	0.5000

Tsai, Fuan Nan - Huang, Stanley H. - Lin, Ho Mu - Chao, Kwang Chu, Solubility of methane, ethane, and carbon dioxide in n-hexatriacontane, Journal of Chemical & Engineering Data. 32 (1987) 467-469. doi:10.1021/je00050a025

T / K = 473.05

P / bar	x_1
10.14	0.1260
20.31	0.2340
30.38	0.3210

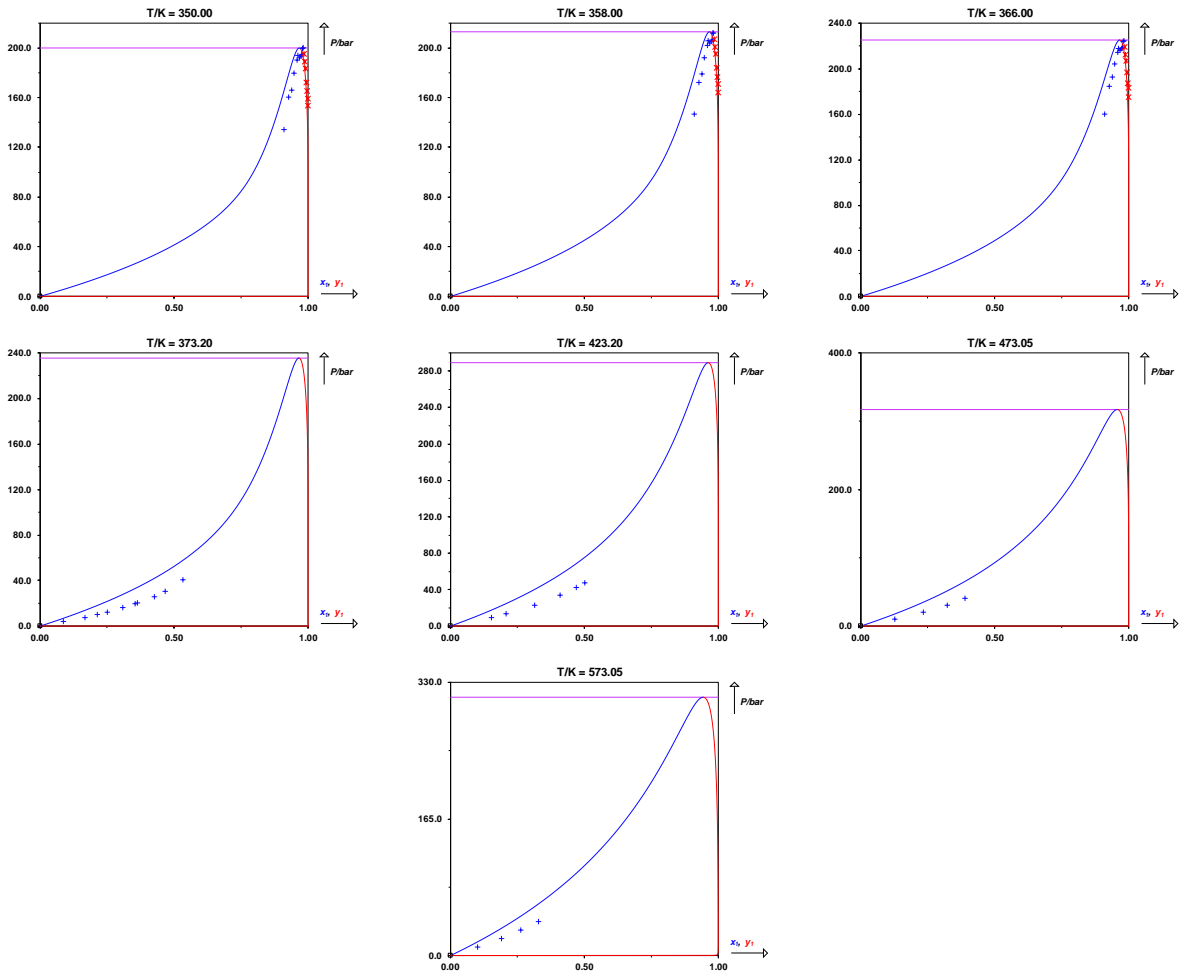
40.49 0.3900

Tsai, Fuan Nan - Huang, Stanley H. - Lin, Ho Mu - Chao, Kwang Chu, Solubility of methane, ethane, and carbon dioxide in n-hexatriacontane, Journal of Chemical & Engineering Data. 32 (1987) 467-469. doi:10.1021/je00050a025

T / K = 573.05

P / bar	x_1
10.19	0.1010
20.34	0.1900
30.40	0.2630
40.52	0.3270

NA-NA systems (BAC = 1)



ARGON (1) + METHANE (2)

CAS	7440-37-1	74-82-8
InChiKey	XKRFYHLGVUSROY-UHFFFAOYSA-N	VNWK TOKETHGBQD-UHFFFAOYSA-N
T_c / K	150.86	190.56
P_c / bar	48.98	45.99
ω	0.000	0.012

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 19.79$

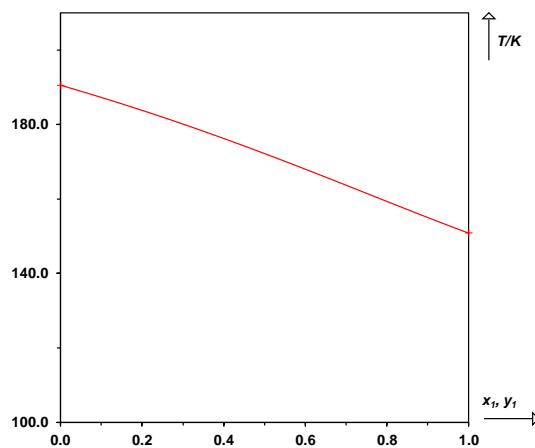
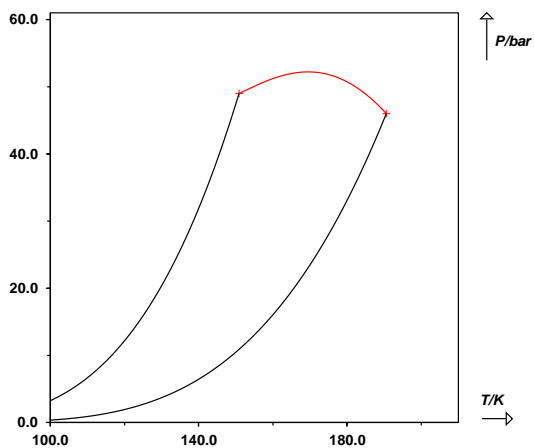
$B/\text{MPa} = 27.43$

Deviations

MAPE on $x = 5.0\%$

MAPE on $y = 5.7\%$

MAPE on $h^M = 22\%$



Isothermal phase equilibrium data

Sprow, F. B. - Prausnitz, J. M., Vapor-Liquid equilibria for five cryogenic mixtures, AIChE Journal. 12 (1966) 780-784. doi:10.1002/aic.690120427

T / K = 90.67		
P / bar	x ₁	y ₁
0.2671	0.0832	0.5950
0.3238	0.1170	0.6770
0.4606	0.2040	0.7920
0.5829	0.2890	0.8480
0.7426	0.4110	0.8980
0.8597	0.5080	0.9240
1.092	0.7120	0.9610
1.252	0.8520	0.9800
1.324	0.9130	0.9880

Calado, J. C. G. - Staveley, L. A. K., Excess Gibbs Energy of Argon-Methane Liquid Mixtures at 115.77°K, The Journal of Chemical Physics. 56 (1972) 4718-4719. doi:10.1063/1.1677927

T / K = 115.77		
P / bar	x ₁	y ₁
3.124	0.1812	0.6069
3.909	0.2790	0.7116
4.964	0.4098	0.8022
5.385	0.4632	0.8294
5.738	0.5139	0.8511
6.857	0.6603	0.9048
7.555	0.7538	0.9333
7.762	0.8049	0.9477

Shatskaya, L.V. - Zhirnova, N.A., Liquid-vapor phase equilibria in two-component systems at low temperatures. I. Argon-methane system, Russ. J. Phys. Chem. 50 (1976) 298-298.

T / K = 123.05		
P / bar	x ₁	y ₁
3.040	0.0487	0.2340
4.053	0.1240	0.4530
5.066	0.2005	0.6010
6.080	0.2800	0.6985
7.093	0.3627	0.7610
8.106	0.4480	0.8083
9.119	0.5408	0.8483
10.13	0.6430	0.8838
11.15	0.7427	0.9150
12.16	0.8330	0.9450
13.17	0.9186	0.9736

Kehlen, H. - Schneider, F.-U. - Haufe, S. - Barnitzke, W., Auswertung von Taudruckmessungen binärer Systeme im Mitteldruckbereich, Zeitschrift für Physikalische Chemie. 2640 (1983) doi:10.1515/zpch-1983-26497

T / K = 130.60		
P / bar	x ₁	y ₁
8.100	0.2660	0.5770
9.500	0.3270	0.6860
11.10	0.4240	0.7590
14.50	0.6410	0.8600
15.90	0.7350	0.9090

Christiansen, L.J. - Fredenslund, Aa., Vapour-liquid equilibria of the CH₄-Ar-CO system, Cryogenics. 14 (1974) 10-14. doi:10.1016/0011-2275(74)90037-X

T / K = 164.00		
P / bar	x ₁	y ₁
20.27	0.0380	0.1000
35.43	0.3690	0.5390

Christiansen, L.J. - Fredenslund, Aa. - Mollerup, J., Vapour-liquid equilibrium of the CH₄-Ar, CH₄-CO, and Ar-CO systems at elevated pressures, Cryogenics. 13 (1973) 405-413. doi:10.1016/0011-2275(73)90076-3

T / K = 164.00		
P / bar	x ₁	y ₁
20.43	0.0410	0.1130
22.88	0.0980	0.2220
26.18	0.1750	0.3330
27.36	0.1960	0.3620
30.69	0.2680	0.4450
35.14	0.3680	0.5350
35.64	0.3740	0.5420
38.97	0.4410	0.5900
42.09	0.5050	0.6310
45.05	0.5620	0.6680
48.76	0.6300	0.7000
50.99	0.6650	0.6960

Christiansen, L.J. - Fredenslund, Aa. - Mollerup, J., Vapour-liquid equilibrium of the CH₄-Ar, CH₄-CO, and Ar-CO systems at elevated pressures, Cryogenics. 13 (1973) 405-413. doi:10.1016/0011-2275(73)90076-3

T / K = 178.00		
P / bar	x ₁	y ₁
32.10	0.0240	0.0530
33.09	0.0460	0.0900
36.48	0.1090	0.1850
39.85	0.1650	0.2530
42.29	0.2040	0.2920
43.66	0.2270	0.3140
46.29	0.2680	0.3550

49.76 0.3220 0.3870
49.95 0.3330 0.3760

Enthalpy of mixing

Lewis, K.L. - Saville, G. - Staveley, L.A.K., Excess enthalpies of liquid oxygen + argon, oxygen + nitrogen, and argon + methane, The Journal of Chemical Thermodynamics. 7 (1975) 389-400. doi:10.1016/0021-9614(75)90178-0

T / K = 91.50

P / bar = UNKNOWN (3.0966)

$h^M / \text{J.mol}^{-1}$ x_1
77.30 0.2800
93.80 0.4030
101.40 0.4880
101.90 0.5150
85.30 0.7260
69.50 0.8070

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 123.00

P / bar = 60.80

$h^M / \text{J.mol}^{-1}$ z_1
41.00 0.1560
54.00 0.1860
72.00 0.3540
89.00 0.4300
91.00 0.5060
84.00 0.6150
63.00 0.7930

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 123.00

P / bar = 10.10

$h^M / \text{J.mol}^{-1}$ z_1
-848.00 0.1600
-1561.0 0.2120
-1302.0 0.7120
401.00 0.8600

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical

Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 130.00

P / bar = 40.50

$h^M / \text{J.mol}^{-1}$ z_1
28.00 0.1340
49.00 0.2420
48.00 0.2700
63.00 0.4490
68.00 0.5550
45.00 0.7650

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 130.00

P / bar = 80.90

$h^M / \text{J.mol}^{-1}$ z_1
40.00 0.1500
64.00 0.2820
84.00 0.5080
85.00 0.5950
23.00 0.9340

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 140.00

P / bar = 40.60

$h^M / \text{J.mol}^{-1}$ z_1
16.00 0.2670
15.00 0.3780
9.000 0.5250
-2.000 0.7070
-7.000 0.7970
-6.000 0.8990

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 140.00

P / bar = 61.00

$h^M / \text{J.mol}^{-1}$ z_1
23.00 0.1460
33.00 0.3370
40.00 0.4680

34.00 0.6070
 28.00 0.7740
 14.00 0.8350

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 140.00

P / bar = 10.20

$h^M / \text{J.mol}^{-1}$ z_1
 -130.00 0.0520
 741.00 0.2260
 888.00 0.2350
 1909.0 0.2920
 3376.0 0.4120
 3106.0 0.4970
 2631.0 0.6160
 1380.0 0.8150

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 140.00

P / bar = 20.60

$h^M / \text{J.mol}^{-1}$ z_1
 -439.00 0.1040
 -696.00 0.1550
 -794.00 0.1670
 -1605.0 0.6280
 -601.00 0.7000
 1070.0 0.7970
 753.00 0.8710
 443.00 0.9310

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 140.00

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1
 4.800 0.1230
 10.40 0.5010
 10.00 0.6260
 4.300 0.8580
 3.100 0.8950

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 145.00

P / bar = 47.50

$h^M / \text{J.mol}^{-1}$ z_1
 -10.00 0.1880
 -16.00 0.3020
 -22.00 0.4220
 -35.00 0.5730
 -42.00 0.6950
 -51.00 0.8100
 -48.00 0.8990
 -27.00 0.9490

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 145.00

P / bar = 61.00

$h^M / \text{J.mol}^{-1}$ z_1
 12.00 0.1930
 15.00 0.3250
 7.000 0.5180
 -10.00 0.6780
 -17.00 0.7980
 -13.00 0.8570

Mosedale, S.E. - Wormald, C.J., The enthalpy of mixing of argon + methane at 123, 130, 140, and 145 K, at pressures up to 9.12 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 483-490. doi:10.1016/0021-9614(77)90149-5

T / K = 145.00

P / bar = 81.40

$h^M / \text{J.mol}^{-1}$ z_1
 28.00 0.2720
 37.00 0.3960
 39.00 0.5380
 29.00 0.7130

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 160.00

P / bar = 20.40

$h^M / \text{J.mol}^{-1}$	z_1
-22.00	0.0170
43.00	0.0770
802.00	0.1260
1668.0	0.1630
2956.0	0.1830
4729.0	0.2670
3998.0	0.3150
3290.0	0.4260
2782.0	0.5950
165.00	0.9720

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 160.00

P / bar = 40.70

$h^M / \text{J.mol}^{-1}$	z_1
-488.00	0.1680
-285.00	0.6030
-187.00	0.6340
922.00	0.6870
804.00	0.7750

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 160.00

P / bar = 51.60

$h^M / \text{J.mol}^{-1}$	z_1
-449.00	0.1560
-920.00	0.7170
-232.00	0.7980
117.00	0.8230
141.00	0.8910

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 183.00

P / bar = 35.60

$h^M / \text{J.mol}^{-1}$	z_1
228.00	0.1420
266.00	0.2420
302.00	0.4480
174.00	0.7690

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 183.00

P / bar = 45.70

$h^M / \text{J.mol}^{-1}$	z_1
2214.0	0.2390
2302.0	0.2900
2172.0	0.3810
1903.0	0.4810
1579.0	0.5690
1186.0	0.6920
580.00	0.8540

Lewis, K.L. - Mosedale, S.E. - Wormald, C.J., The enthalpies of mixing of methane + argon, methane + nitrogen, and methane + hydrogen in the gaseous and two-phase regions, The Journal of Chemical Thermodynamics. 9 (1977) 121-131. doi:10.1016/0021-9614(77)90077-5

T / K = 183.00

P / bar = 71.00

$h^M / \text{J.mol}^{-1}$	z_1
-106.00	0.1790
-45.00	0.3330
216.00	0.4560
583.00	0.6660

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K = 201.00

P / bar = 51.00

$h^M / \text{J.mol}^{-1}$	z_1
252.00	0.1200
293.00	0.2410
319.00	0.3780
291.00	0.5340
174.00	0.7630

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K =	201.00
P / bar =	66.00
$h^M / \text{J.mol}^{-1}$	z_1
858.00	0.1910
933.00	0.2410
965.00	0.3200
871.00	0.5530

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K =	201.00
P / bar =	86.20
$h^M / \text{J.mol}^{-1}$	z_1
454.00	0.2680
517.00	0.3790
598.00	0.5160
523.00	0.6490

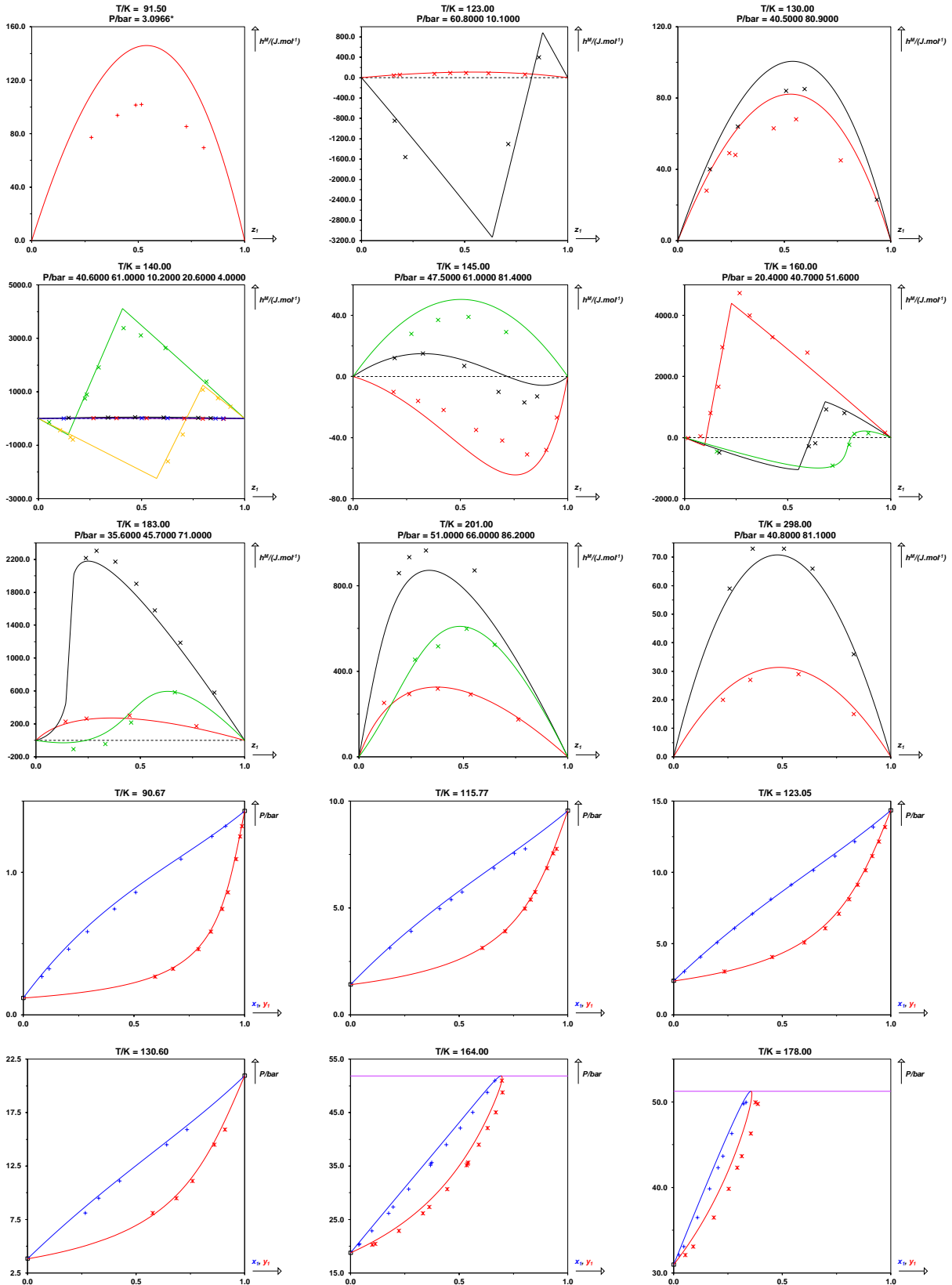
Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K =	298.00
P / bar =	40.80
$h^M / \text{J.mol}^{-1}$	z_1
20.00	0.2270
27.00	0.3530
29.00	0.5750
15.00	0.8290

Wormald, Christopher J. - Lewis, Keith L. - Mosedale, Stephen, The excess enthalpies of hydrogen + methane, hydrogen + nitrogen, methane + nitrogen, methane + argon, and nitrogen + argon at 298 and 201 K at pressures up to 10.2 MPa, The Journal of Chemical Thermodynamics. 9 (1977) 27-42. doi:10.1016/0021-9614(77)90194-X

T / K =	298.00
P / bar =	81.10
$h^M / \text{J.mol}^{-1}$	z_1
59.00	0.2570
73.00	0.3640
73.00	0.5080
66.00	0.6390
36.00	0.8300

NA-NA systems (BAC = 1)



PROPANE (1) + ISOPENTANE (2)

CAS	74-98-6	78-78-4
InChiKey	ATUOYWLBWRKTHZ-UHFFFAOYSA-N	QWTDNUCVQCZILF-UHFFFAOYSA-N
T_c / K	369.83	460.40
P_c / bar	42.48	33.80
ω	0.152	0.228

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 6.348$

$B/\text{MPa} = -1.187$

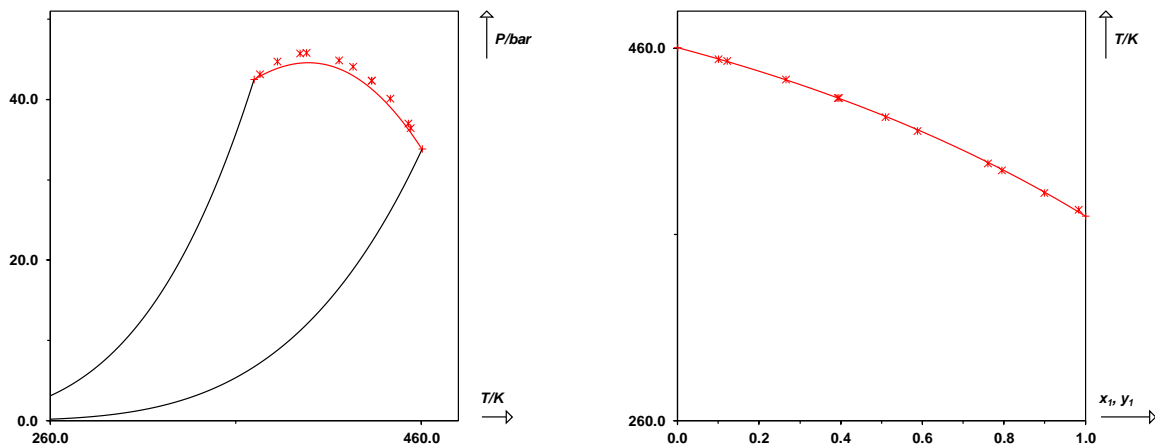
Deviations

MAPE on $x = 3.3\%$

MAPE on $y = 3.2\%$

MAPE on $x_c = 3.0\%$

MAPE on $P_c = 2.1\%$



-----			5.066	0.0460	0.1970	
Isothermal phase equilibrium data			7.093	0.1470	0.4660	
-----			8.612	0.2180	0.5810	
Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027			10.13	0.2900	0.6650	
T / K = 273.15			13.17	0.4230	0.7730	
P / bar	x ₁	y ₁	15.20	0.5090	0.8220	
0.5068	0.0350	0.3510	20.27	0.7110	0.9070	
0.7598	0.0880	0.4980	25.33	0.8940	0.9662	
1.014	0.1580	0.7030	Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027			
1.216	0.2120	0.7640	T / K = 373.15			
1.520	0.2740	0.8210	P / bar	x ₁	y ₁	
2.026	0.3900	0.8840	8.612	0.0490	0.1530	
3.040	0.6210	0.9496	10.13	0.0970	0.2830	
4.053	0.8500	0.9845	13.17	0.1950	0.4960	
Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027			15.20	0.2570	0.5770	
T / K = 298.15			20.27	0.4140	0.7130	
P / bar	x ₁	y ₁	25.33	0.5580	0.7990	
1.520	0.0740	0.4040	30.40	0.6940	0.8630	
2.026	0.1370	0.5810	32.42	0.7450	0.8840	
2.533	0.1980	0.6860	35.46	0.8200	0.9140	
3.040	0.2610	0.7540	37.49	0.8650	0.9330	
4.053	0.3820	0.8430	39.52	0.9095	0.9510	
5.066	0.5010	0.8970	40.53	0.9310	0.9600	
7.093	0.7340	0.9590	41.54	0.9520	0.9695	
Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027			42.56	0.9710	0.9785	
T / K = 323.15			43.11	0.9830	0.9830	CRIT
P / bar	x ₁	y ₁	Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027			
3.040	0.0780	0.3680	T / K = 398.15			
4.053	0.1500	0.5460	P / bar	x ₁	y ₁	
5.066	0.2210	0.6550	15.20	0.0810	0.2110	
7.093	0.3580	0.7820	20.27	0.2050	0.4310	
10.13	0.5620	0.8860	25.33	0.3230	0.5630	
13.17	0.7610	0.9481	30.40	0.4370	0.6520	
15.20	0.8970	0.9787	32.42	0.4790	0.6790	
Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027			35.46	0.5390	0.7150	
T / K = 348.15			37.49	0.5770	0.7350	
P / bar	x ₁	y ₁	39.52	0.6130	0.7530	
3.040	0.0780	0.3680	40.53	0.6310	0.7620	
4.053	0.1500	0.5460	41.54	0.6490	0.7690	
5.066	0.2210	0.6550	42.56	0.6690	0.7760	
7.093	0.3580	0.7820	43.57	0.6910	0.7810	
10.13	0.5620	0.8860	44.58	0.7150	0.7900	
13.17	0.7610	0.9481	45.80	0.7600	0.7600	CRIT
15.20	0.8970	0.9787	Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027			
T / K = 348.15						
P / bar	x ₁	y ₁				
3.040	0.0780	0.3680				
4.053	0.1500	0.5460				
5.066	0.2210	0.6550				
7.093	0.3580	0.7820				
10.13	0.5620	0.8860				
13.17	0.7610	0.9481				
15.20	0.8970	0.9787				

Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027

T / K = 423.15

P / bar	x ₁	y ₁	
20.27	0.0350	0.0810	
25.33	0.1310	0.2550	
30.40	0.2260	0.3760	
32.42	0.2640	0.4150	
35.46	0.3200	0.4670	
37.49	0.3590	0.4940	
39.52	0.3980	0.5170	
40.53	0.4170	0.5250	
41.54	0.4380	0.5300	
42.56	0.4600	0.5310	
43.57	0.4840	0.5250	
44.08	0.5100	0.5100	CRIT

Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027

T / K = 433.15

P / bar	x ₁	y ₁	
25.33	0.0620	0.1230	
30.40	0.1510	0.2570	
32.42	0.1880	0.2990	
35.46	0.2420	0.3530	
37.49	0.2790	0.3820	
39.52	0.3200	0.4030	
40.53	0.3420	0.4090	
41.54	0.3650	0.4110	
42.35	0.3960	0.3960	CRIT

Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027

T / K = 443.15

P / bar	x ₁	y ₁	
30.40	0.0770	0.1320	
32.42	0.1110	0.1770	
35.46	0.1650	0.2350	
37.49	0.2040	0.2610	
39.52	0.2470	0.2750	
40.13	0.2650	0.2650	CRIT

Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial &

Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027

T / K = 453.15

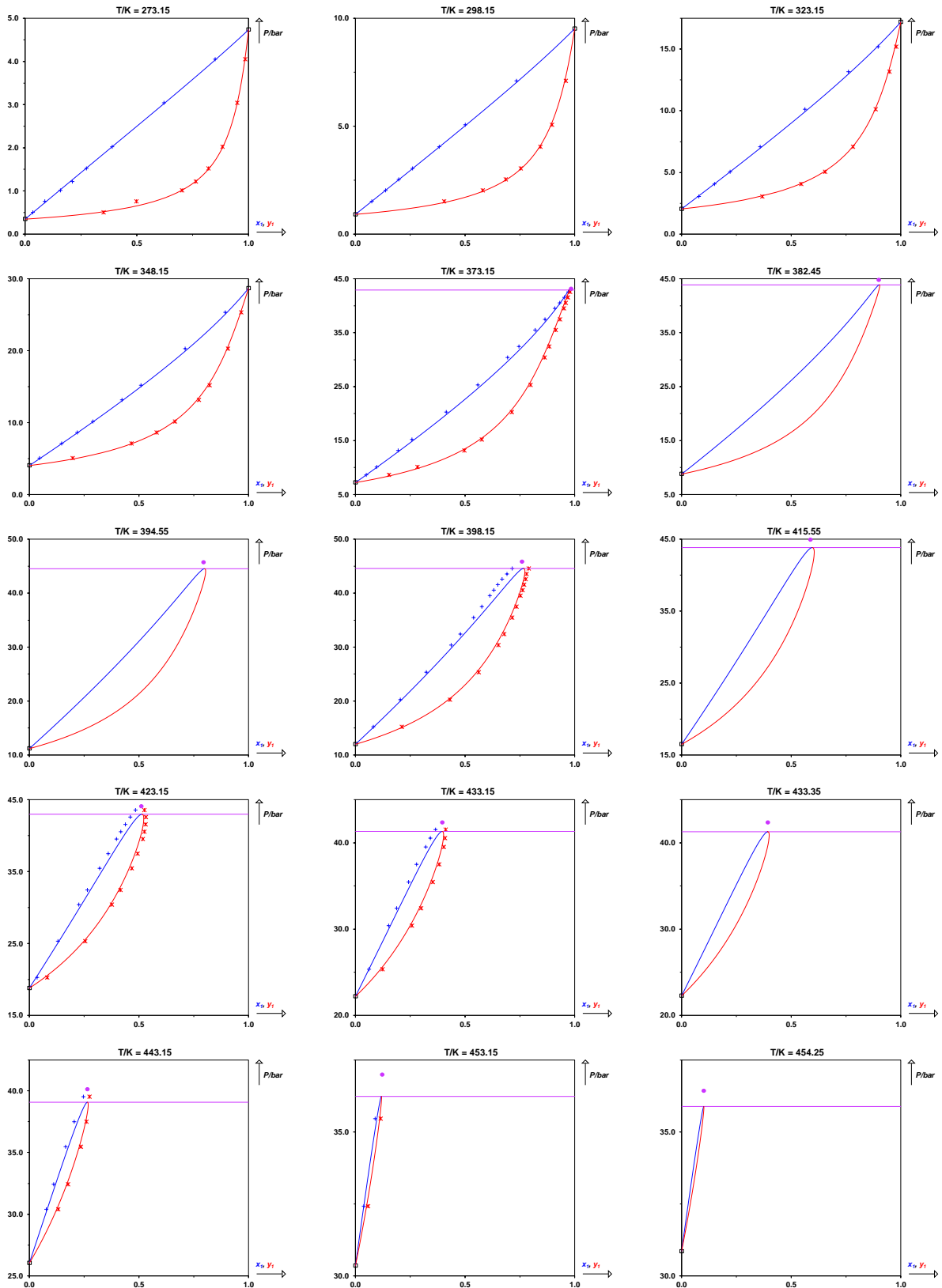
P / bar	x ₁	y ₁	
32.42	0.0380	0.0570	
35.46	0.0900	0.1150	
36.98	0.1220	0.1220	CRIT

Critical point

Vaughan, William E. - Collins, Frank C., P-V-T-x Relations of the System Propane-Isopentane, Industrial & Engineering Chemistry. 34 (1942) 885-890. doi:10.1021/ie50391a027

T / K	P / bar	x ₁
382.45	44.74	0.8990
394.55	45.70	0.7940
415.55	44.89	0.5880
433.35	42.33	0.3930
454.25	36.43	0.1010

NA-NA systems (BAC = 1)



BENZENE (1) + CYCLOHEXANE (2)

CAS	71-43-2	110-82-7
InChiKey	UHOVQNZJYSORNB-UHFFFAOYSA-N	XDTMQSROBMDMFD-UHFFFAOYSA-N
T_c / K	562.05	553.80
P_c / bar	48.95	40.80
ω	0.210	0.208

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 25.13$

$B/\text{MPa} = 57.38$

Deviations

MAPE on $x = 22\%$

MAPE on $y = 21\%$

MAPE on $x_c = 52\%$

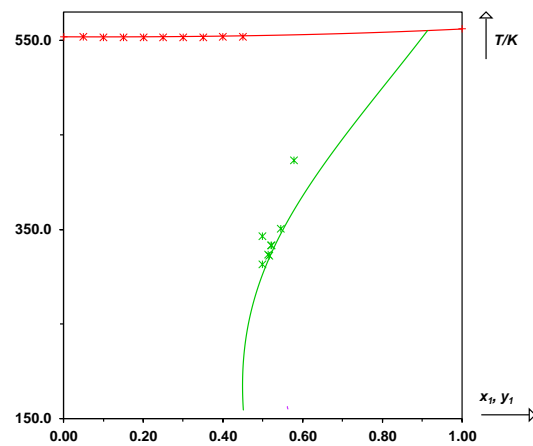
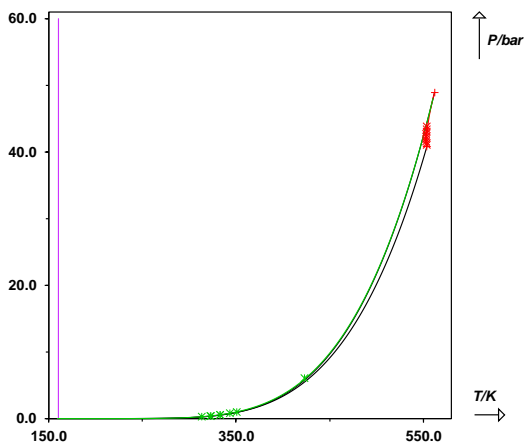
MAPE on $P_c = 3.9\%$

MAPE on $x_{az} = 4.1\%$

MAPE on $P_{az} = 0.92\%$

MAPE on $h^M = 15\%$

MAPE on $c_p^M = 2.7\%$



-----			T / K =	323.15		
Isothermal phase equilibrium data			P / bar	x ₁	y ₁	

Tasić, Aleksandar - Djordjević, Bojan - Grozdanić, Dušan - Afgan, Naim - Malić, Dragomir, Vapour—liquid equilibria of the systems acetone—benzene, benzene—cyclohexane and acetone—cyclohexane at 25°C, Chemical Engineering Science. 33 (1978) 189-197. doi:10.1016/0009-2509(78)85053-2			0.3688	0.0340	0.0480	
			0.3748	0.0740	0.1010	
			0.3794	0.1070	0.1420	
			0.3831	0.1380	0.1770	
			0.3842	0.1470	0.1870	
T / K =	298.15		0.3905	0.2010	0.2450	
P / bar	x ₁	y ₁	0.3936	0.2390	0.2820	
0.1361	0.1035	0.1375	0.3957	0.2740	0.3140	
0.1393	0.1750	0.2170	0.3967	0.2870	0.3260	
0.1423	0.2760	0.3130	0.3999	0.3350	0.3660	
0.1441	0.3770	0.4015	0.4009	0.3650	0.3930	
0.1446	0.4330	0.4460	0.4021	0.4040	0.4260	
0.1449	0.5090	0.5050	0.4031	0.4480	0.4630	
0.1444	0.5830	0.5620	0.4032	0.4770	0.4860	
0.1425	0.6940	0.6505	0.4036	0.5130	0.5130	AZEO
0.1393	0.7945	0.7410	0.4033	0.5310	0.5270	
0.1341	0.9005	0.8565	0.4031	0.5600	0.5500	
0.1309	0.9500	0.9220	0.4027	0.5910	0.5740	
			0.4007	0.6570	0.6260	
Mentzer, R.A. - Greenkorn, R.A. - Chao, K.C., Bubble pressures and vapor-liquid equilibria for four binary hydrocarbon mixtures, The Journal of Chemical Thermodynamics. 14 (1982) 817-830. doi:10.1016/0021-9614(82)90155-0			0.3995	0.6900	0.6530	
			0.3955	0.7550	0.7140	
			0.3922	0.7950	0.7510	
T / K =	313.10		0.3902	0.8120	0.7680	
P / bar	x ₁	y ₁	0.3868	0.8440	0.8010	
0.2592	0.1193	0.1589	0.3805	0.8970	0.8580	
0.2683	0.2498	0.2929	0.3781	0.9140	0.8790	
0.2707	0.2963	0.3348	0.3747	0.9340	0.9040	
0.2722	0.3369	0.3697				
0.2723	0.3465	0.3777	Kurihara, Kiyofumi - Uchiyama, Masanori - Kojima, Kazuo, Isothermal Vapor–Liquid Equilibria for Benzene + Cyclohexane + 1-Propanol and for Three Constituent Binary Systems, Journal of Chemical & Engineering Data. 42 (1997) 149-154. doi:10.1021/je9602475			
0.2733	0.3849	0.4093	T / K =	333.15		
0.2743	0.4366	0.4507	P / bar	x ₁	y ₁	
0.2743	0.4403	0.4537	0.5356	0.0700	0.0950	
0.2747	0.4968	0.4979	0.5358	0.0760	0.1020	
0.2747	0.4985	0.4985	0.5410	0.1020	0.1340	
0.2746	0.5304	0.5239	0.5448	0.1260	0.1640	
0.2744	0.5563	0.5441	0.5548	0.1780	0.2210	
0.2742	0.5775	0.5607	0.5561	0.2020	0.2430	
0.2733	0.6228	0.5964	0.5619	0.2340	0.2750	
0.2731	0.6284	0.6009	0.5628	0.2700	0.3090	
0.2706	0.7040	0.6634	0.5693	0.3360	0.3670	
0.2652	0.8006	0.7508	0.5702	0.3510	0.3800	
0.2564	0.9013	0.8604	0.5703	0.3740	0.4010	
			0.5744	0.4400	0.4560	
Kurihara, Kiyofumi - Uchiyama, Masanori - Kojima, Kazuo, Isothermal Vapor–Liquid Equilibria for Benzene + Cyclohexane + 1-Propanol and for Three Constituent Binary Systems, Journal of Chemical & Engineering Data. 42 (1997) 149-154. doi:10.1021/je9602475			0.5746	0.4500	0.4650	

NA-NA systems (BAC = 1)

0.5749	0.4610	0.4730		0.8003	0.4990	0.4990	AZEO
0.5752	0.4710	0.4810		0.7990	0.6180	0.6027	
0.5756	0.4780	0.4870		0.7912	0.7248	0.6962	
0.5759	0.4880	0.4950		0.7703	0.8659	0.8311	
0.5760	0.4990	0.5030					
0.5761	0.5090	0.5110					
0.5762	0.5220	0.5220	AZEO				
0.5761	0.5330	0.5310					
0.5760	0.5380	0.5350					
0.5759	0.5470	0.5420					
0.5757	0.5560	0.5490					
0.5743	0.6020	0.5870					
0.5713	0.6730	0.6440					
0.5689	0.7090	0.6770					
0.5642	0.7640	0.7270					
0.5613	0.7880	0.7490					
0.5569	0.8280	0.7900					
0.5496	0.8700	0.8360					
0.5443	0.8950	0.8650					
0.5430	0.9030	0.8730					
0.5410	0.9170	0.8890					
0.5358	0.9440	0.9220					

Boublík, T., An estimate of limiting values of relative volatility with help of the theorem of corresponding states. II. Binary systems of tetrachloromethane, benzene, and cyclohexane, Collection of Czechoslovak Chemical Communications. 28 (1963) 1771-1779. doi:10.1135/cccc19631771

T / K = 333.15			
P / bar	x ₁	y ₁	
0.5342	0.0672	0.0912	
0.5593	0.2261	0.2670	
0.5673	0.3201	0.3526	
0.5751	0.4320	0.4480	
0.5762	0.5203	0.5203	AZEO
0.5742	0.6029	0.5895	
0.5698	0.7095	0.6770	
0.5608	0.7952	0.7563	
0.5492	0.8752	0.8386	
0.5462	0.8932	0.8600	

Scatchard, George. - Wood, S. E. - Mochel, J. M., Vapor-Liquid Equilibrium. III. Benzene-Cyclohexane Mixtures., The Journal of Physical Chemistry. 43 (1939) 119-130. doi:10.1021/j150388a009

T / K = 343.13		
P / bar	x ₁	y ₁
0.7567	0.1186	0.1486
0.7798	0.2409	0.2805
0.7948	0.3759	0.3982
0.8003	0.4945	0.4975

Dong, Jilian - Feng, Chuazhuang - Li, Yonghong, Isothermal Vapor-Liquid Equilibrium for Methanol and 2,3-Dimethyl-1-butene at 343.06 K, 353.27 K, 363.19 K, and 372.90 K, Journal of Chemical & Engineering Data. 56 (2011) 2386-2392. doi:10.1021/je101304x

T / K = 403.15		
P / bar	x ₁	y ₁
3.728	0.1107	0.1301
3.776	0.1676	0.1943
3.812	0.2184	0.2426
3.851	0.2715	0.3005
3.890	0.3402	0.3645
3.919	0.3948	0.4213
3.935	0.4408	0.4560
3.950	0.4986	0.5083
3.961	0.5552	0.5619
3.965	0.6048	0.6017
3.945	0.7382	0.7276
3.888	0.8537	0.8441

Wiśniewska, Barbara - Gregorowicz, Jacek - Malanowski, Stanisław, Development of a vapour-liquid equilibrium apparatus to work at pressures up to 3 MPa, Fluid Phase Equilibria. 86 (1993) 173-186. doi:10.1016/0378-3812(93)87174-Y

T / K = 413.15		
P / bar	x ₁	y ₁
4.620	0.0996	0.1164
4.741	0.2226	0.2503
4.802	0.3086	0.3343
4.849	0.3761	0.3981
4.884	0.4506	0.4683
4.909	0.5307	0.5407
4.920	0.6335	0.6295
4.906	0.7308	0.7169
4.817	0.8827	0.8685

Wiśniewska, Barbara - Gregorowicz, Jacek - Malanowski, Stanisław, Development of a vapour-liquid equilibrium apparatus to work at pressures up to 3 MPa, Fluid Phase Equilibria. 86 (1993) 173-186. doi:10.1016/0378-3812(93)87174-Y

T / K = 423.15		
P / bar	x ₁	y ₁
5.673	0.0984	0.1156
5.814	0.2198	0.2461
5.886	0.3063	0.3316
5.947	0.3727	0.3948

NA-NA systems (BAC = 1)

5.994	0.4521	0.4685		350.83	0.5890	0.5830
6.023	0.5326	0.5420		350.91	0.6800	0.6590
6.034	0.5769	0.5775		350.97	0.6980	0.6700
6.034	0.5778	0.5778	AZEO	351.40	0.7900	0.7580
6.035	0.5920	0.5862		351.50	0.7980	0.7660
6.043	0.6381	0.6304		352.10	0.8940	0.8630
6.029	0.7256	0.7201		352.17	0.8990	0.8720
5.942	0.8785	0.8698				

Isobaric phase equilibrium data

Lafuente, C. - Pardo, J. - Santate, J. - Royo, F. - Urieta, J., Use of a Fischer-Labodest apparatus to study the liquid-vapor equilibrium of the benzene-cyclohexane system at different pressures, Rev. Acad. Cienc. Exact. Fis. Quim. Nat. Zaragoza. 47 (1992) 183-190.

P / bar = 0.4000

T / K	x ₁	y ₁	
324.35	0.0979	0.1300	
323.95	0.1487	0.1920	
323.55	0.2014	0.2464	
323.25	0.2578	0.3039	
322.95	0.3032	0.3426	
322.85	0.3382	0.3713	
322.75	0.3614	0.3919	
322.65	0.3999	0.4235	
322.45	0.4380	0.4542	
322.35	0.5160	0.5160	AZEO
322.45	0.5777	0.5668	
322.55	0.6410	0.6169	
322.75	0.6953	0.6618	
323.05	0.7675	0.7244	
323.45	0.8219	0.7797	
323.85	0.8802	0.8410	

Sieg, L., Flüssigkeit-Dampf-Gleichgewichte in binären Systemen von Kohlenwasserstoffen verschiedenen Typs: Flüssigkeit-Dampf-Gleichgewichte in binären Systemen von Kohlenwasserstoffen verschiedenen Typs, Chemie Ingenieur Technik. 22 (1950) 322-326. doi:10.1002/cite.330221503

P / bar = 1.013

T / K	x ₁	y ₁	
353.18	0.0680	0.0910	
352.90	0.1000	0.1300	
352.10	0.1880	0.2240	
352.05	0.2050	0.2400	
351.50	0.2830	0.3180	
351.51	0.2880	0.3220	
351.05	0.3850	0.4070	
351.00	0.3880	0.4120	
350.77	0.5450	0.5450	AZEO

Ridgway, Kenneth - Butler, Paul Alexander, Physical properties of the ternary system benzene-cyclohexane-hexane, Journal of Chemical & Engineering Data. 12 (1967) 509-515. doi:10.1021/je60035a012

P / bar = 1.013

T / K	x ₁	y ₁
352.95	0.0770	0.0960
352.65	0.0960	0.1180
352.40	0.1180	0.1450
352.20	0.1450	0.1760
352.00	0.1760	0.2080
351.85	0.2080	0.2430
351.65	0.2450	0.2800
351.40	0.2800	0.3140
351.25	0.3140	0.3460
351.10	0.3460	0.3750
351.00	0.3750	0.4020
350.90	0.4020	0.4260
350.80	0.6280	0.6120
350.85	0.6450	0.6280
350.90	0.6630	0.6450
350.95	0.6850	0.6630
351.05	0.7120	0.6850
351.15	0.7420	0.7120
351.20	0.7750	0.7440
351.45	0.8060	0.7750
351.70	0.8360	0.8060
351.95	0.8650	0.8360
352.20	0.8920	0.8650
352.40	0.9160	0.8920

Rao, V. N. Kumarkrishna - Swami, D. R. - Rao, M. Narasinga, Vapor-liquid equilibria of Benzene-n-hexane and benzene-cyclohexane systems, AIChE Journal. 3 (1957) 191-197. doi:10.1002/aic.690030213

P / bar = 11.44

T / K	x ₁	y ₁
462.35	0.0241	0.0260
461.25	0.1550	0.1700
460.45	0.2385	0.2613
459.75	0.3390	0.3618
458.95	0.8855	0.8777
459.35	0.9551	0.9497

573.50	0.2771	606.30	0.5489
645.60	0.3410	570.10	0.6472
697.20	0.4081	518.70	0.7098
719.60	0.4592	426.00	0.7863
713.40	0.5788	360.50	0.8300
696.30	0.6141	309.60	0.8588
672.40	0.6485	236.90	0.8967
647.80	0.6765		
596.50	0.7236		
523.50	0.7758		
437.20	0.8257		
329.10	0.8778		
197.70	0.9318		
75.70	0.9752		
Elliott, Keith - Wormald, Christopher J., A precision differential flow calorimeter the excess enthalpy of benzene + cyclohexane between 280.15 K and 393.15 K, The Journal of Chemical Thermodynamics. 8 (1976) 881-893. doi:10.1016/0021-9614(76)90166-X		Lohmann, Jürgen - Bölts, Rainer - Gmehling, Jürgen, Excess Enthalpy Data for Seven Binary Systems at Temperatures between 50 and 140 °C, Journal of Chemical & Engineering Data. 46 (2001) 208-211. doi:10.1021/je000297g	
T / K =	348.15	T / K =	413.15
P / bar =	UNKNOWN (1.0132)	P / bar =	14.10
$h^M / \text{J.mol}^{-1}$	x_1	$h^M / \text{J.mol}^{-1}$	z_1
328.10	0.1493	111.80	0.0604
411.40	0.1955	217.00	0.1196
464.30	0.2336	342.20	0.2059
536.90	0.2880	431.00	0.2895
615.60	0.3781	493.00	0.3704
651.60	0.4474	527.10	0.4490
658.40	0.5483	538.30	0.5500
614.00	0.6471	504.10	0.6470
558.20	0.7096	449.10	0.7174
461.50	0.7854	378.70	0.7857
390.50	0.8301	288.20	0.8521
337.60	0.8588	174.40	0.9167
261.40	0.8943	92.60	0.9587
Elliott, Keith - Wormald, Christopher J., A precision differential flow calorimeter the excess enthalpy of benzene + cyclohexane between 280.15 K and 393.15 K, The Journal of Chemical Thermodynamics. 8 (1976) 881-893. doi:10.1016/0021-9614(76)90166-X		-----	
T / K =	373.15	Heat capacity of mixing	
P / bar =	UNKNOWN (1.0132)	-----	
$h^M / \text{J.mol}^{-1}$	x_1	Tanaka, Reiji, Determination of excess heat capacities of (benzene + tetrachloromethane and + cyclohexane) between 293.15 and 303.15 K by use of a Picker flow calorimeter, The Journal of Chemical Thermodynamics. 14 (1982) 259-268. doi:10.1016/0021-9614(82)90016-7	
305.00	0.1493	T / K =	293.15
373.20	0.1960	P / bar =	UNKNOWN (1.0132)
427.40	0.2333	$cp^M / \text{J.mol}^{-1} \cdot \text{K}^{-1}$	x_1
492.20	0.2814	-1.012	0.0955
569.20	0.3773	-1.796	0.1944
600.20	0.4474	-2.424	0.2972
		-2.795	0.3916
		-2.981	0.4980
		-2.936	0.5953
		-2.654	0.6966
		-2.120	0.7957
		-1.302	0.8931

Páramo, R. - Zouine, M. - Casanova, C., New Batch Cells Adapted To Measure Saturated Heat Capacities of Liquids, Journal of Chemical & Engineering Data. 47 (2002) 441-448. doi:10.1021/je0155103

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-1.010	0.1044
-1.840	0.1997
-2.370	0.2934
-2.720	0.3995
-2.910	0.5004
-2.820	0.5969
-2.600	0.7034
-2.090	0.8022
-1.180	0.8979

D'arcy, Patrick J. - Hazlett, John D. - Kiyohara, Osamu - Benson, George C., Excess heat capacities of mixtures of benzene with cyclohexane at 298.15 K, Thermochemica Acta. 21 (1977) 297-300. doi:10.1016/0040-6031(77)85030-2

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.9900	0.0981
-1.061	0.1076
-1.724	0.1965
-1.770	0.1974
-1.807	0.1999
-2.301	0.2873
-2.337	0.2883
-2.717	0.3956
-2.751	0.3966
-2.906	0.5009
-2.872	0.5041
-2.885	0.5183
-2.835	0.5954
-2.857	0.5959
-2.588	0.6960
-2.504	0.7052
-2.052	0.7953
-2.032	0.7994
-1.979	0.8017
-1.283	0.8911
-1.152	0.9020

Tanaka, Reiji, Determination of excess heat capacities of (benzene + tetrachloromethane and + cyclohexane) between 293.15 and 303.15 K by use of a Picker flow calorimeter, The Journal of Chemical Thermodynamics. 14 (1982) 259-268. doi:10.1016/0021-9614(82)90016-7

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-1.068	0.1079
-1.084	0.1096
-1.824	0.2029
-1.842	0.2053
-2.406	0.3023
-2.410	0.3033
-2.764	0.3969
-2.776	0.4023
-2.924	0.4968
-2.930	0.5030
-2.872	0.6044
-2.831	0.6200
-2.568	0.7029
-2.564	0.7060
-2.043	0.7988
-2.047	0.7994
-1.335	0.8866
-1.243	0.8955

Grolier, J.-P. E. - Wilhelm, Emmerich - Hamedi, M. H., Molar Heat Capacity and Isothermal Compressibility of Binary Liquid Mixtures: Carbon Tetrachloride + Benzene, Carbon Tetrachloride + Cyclohexane and Benzene + Cyclohexane, Berichte der Bunsengesellschaft für physikalische Chemie. 82 (1978) 1282-1290. doi:10.1002/bbpc.19780821204

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-1.215	0.1231
-1.788	0.1994
-2.419	0.3124
-2.661	0.3768
-2.807	0.4252
-2.911	0.5035
-2.769	0.6285
-2.388	0.7356
-1.686	0.8433
-1.309	0.8848
-1.099	0.9148

Tanaka, Reiji, Determination of excess heat capacities of (benzene + tetrachloromethane and + cyclohexane) between 293.15 and 303.15 K by use of a Picker flow calorimeter, The Journal of Chemical Thermodynamics. 14 (1982) 259-268. doi:10.1016/0021-9614(82)90016-7

T / K = 303.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
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NA-NA systems (BAC = 1)

-1.168	0.1208	553.12	42.31	0.2500
-1.813	0.2046	553.16	41.94	0.2000
-2.408	0.3093	553.18	42.67	0.3000
-2.728	0.3993	553.23	41.61	0.1500
-2.888	0.5073	553.33	43.03	0.3500
-2.820	0.6055	553.34	41.30	0.1000
-2.501	0.7090	553.52	41.03	0.0500
-1.965	0.8058	553.55	43.40	0.4000
-1.213	0.8966	553.81	43.78	0.4500

Páramo, R. - Zouine, M. - Casanova, C., New Batch Cells Adapted To Measure Saturated Heat Capacities of Liquids, Journal of Chemical & Engineering Data. 47 (2002) 441-448. doi:10.1021/je0155103

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.8800	0.1040
-1.630	0.1995
-2.300	0.2984
-2.700	0.3968
-2.840	0.4979
-2.800	0.5982
-2.430	0.7017
-1.810	0.8063
-1.150	0.8979

Páramo, R. - Zouine, M. - Casanova, C., New Batch Cells Adapted To Measure Saturated Heat Capacities of Liquids, Journal of Chemical & Engineering Data. 47 (2002) 441-448. doi:10.1021/je0155103

T / K = 318.15

P / bar = UNKNOWN (1.0132)

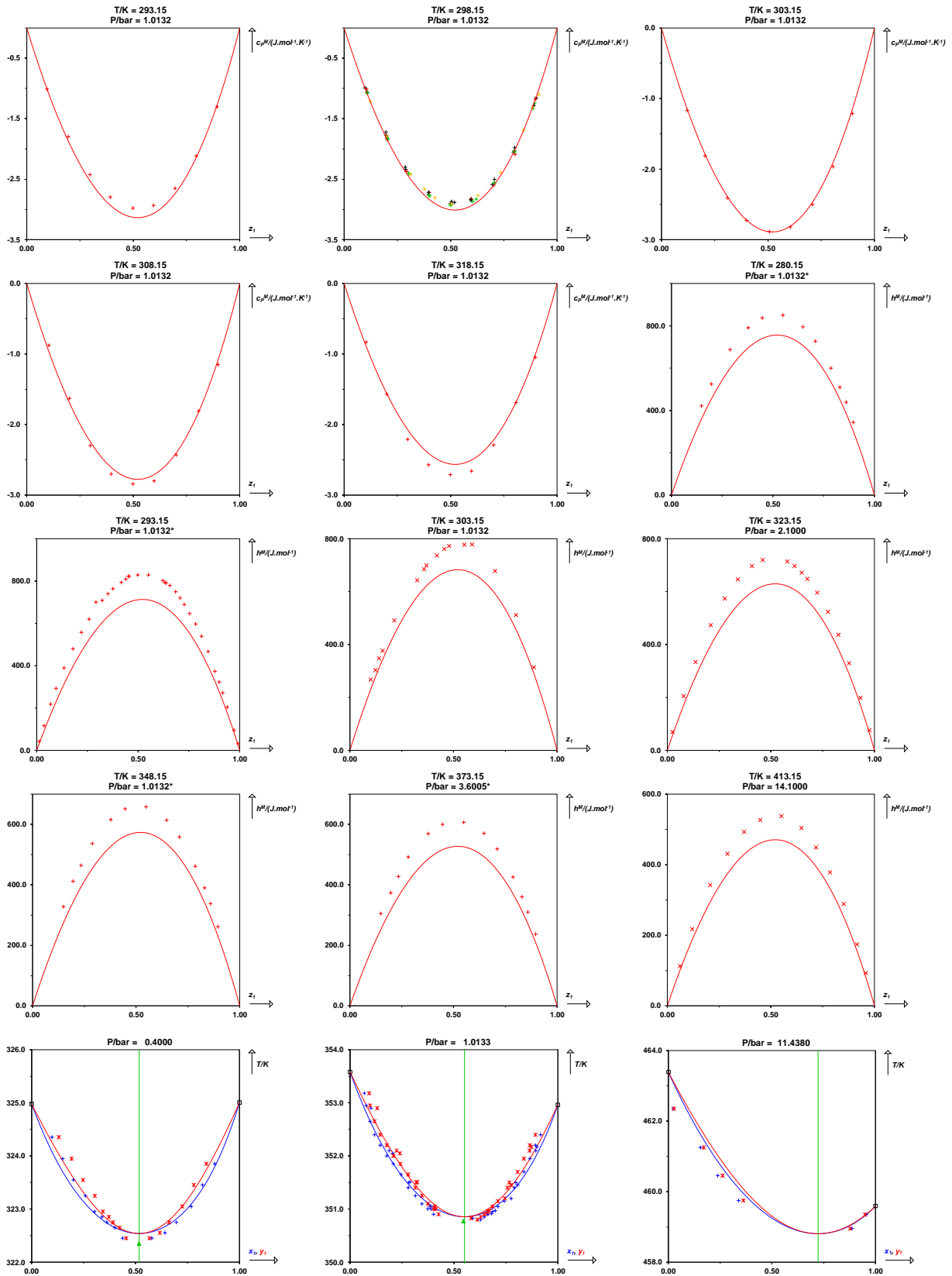
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.8300	0.1040
-1.570	0.1995
-2.210	0.2984
-2.570	0.3968
-2.710	0.4979
-2.660	0.5982
-2.290	0.7017
-1.690	0.8063
-1.050	0.8979

Critical point

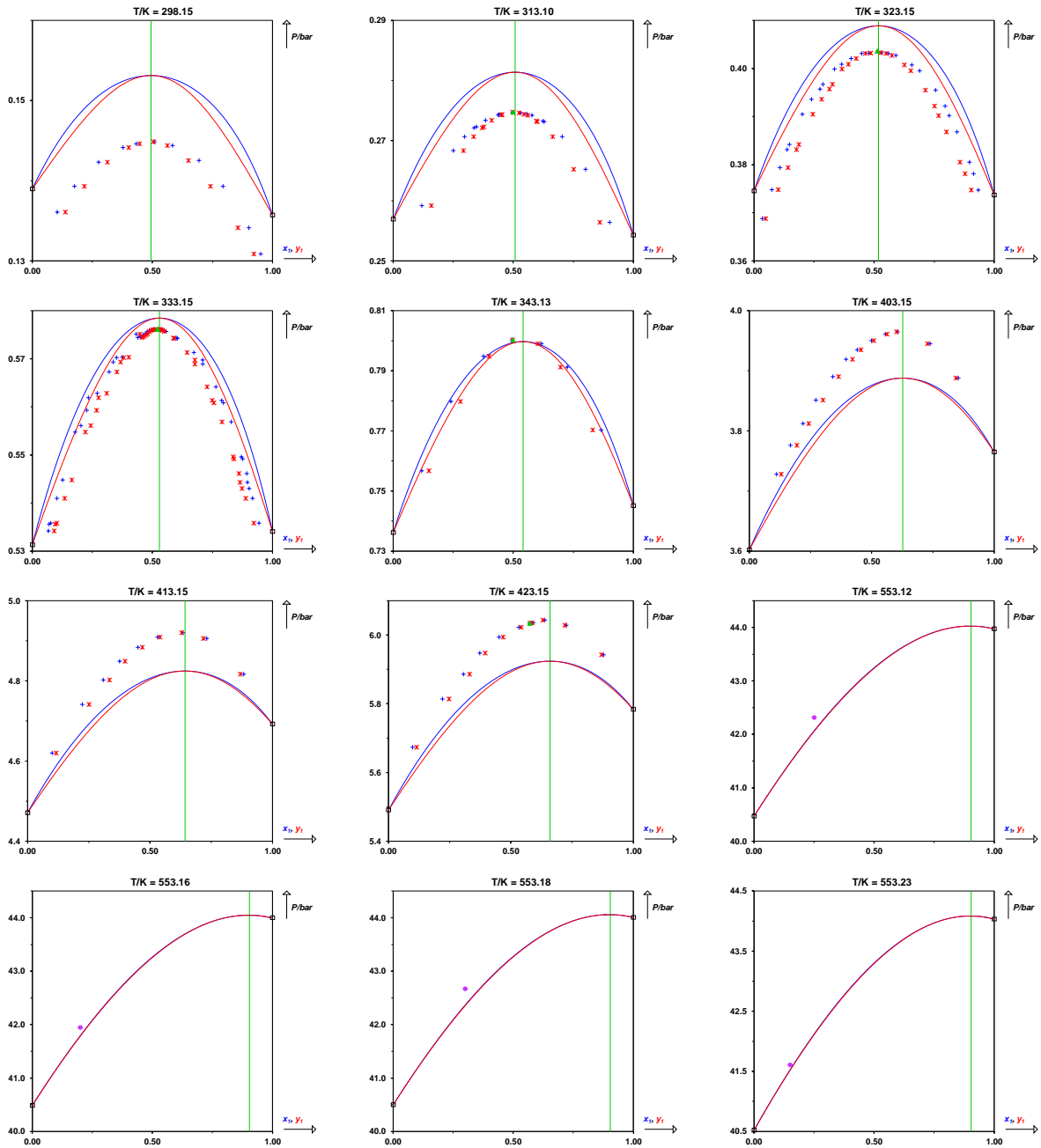
Hissong, D.W. - Kay, W.B., Critical properties of hydrocarbons. II. Correlational studies, Proc. Am. Pet. Inst. Refin. Dep. 48 (1968) 397-463.

T / K	P / bar	x_1
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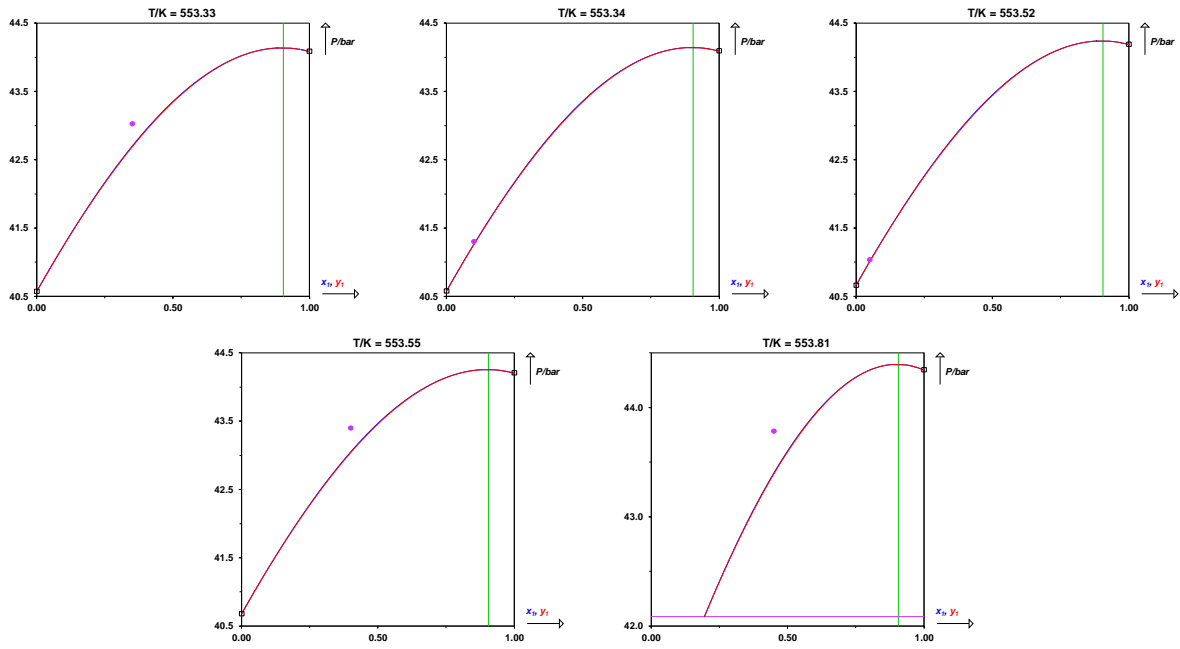
NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



BENZENE (1) + TOLUENE (2)

CAS	71-43-2	108-88-3
InChiKey	UHOVQNZJYSORNB-UHFFFAOYSA-N	YXFVVABEGXRONW-UHFFFAOYSA-N
T_c / K	562.05	591.75
P_c / bar	48.95	41.08
ω	0.210	0.264

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 2.327$

$B/\text{MPa} = 5.369$

Deviations

MAPE on $x = 7.3\%$

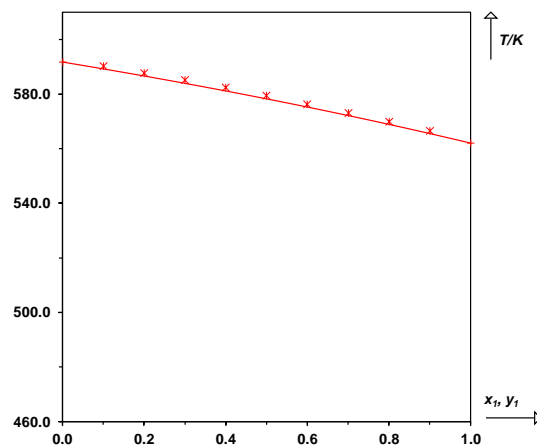
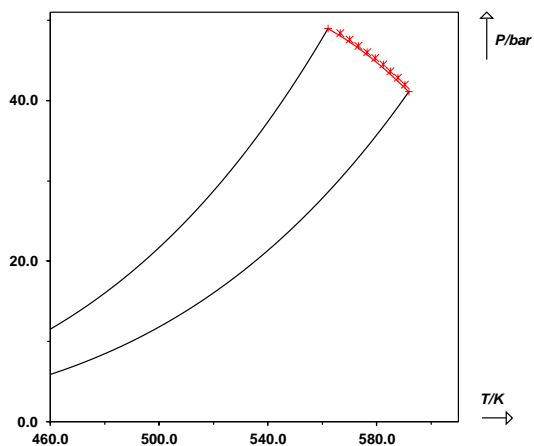
MAPE on $y = 6.5\%$

MAPE on $x_c = 11\%$

MAPE on $P_c = 0.80\%$

MAPE on $h^M = 5.2\%$

MAPE on $c_p^M = 5.3\%$



Isothermal phase equilibrium data

Kassmann, K.-D. - Knapp, H., Vapor-Liquid Equilibria for Binary and Ternary Mixtures of Benzene, Toluene and n-Butyraldehyde, Berichte der Bunsengesellschaft für physikalische Chemie. 90 (1986) 452-458.

doi:10.1002/bbpc.19860900514

T / K = 313.15

P / bar	x ₁	y ₁
0.0854	0.0401	0.1128
0.0952	0.0992	0.2514
0.1197	0.2484	0.5020
0.1309	0.3094	0.5839
0.1335	0.3315	0.6012
0.1431	0.3854	0.6599
0.1561	0.4673	0.7273
0.1678	0.5398	0.7801
0.1812	0.6209	0.8312
0.1962	0.7068	0.8797
0.2089	0.7899	0.9181
0.2208	0.8616	0.9490
0.2328	0.9352	0.9773

Kassmann, K.-D. - Knapp, H., Vapor-Liquid Equilibria for Binary and Ternary Mixtures of Benzene, Toluene and n-Butyraldehyde, Berichte der Bunsengesellschaft für physikalische Chemie. 90 (1986) 452-458.

doi:10.1002/bbpc.19860900514

T / K = 334.15

P / bar	x ₁	y ₁
0.2157	0.0622	0.1535
0.2333	0.1140	0.2589
0.2517	0.1680	0.3516
0.2752	0.2334	0.4519
0.2996	0.3003	0.5390
0.3121	0.3368	0.5802
0.3433	0.4288	0.6683
0.3620	0.4799	0.7128
0.3999	0.5873	0.7949
0.4233	0.6571	0.8372
0.4692	0.7891	0.9091
0.4856	0.8374	0.9332
0.5065	0.8981	0.9574
0.5235	0.9478	0.9810

Isobaric phase equilibrium data

Saito, S., Separation of hydrocarbons. 2. Vapor-liquid equilibriums of normal paraffin-aromatic systems, Asahi

Garasu Kogyo Gijutsu Shoreikai Kenkyu Hokoku. 15 (1969) 397-407.

P / bar = 1.013

T / K	x ₁	y ₁
381.85	0.0520	0.1100
380.35	0.0830	0.1720
379.05	0.1190	0.2380
378.25	0.1410	0.2740
377.05	0.1730	0.3220
375.95	0.1940	0.3600
374.65	0.2240	0.4020
373.75	0.2530	0.4340
372.15	0.2990	0.5010
371.45	0.3140	0.5230
369.75	0.3660	0.5810
367.85	0.4330	0.6430
365.85	0.5020	0.7060
363.85	0.5710	0.7610
362.25	0.6210	0.8010
360.25	0.7050	0.8530
358.45	0.7690	0.8890
357.35	0.8200	0.9190
356.25	0.8790	0.9460
354.95	0.9310	0.9680
354.45	0.9610	0.9830

Zhangli Jin - Aibao Hu - Kunyuan Liu, VLE of Binary and Ternary Systems for BTX Mixtures, Chemical Engineering (China). 6 (1991)

P / bar = 1.013

T / K	x ₁	y ₁
382.65	0.0333	0.0714
380.58	0.0780	0.1625
379.05	0.1136	0.2323
375.25	0.2056	0.3757
373.35	0.2588	0.4511
371.34	0.3179	0.5240
369.59	0.3731	0.5858
368.88	0.3952	0.6049
366.64	0.4616	0.6761
364.40	0.5326	0.7375
362.28	0.6125	0.7935
360.62	0.6742	0.8353
359.65	0.7193	0.8622
358.00	0.7832	0.9002
355.97	0.8732	0.9430
354.68	0.9315	0.9700
353.67	0.9767	0.9900

Schuberth, Horst, Phasengleichgewichtsmessungen. II. Vorausberechnung von Gleichgewichtsdaten dampfförmig-flüssig idealer Systeme und Prüfung derselben mittels einer neuen Gleichgewichtsapparatur, Journal für Praktische Chemie. 6 (1958) 129-138. doi:10.1002/prac.19580060209

P / bar =	1.013	
T / K	x ₁	y ₁
378.90	0.1070	0.2190
374.90	0.2070	0.3810
371.40	0.3030	0.5090
368.40	0.3930	0.6090
365.60	0.4860	0.6960
363.00	0.5780	0.7690
360.50	0.6730	0.8350
358.10	0.7730	0.8930
355.80	0.8750	0.9450

Enthalpy of mixing

Baud, E., Thermal analysis of binary mixtures, Bull. Soc. Chim. Fr. 17 (1915) 329-345.

T / K =	290.65	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
65.11	0.3240	
75.33	0.4900	
70.34	0.6000	
56.13	0.7500	
35.92	0.8570	

Hsu, Kuei-Yen - Lawrence Clever, H, The excess enthalpies of the 15 binary mixtures formed from cyclohexane, benzene, toluene, 1,4-dimethylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene at 298.15 K, The Journal of Chemical Thermodynamics. 7 (1975) 435-442. doi:10.1016/0021-9614(75)90273-6

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
30.00	0.1374	
46.23	0.2369	
62.55	0.3785	
66.99	0.4593	
67.40	0.5443	
65.02	0.6268	
58.99	0.7009	
49.54	0.7663	
32.38	0.8650	

Murakami, S. - Lam, V.T. - Benson, G.C., The thermodynamic properties of binary aromatic systems II. Excess enthalpies and volumes of benzene + toluene and toluene + isomeric xylene mixtures at 25 °C, The Journal of Chemical Thermodynamics. 1 (1969) 397-407. doi:10.1016/0021-9614(69)90070-6

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
9.600	0.0393	
19.10	0.0804	
28.00	0.1248	
37.20	0.1746	
45.00	0.2227	
52.60	0.2783	
58.60	0.3383	
63.60	0.3938	
66.20	0.4395	
67.80	0.4668	
67.80	0.4890	
68.40	0.5065	
68.10	0.5317	
68.10	0.5474	
67.70	0.5719	
66.80	0.5920	
66.20	0.6090	
64.20	0.6390	
60.40	0.6839	
54.90	0.7311	
47.70	0.7848	
40.80	0.8262	
32.20	0.8705	
23.40	0.9101	
12.80	0.9533	

Diaz Pena, M. - Menduina, C., Semicontinuous calorimeter for measuring heats of mixing, An. Quim. 69 (1973) 857-868.

T / K =	323.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
10.00	0.0358	
17.00	0.0709	
23.00	0.1040	
28.00	0.1351	
32.00	0.1630	
35.00	0.1866	
38.00	0.2112	
40.00	0.2336	
43.00	0.2559	
45.00	0.2783	

NA-NA systems (BAC = 1)

46.00	0.2970	569.95	47.61	0.8000
48.00	0.3137	573.15	46.82	0.7000
49.00	0.3313	576.35	46.04	0.6000
50.00	0.3487	579.45	45.26	0.5000
50.00	0.3655	582.35	44.46	0.4000
51.00	0.3817	585.05	43.66	0.3000
52.00	0.3974	587.65	42.84	0.2000
52.00	0.4092	590.25	42.01	0.1000
52.00	0.4206			
52.00	0.4315			
52.00	0.4399			
52.00	0.5132			
52.00	0.5412			
51.00	0.5725			
51.00	0.6073			
50.00	0.6456			
49.00	0.6887			
44.00	0.7382			
38.00	0.7955			
29.00	0.8618			
14.00	0.9411			

Heat capacity of mixing

Fortier, Jean Luc - Benson, George C., Heat capacities of some binary aromatic hydrocarbon mixtures containing benzene or toluene, Journal of Chemical & Engineering Data. 24 (1979) 34-37. doi:10.1021/je60080a015

T / K = 298.15

P / bar = UNKNOWN (1.0132)

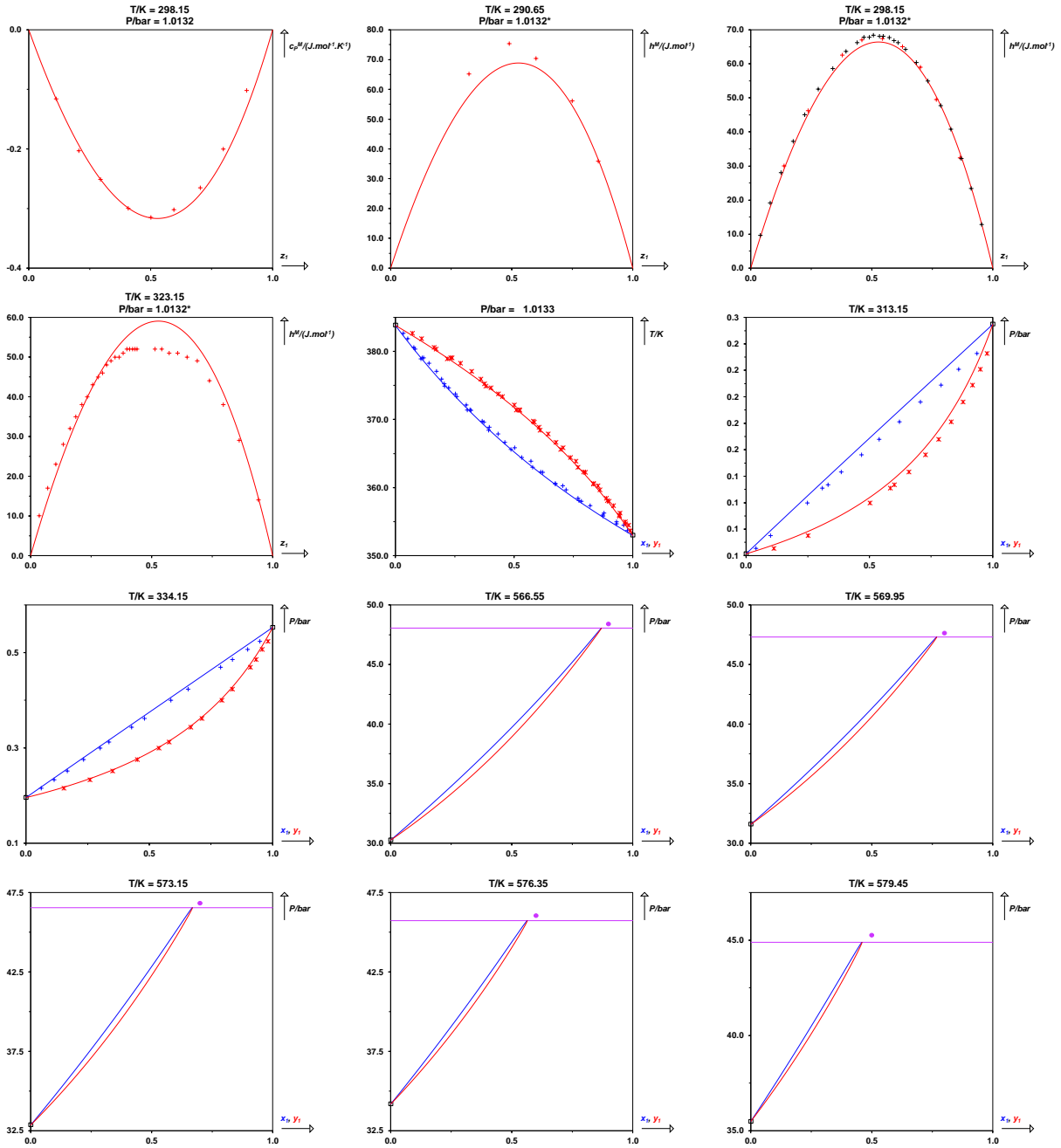
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.1160	0.1127
-0.2030	0.2055
-0.2510	0.2937
-0.3000	0.4070
-0.3150	0.5006
-0.3020	0.5946
-0.2650	0.7031
-0.2000	0.7968
-0.1020	0.8930

Critical point

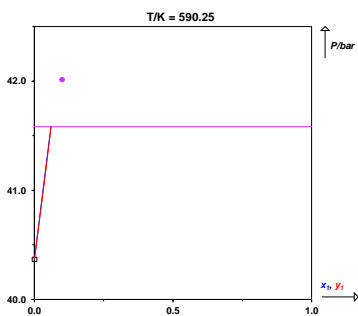
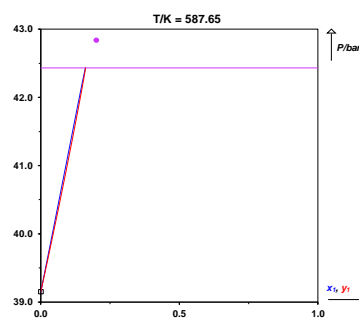
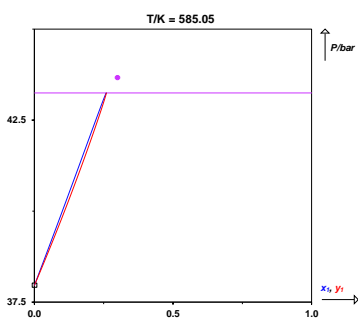
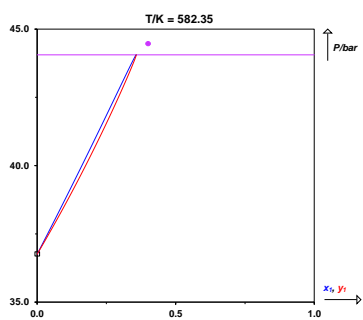
Kay, W.B. - Hissong, D., The critical properties of hydrocarbons. I. Simple mixtures, Proc. Am. Pet. Inst. Refin. Dep. 47 (1967) 653-722.

T / K	P / bar	x_1
566.55	48.37	0.9000

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



BENZENE (1) + n-HEPTANE (2)

CAS	71-43-2	142-82-5
InChiKey	UHOVQNZJYSORNB-UHFFFAOYSA-N	IMNFDUFMRHMDMM-UHFFFAOYSA-N
T_c / K	562.05	540.20
P_c / bar	48.95	27.40
ω	0.210	0.349

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 30.94$

$B/\text{MPa} = 65.41$

Deviations

MAPE on $x = 12\%$

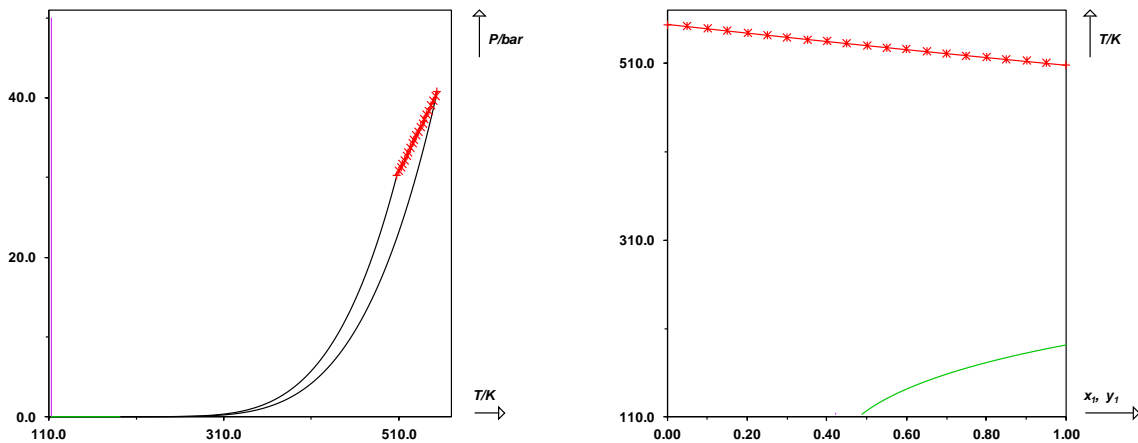
MAPE on $y = 8.9\%$

MAPE on $x_c = 15\%$

MAPE on $P_c = 4.2\%$

MAPE on $h^M = 6.5\%$

MAPE on $c_p^M = 4.0\%$



-----			P / bar	x ₁	y ₁
Isothermal phase equilibrium data			0.1242	0.1438	0.3208
-----			0.1401	0.2411	0.4567
Werner, Günter - Schuberth, Horst, Das Phasengleichgewicht flüssig-flüssig des Systems Benzol/n-Heptan/Acetonitril sowie die Phasengleichgewichte dampfförmig-flüssig der entsprechenden binären Systeme bei 20,0 °C, Journal für Praktische Chemie. 31 (1966) 225-239. doi:10.1002/prac.19660310501			0.1438	0.2574	0.4756
T / K = 293.15			0.1536	0.3278	0.5482
P / bar	x ₁	y ₁	0.1648	0.4252	0.6299
0.0507	0.0280	0.0900	0.1685	0.4679	0.6607
0.0557	0.0700	0.2050	0.1699	0.4773	0.6671
0.0615	0.1320	0.3280	0.1787	0.5722	0.7272
0.0668	0.1840	0.4100	0.1803	0.6033	0.7453
0.0700	0.2260	0.4660	0.1864	0.6941	0.7957
0.0740	0.2790	0.5250	0.1944	0.8226	0.8668
0.0773	0.3300	0.5750	0.1977	0.9001	0.9158
0.0836	0.4410	0.6570	Messow, U. - Schuetze, D. - Pfestorf, R. - Kuchenbecker, D. - Suehnel, K., Thermodynamische Untersuchungen an Lösungsmittel/n-Paraffin-Systemen, Z. Phys. Chem. Leipzig. 258 (1977) 24-32.		
0.0871	0.5060	0.7010	T / K = 313.15		
0.0889	0.5520	0.7210	P / bar	x ₁	y ₁
0.0929	0.6530	0.7780	0.1488	0.1180	0.2750
0.0965	0.7540	0.8340	0.1725	0.2440	0.4520
0.0979	0.8010	0.8590	0.1815	0.3030	0.5190
0.0995	0.8690	0.8990	0.2107	0.5120	0.6830
0.0999	0.8880	0.9100	0.2221	0.6330	0.7550
Harris, Kenneth R. - Dunlop, Peter J., Vapour pressures and excess Gibbs energies of mixtures of benzene with chlorobenzene, n-hexane, and n-heptane at 25°C, The Journal of Chemical Thermodynamics. 2 (1970) 805-811. doi:10.1016/0021-9614(70)90023-6			0.2287	0.6990	0.7970
T / K = 298.15			0.2333	0.7710	0.8400
P / bar	x ₁	y ₁	0.2395	0.8440	0.8830
0.0736	0.0965	0.2477	Palmer, David A. - Smith, Buford D., Thermodynamic excess property measurements for acetonitrile-benzene-n-heptane system at 45°C, Journal of Chemical & Engineering Data. 17 (1972) 71-76. doi:10.1021/je60052a037		
0.0815	0.1665	0.3692	T / K = 318.15		
0.0944	0.2942	0.5283	P / bar	x ₁	y ₁
0.1019	0.3854	0.6092	0.1687	0.0604	0.1551
0.1025	0.3914	0.6144	0.1836	0.1180	0.2645
0.1091	0.4899	0.6831	0.1907	0.1432	0.3082
0.1092	0.4903	0.6836	0.2108	0.2370	0.4396
0.1093	0.4905	0.6841	0.2211	0.2841	0.4906
0.1157	0.6027	0.7501	0.2271	0.3105	0.5237
0.1199	0.6936	0.7985	0.2389	0.3777	0.5783
0.1236	0.8017	0.8558	0.2443	0.4195	0.6157
0.1260	0.8892	0.9087	0.2561	0.4798	0.6672
Sun, Y. - Yen, W.H., Vapor Pressures and Excess Gibbs Free Energies of Benzene-Cyclohexane, Benzene-n-Heptane and Cyclohexane-n-Heptane, Gaodeng Xuexiao Huaxue Xuebao. 7 (1986) 54-58.			0.2680	0.5856	0.7288
T / K = 308.19			0.2749	0.6412	0.7639
			0.2798	0.6913	0.7893
			0.2890	0.7738	0.8415
			0.2968	0.9183	0.9288
			0.3001	0.9779	0.9759

NA-NA systems (BAC = 1)

Kudryavtseva, L.S. - Viit, H. - Eisen, O.G., Vapor-liquid equilibrium in 1-heptene-heptane, 1-heptene-octane, heptane-octane, benzene-thiophene, benzene-heptane, and thiophene-heptane binary systems at 55.deg., Eesti NSV Tead. Akad. Toim. Keem. Geol. 20 (1971) 292-296.

T / K =	328.15	
P / bar	x ₁	y ₁
0.2367	0.0100	0.0340
0.2421	0.0200	0.0650
0.2580	0.0500	0.1480
0.2725	0.0830	0.2180
0.3000	0.1590	0.3390
0.3153	0.2100	0.4010
0.3286	0.2570	0.4530
0.3489	0.3360	0.5300
0.3629	0.4000	0.5820
0.3780	0.4730	0.6380
0.3913	0.5400	0.6870
0.4018	0.6000	0.7270
0.4114	0.6600	0.7660
0.4204	0.7200	0.8040
0.4274	0.7770	0.8380
0.4312	0.8110	0.8590
0.4353	0.8600	0.8860
0.4390	0.9120	0.9250

Hanson, Donald O. - Van Winkle, Matthew, Alteration of the relative volatility of hexane-1-hexene by oxygenated and chlorinated solvents, Journal of Chemical & Engineering Data. 12 (1967) 319-325. doi:10.1021/je60034a009

T / K =	333.15	
P / bar	x ₁	y ₁
0.3165	0.0870	0.1870
0.3172	0.0880	0.1880
0.3537	0.1800	0.3400
0.3875	0.2800	0.4630
0.4233	0.4040	0.5780
0.4744	0.6180	0.7380
0.4916	0.7130	0.7960
0.5040	0.7950	0.8470
0.5164	0.9070	0.9220
0.5178	0.9080	0.9230

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K =	353.15	
P / bar	x ₁	y ₁
0.5876	0.0240	0.0490

0.6765	0.1500	0.2680
0.6867	0.1650	0.2880
0.7110	0.2010	0.3430
0.7317	0.2320	0.3800
0.7638	0.2880	0.4440
0.8935	0.5500	0.6780
0.9198	0.6210	0.7250
0.9503	0.7110	0.7880

Messow, U. - Schuetze, D. - Pfestorf, R. - Kuchenbecker, D. - Suehnel, K., Thermodynamische Untersuchungen an Lösungsmittel/n-Paraffin-Systemen, Z. Phys. Chem. Leipzig. 258 (1977) 24-32.

T / K =	353.15	
P / bar	x ₁	y ₁
0.7182	0.2130	0.3650
0.7398	0.2460	0.4070
0.7571	0.2780	0.4450
0.7729	0.2980	0.4680
0.7969	0.3490	0.5190
0.8762	0.5100	0.6570
0.9049	0.5830	0.7080
0.9295	0.6260	0.7390
0.9427	0.6910	0.7860
0.9747	0.7830	0.8500
0.9798	0.8040	0.8620

Brown, I, Liquid-Vapour Equilibria. III. The Systems Benzene- n-heptane, n-Hexane-chlorobenzene, and cyclohexane-nitrobenzene, Australian Journal of Chemistry. 5 (1952) doi:10.1071/CH9520530

T / K =	353.15	
P / bar	x ₁	y ₁
0.6061	0.0464	0.0988
0.6350	0.0861	0.1729
0.7125	0.2004	0.3473
0.7593	0.2792	0.4412
0.8180	0.3842	0.5464
0.8668	0.4857	0.6304
0.9063	0.5824	0.7009
0.9450	0.6904	0.7759
0.9730	0.7842	0.8384
0.9979	0.8972	0.9149

Brown, I - Ewald, Ah, Liquid-Vapour Equilibria II. The System Benzene-Heptane, Australian Journal of Chemistry. 4 (1951) doi:10.1071/CH9510198

T / K =	353.15	
P / bar	x ₁	y ₁
0.5868	0.0211	0.0429
0.6040	0.0458	0.0901

0.6383	0.0929	0.1723	359.82	0.4090	0.5660
0.7029	0.1895	0.3224	358.88	0.4570	0.6040
0.7635	0.2883	0.4399	357.86	0.5190	0.6560
0.8194	0.3909	0.5446	357.90	0.5240	0.6570
0.8691	0.4951	0.6315	357.07	0.5760	0.6980
0.9046	0.5819	0.6930	356.84	0.5860	0.7060
0.9420	0.6848	0.7668	356.61	0.6080	0.7190
0.9955	0.8832	0.9038	355.85	0.6590	0.7560
1.010	0.9793	0.9810	355.44	0.6980	0.7790

Isobaric phase equilibrium data

Nielsen, R. L. - Weber, J. H., Vapor-Liquid Equilibria at Subatmospheric Pressures. Binary and Ternary Systems Containing Ethyl Alcohol, Benzene, and n-Heptane., Journal of Chemical & Engineering Data. 4 (1959) 145-151. doi:10.1021/je60002a011

P / bar = 0.5333

T / K	x ₁	y ₁
347.05	0.1000	0.2180
343.65	0.2000	0.3730
341.15	0.3000	0.4900
339.15	0.4000	0.5830
337.55	0.5000	0.6600
336.45	0.6000	0.7270
335.25	0.7000	0.7880
334.55	0.8000	0.8490
333.95	0.9000	0.9160

Sieg, L., Flüssigkeit-Dampf-Gleichgewichte in binären Systemen von Kohlenwasserstoffen verschiedenen Typs: Flüssigkeit-Dampf-Gleichgewichte in binären Systemen von Kohlenwasserstoffen verschiedenen Typs, Chemie Ingenieur Technik. 22 (1950) 322-326. doi:10.1002/cite.330221503

P / bar = 1.013

T / K	x ₁	y ₁
368.73	0.0770	0.1520
368.58	0.0880	0.1680
366.86	0.1340	0.2490
366.67	0.1440	0.2540
366.50	0.1520	0.2680
364.75	0.2020	0.3460
364.75	0.2030	0.3420
364.11	0.2300	0.3820
362.97	0.2770	0.4270
362.25	0.2990	0.4550
361.83	0.3180	0.4740
361.03	0.3530	0.5120
360.05	0.4030	0.5540

354.97	0.7240	0.8000
354.75	0.7710	0.8300
353.90	0.8300	0.8700
353.90	0.8310	0.8700
353.60	0.8940	0.9150
353.42	0.9340	0.9460
353.40	0.9350	0.9470
353.30	0.9850	0.9860

Michishita, T. - Arai, Y. - Saito, S., Vapor-liquid equilibriums of hydrocarbons at atmospheric pressure, Kagaku Kogaku. 35 (1971) 111-0. doi:10.1252/kakoronbunshu1953.35.111

P / bar = 1.013

T / K	x ₁	y ₁
370.55	0.0230	0.0480
367.15	0.1160	0.2170
366.05	0.1510	0.2690
364.85	0.1920	0.3250
363.45	0.2440	0.3900
361.45	0.3230	0.4830
361.25	0.3320	0.4870
361.15	0.3340	0.4940
360.95	0.3420	0.5020
359.75	0.4060	0.5610
358.85	0.4480	0.5990
357.25	0.5490	0.6790
356.35	0.6100	0.7230
355.55	0.6750	0.7680
355.25	0.6990	0.7820
354.95	0.7290	0.8020
354.75	0.7450	0.8130
354.45	0.7680	0.8270
354.05	0.8250	0.8640
353.75	0.8810	0.9010
353.55	0.9030	0.9220
353.35	0.9400	0.9490

Wang, Q. - Chen, G. - Han, S., Study on the Vapor-Liquid Equilibria under Pressure for Binary Systems, Ranliao Huaxue Xuebao. 18 (1990) 185-192.

NA-NA systems (BAC = 1)

P / bar =	3.025		831.75	0.7645
T / K	x_1	y_1	741.15	0.7960
410.34	0.0956	0.1593	602.90	0.8282
407.14	0.1927	0.2929		
404.07	0.3052	0.4208		
401.58	0.4008	0.5249		
398.74	0.5503	0.6467		
397.22	0.6459	0.7304		
396.68	0.6735	0.7542		
395.26	0.7740	0.8309		
394.38	0.8569	0.8858		
393.73	0.9656	0.9706		
Wang, Q. - Chen, G. - Han, S., Study on the Vapor-Liquid Equilibria under Pressure for Binary Systems, Ranliao Huaxue Xuebao. 18 (1990) 185-192.				
P / bar =	8.106			
T / K	x_1	y_1		
461.49	0.0030	0.0042		
459.56	0.0748	0.1028		
458.10	0.1248	0.1690		
456.09	0.1988	0.2636		
453.84	0.2751	0.3547		
451.14	0.3744	0.4651		
449.20	0.4510	0.5436		
446.75	0.5513	0.6383		
444.70	0.6491	0.7212		
442.17	0.7795	0.8204		
440.99	0.8704	0.8875		
<hr/>				
Enthalpy of mixing				
<hr/>				
Vilcu, R. - Stanciu, F., Excess thermodynamic functions from calorimetric data, Rev. Roum. Chim. 11 (1966) 175-182.				
T / K =	288.15			
P / bar =	UNKNOWN (1.0132)			
$h^M / J.mol^{-1}$	x_1			
219.81	0.0811			
385.39	0.1536			
568.19	0.2188			
709.12	0.2776			
834.55	0.3309			
915.28	0.3793			
970.50	0.4234			
1008.4	0.4636			
1005.0	0.5005			
979.38	0.7041			
912.97	0.7339			
Benson, George C. - Benson, George C. - Anand, Subhash C. - Kiyohara, Osamu, Thermodynamic properties of some cycloalkane-cycloalkanol systems at 298. 15.deg.K. II, Journal of Chemical & Engineering Data. 19 (1974) 258-261. doi:10.1021/je60062a027				
T / K =	293.15			
P / bar =	1.010			
$h^M / J.mol^{-1}$	z_1			
265.43	0.0990			
494.57	0.1906			
696.83	0.2756			
848.66	0.3547			
913.60	0.4284			
981.31	0.4973			
996.37	0.5619			
996.93	0.6225			
954.01	0.6795			
878.41	0.7332			
776.91	0.7839			
654.81	0.8318			
500.71	0.8772			
323.53	0.9203			
123.03	0.9611			
Benson, George C. - Benson, George C. - Anand, Subhash C. - Kiyohara, Osamu, Thermodynamic properties of some cycloalkane-cycloalkanol systems at 298. 15.deg.K. II, Journal of Chemical & Engineering Data. 19 (1974) 258-261. doi:10.1021/je60062a027				
T / K =	298.15			
P / bar =	1.010			
$h^M / J.mol^{-1}$	z_1			
233.01	0.0990			
410.01	0.1906			
596.14	0.2756			
760.89	0.3547			
864.75	0.4284			
911.31	0.4973			
957.34	0.5619			
958.92	0.6225			
925.41	0.6795			
859.45	0.7332			
771.27	0.7839			
635.37	0.8318			
491.73	0.8772			
313.03	0.9203			
126.18	0.9611			

		491.11	0.2022
Benson, George C. - Benson, George C. - Anand, Subhash C. - Kiyohara, Osamu, Thermodynamic properties of some cycloalkane-cycloalkanol systems at 298. 15.deg.K. II, Journal of Chemical & Engineering Data. 19 (1974) 258-261. doi:10.1021/je60062a027		642.26	0.2828
T / K =	303.15	741.90	0.3487
P / bar =	1.010	806.80	0.4034
$h^M / \text{J.mol}^{-1}$	z_1	869.18	0.4819
204.79	0.0990	892.63	0.5646
414.18	0.1906	888.02	0.5991
574.10	0.2756	874.62	0.6226
709.49	0.3547	878.81	0.6245
812.70	0.4284	828.57	0.6875
873.10	0.4973	742.74	0.7557
894.88	0.5619	608.76	0.8250
881.90	0.6225	428.31	0.8919
830.61	0.6795	215.20	0.9519
766.57	0.7332		
703.39	0.7839	----- Heat capacity of mixing -----	
585.05	0.8318	Tanaka, Reiji, Excess heat capacities for mixture of benzene with n-heptane at 293.15, 298.15, and 303.15 K, Journal of Chemical & Engineering Data. 32 (1987) 176-177. doi:10.1021/je00048a014	
445.40	0.8772	T / K =	293.15
300.37	0.9203	P / bar =	UNKNOWN (1.0132)
130.17	0.9611	$c_P^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
		-1.008	0.0919
		-1.992	0.1968
		-2.721	0.2947
		-3.220	0.3855
		-3.543	0.4861
		-3.633	0.5840
		-3.443	0.6908
		-3.021	0.7773
		-2.078	0.8814
		Karbalai Ghassemi, M.H. - Grolier, J.P.E., Excess heat capacity. Cyclohexane-n-hexane system, Int. Data Ser. Sel. Data Mixtures Ser. A. 1976 (1976) 95-96.	
		T / K =	298.20
		P / bar =	UNKNOWN (1.0132)
		$c_P^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
		-0.5830	0.0487
		-1.857	0.1928
		-2.530	0.2880
		-3.030	0.3886
		-3.065	0.4007
		-3.315	0.4929
		-3.456	0.5841
		-3.407	0.6310
		-3.336	0.6558
Hammerl, I. - Raetzsch, M.T., Enthalpies of mixing of normal paraffins with aromatics, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 15 (1973) 175-178.			
T / K =	313.15		
P / bar =	UNKNOWN (1.0132)		
$h^M / \text{J.mol}^{-1}$	x_1		
228.00	0.1000		
445.00	0.2000		
632.00	0.3000		
773.00	0.4000		
856.00	0.5000		
866.00	0.6000		
794.00	0.7000		
630.00	0.8000		
368.00	0.9000		
Palmer, David A. - Smith, Buford D., Thermodynamic excess property measurements for acetonitrile-benzene-n-heptane system at 45°C, Journal of Chemical & Engineering Data. 17 (1972) 71-76. doi:10.1021/je60052a037			
T / K =	318.15		
P / bar =	UNKNOWN (1.0132)		
$h^M / \text{J.mol}^{-1}$	x_1		
201.39	0.0779		
364.67	0.1446		

-3.130	0.7294
-2.792	0.7924
-2.751	0.7940
-2.260	0.8591
-1.900	0.8873
-1.637	0.9123
-1.284	0.9317

Tanaka, Reiji, Excess heat capacities for mixture of benzene with n-heptane at 293.15, 298.15, and 303.15 K, Journal of Chemical & Engineering Data. 32 (1987) 176-177. doi:10.1021/je00048a014

T / K = 303.15

P / bar = UNKNOWN (1.0132)

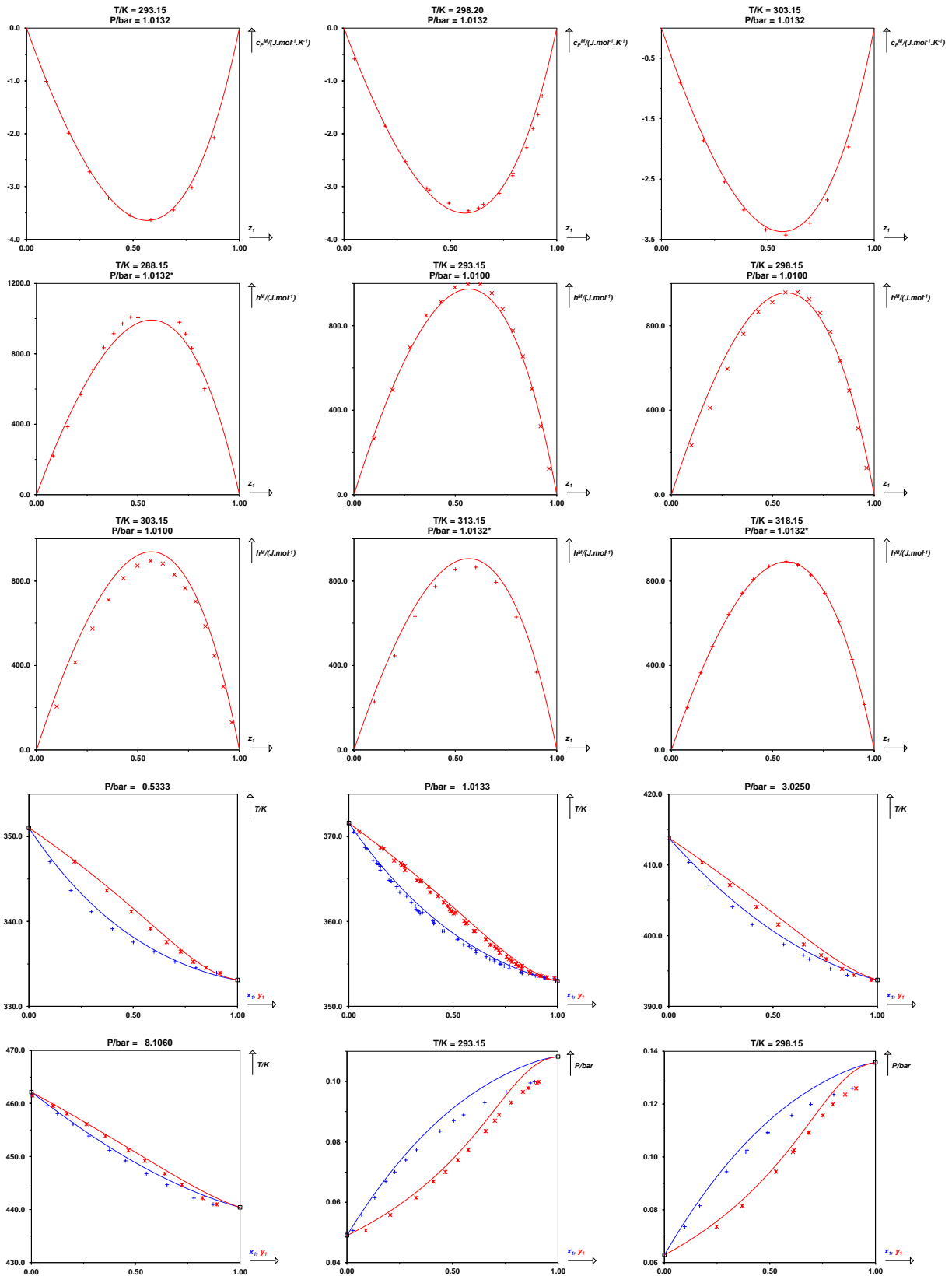
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.9010	0.0880
-1.864	0.1972
-2.547	0.2953
-3.012	0.3857
-3.340	0.4905
-3.428	0.5845
-3.232	0.6968
-2.846	0.7784
-1.971	0.8801

Critical point

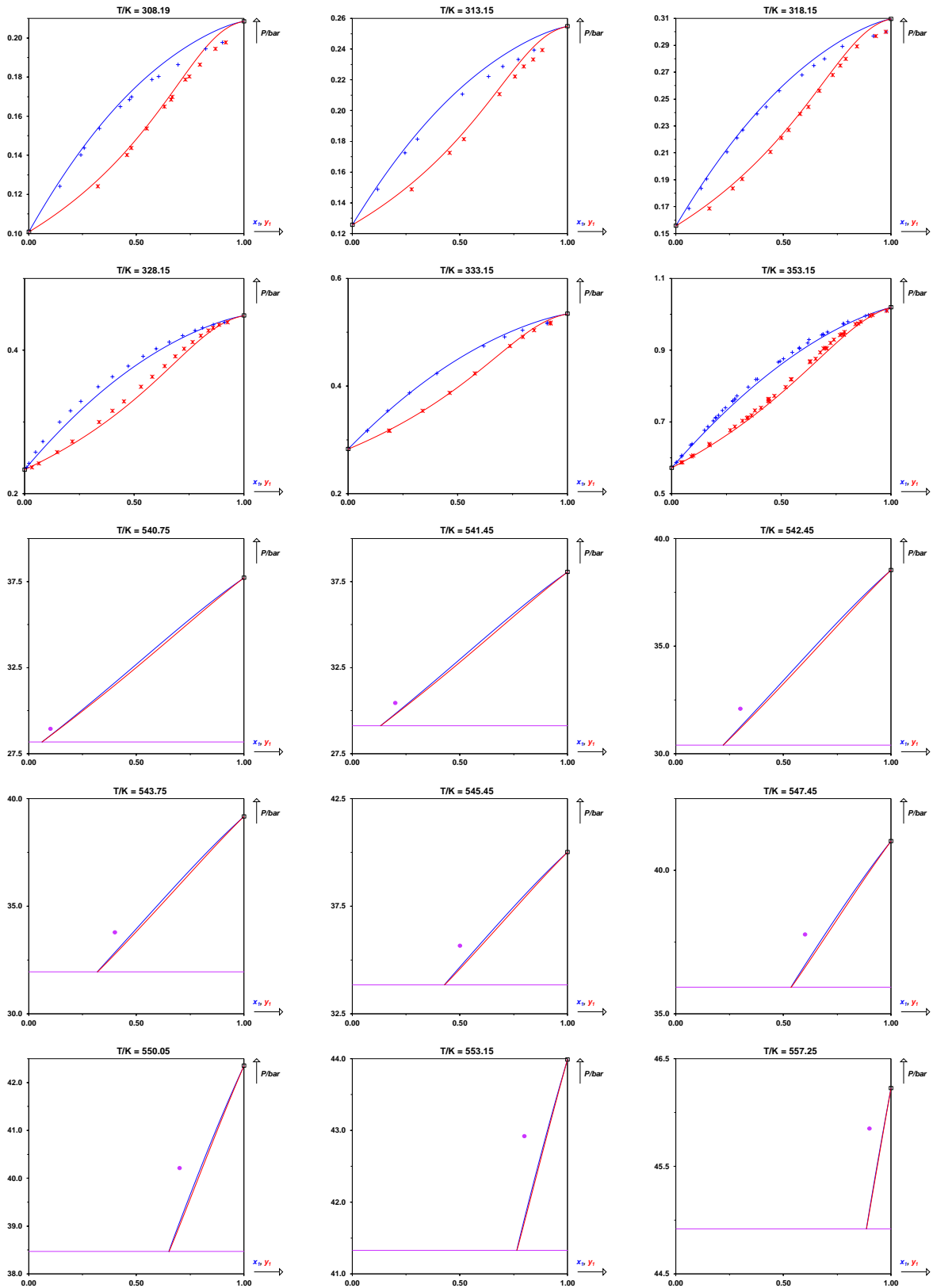
Kay, W.B. - Hissong, D., The critical properties of hydrocarbons. I. Simple mixtures, Proc. Am. Pet. Inst. Refin. Dep. 47 (1967) 653-722.

T / K	P / bar	x_1
540.75	28.94	0.1000
541.45	30.44	0.2000
542.45	32.08	0.3000
543.75	33.78	0.4000
545.45	35.66	0.5000
547.45	37.76	0.6000
550.05	40.21	0.7000
553.15	42.92	0.8000
557.25	45.85	0.9000

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



CYCLOHEXANE (1) + METHYLCYCLOHEXANE (2)

CAS	110-82-7	108-87-2
InChiKey	XDTMQSROBMDMFD-UHFFFAOYSA-N	UAEPNZWRGJTJPN-UHFFFAOYSA-N
T_c / K	553.80	572.10
P_c / bar	40.80	34.80
ω	0.208	0.236

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 4.820$

$B/\text{MPa} = -0.169$

Deviations

MAPE on $x = 22\%$

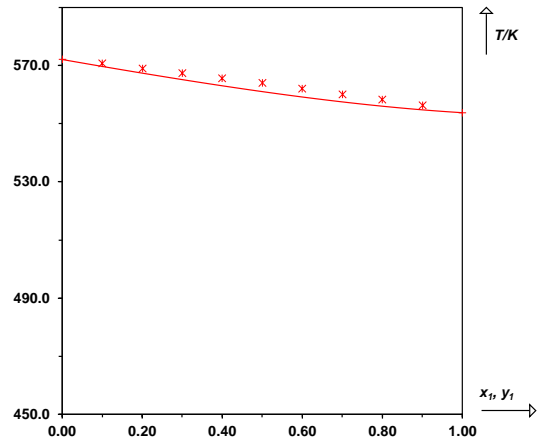
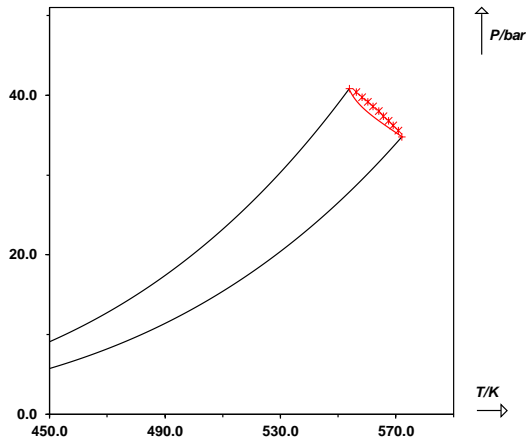
MAPE on $y = 23\%$

MAPE on $x_c = 33\%$

MAPE on $P_c = 2.6\%$

MAPE on $h^M = 54\%$

MAPE on $c_p^M = 142\%$



-----			356.30	0.8466	0.9077
Isothermal phase equilibrium data			355.80	0.8765	0.9263
-----			355.50	0.8977	0.9381
Benson, George C. - Benson, George C. - Anand, Subhash			355.10	0.9207	0.9528
C. - Kiyohara, Osamu, Thermodynamic properties of some			354.80	0.9369	0.9640
cycloalkane-cycloalkanol systems at 298. 15.deg.K. II,			354.50	0.9568	0.9752
Journal of Chemical & Engineering Data. 19 (1974) 258-			354.40	0.9658	0.9811
261. doi:10.1021/je60062a027			-----		
T / K = 308.15			Enthalpy of mixing		
-----			-----		
P / bar	x ₁	y ₁	Harsted, Bjarne Schroll - Thomsen, E. Sonnich, Excess		
0.1065	0.0814	0.1535	enthalpies from flow microcalorimetry 3. Excess		
0.1165	0.1767	0.3055	enthalpies for binary liquid mixtures of aliphatic and		
0.1258	0.2668	0.4263	aromatic hydrocarbons, carbon tetrachloride,		
0.1352	0.3587	0.5325	chlorobenzene, and carbon disulphide, The Journal of		
0.1445	0.4489	0.6235	Chemical Thermodynamics. 7 (1975) 369-376.		
0.1535	0.5371	0.7017	doi:10.1016/0021-9614(75)90175-5		
0.1596	0.5977	0.7503	T / K = 293.15		
0.1627	0.6283	0.7735	P / bar = UNKNOWN (1.0132)		
0.1706	0.7056	0.8285	h ^M / J.mol ⁻¹		
0.1803	0.8007	0.8898	x ₁		
0.1903	0.8995	0.9472	5.090		
0.1924	0.9197	0.9582	9.090		
0.1965	0.9596	0.9794	12.21		
-----			18.41		
Isobaric phase equilibrium data			18.77		
-----			15.76		
Zhang, X. - Zheng, Y. - Zhao, W., Measurement and			2.670		
correlation of vapor liquid equilibrium data for benzene			0.3600		
cyclohexane methyl cyclohexane DMF systems, Natural			0.4400		
Gas Chemical Industry. 22 (1997) 52-55.			0.3800		
P / bar = 1.013			0.8000		
-----			0.7900		
T / K	x ₁	y ₁	0.9900		
373.30	0.0256	0.0431	Ott, J.B. - Marsh, K.N. - Stokes, R.H., Excess enthalpies,		
371.70	0.0833	0.1351	excess Gibbs free energies, and excess volumes for		
370.90	0.1183	0.1962	(cyclohexane + n-hexane), and excess Gibbs free energies		
370.50	0.1398	0.2137	and excess volumes for (cyclohexane +		
369.00	0.2006	0.2966	methylcyclohexane) at 298.15 and 308.15 K, The Journal		
367.90	0.2420	0.3519	of Chemical Thermodynamics. 12 (1980) 1139-1148.		
367.20	0.2719	0.3918	doi:10.1016/S0021-9614(80)80006-1		
366.60	0.2975	0.4228	T / K = 298.15		
366.00	0.3286	0.4576	P / bar = UNKNOWN (1.0132)		
365.40	0.3580	0.4925	h ^M / J.mol ⁻¹		
364.90	0.3850	0.5195	x ₁		
362.80	0.4867	0.6209	3.530		
360.80	0.5825	0.7098	6.540		
359.60	0.6512	0.7689	11.20		
358.40	0.7190	0.8182	14.44		
357.90	0.7551	0.8432	16.73		
357.30	0.7874	0.8676	18.27		
356.80	0.8132	0.8839	19.41		

NA-NA systems (BAC = 1)

19.97	0.3484	22.35	0.5060
20.11	0.3842	21.97	0.5171
19.96	0.4161	21.87	0.5263
19.55	0.4505	21.59	0.5332
18.92	0.4810	21.23	0.5489
18.46	0.4996	20.97	0.5555
18.28	0.5069	20.69	0.5648
17.97	0.5167	20.32	0.5756
17.63	0.5274	20.07	0.5815
17.42	0.5328	19.37	0.5995
16.97	0.5459	18.14	0.6286
16.66	0.5551	16.66	0.6607
16.21	0.5657	15.20	0.6899
15.91	0.5753	13.49	0.7218
15.27	0.5869	11.54	0.7569
14.22	0.6097	9.390	0.7957
13.07	0.6339	7.530	0.8295
11.70	0.6615	5.560	0.8666
10.20	0.6907	3.570	0.9068
8.560	0.7227	1.660	0.9513
6.820	0.7578	0.7800	0.9751
4.920	0.7963		
3.410	0.8299		
2.040	0.8666		
0.8300	0.9072		
0.0300	0.9515		

Ott, J.B. - Marsh, K.N. - Stokes, R.H., Excess enthalpies, excess Gibbs free energies, and excess volumes for (cyclohexane + n-hexane), and excess Gibbs free energies and excess volumes for (cyclohexane + methylcyclohexane) at 298.15 and 308.15 K, The Journal of Chemical Thermodynamics. 12 (1980) 1139-1148. doi:10.1016/S0021-9614(80)80006-1

T / K = 308.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
3.640	0.0344
6.770	0.0664
11.78	0.1248
15.44	0.1764
18.10	0.2222
20.01	0.2629
21.58	0.3085
22.51	0.3488
22.98	0.3846
23.12	0.4165
23.02	0.4455
22.68	0.4765
22.30	0.4999

Heat capacity of mixing

Tamura, Katsutoshi, Excess heat capacities of the mixtures containing methylcyclohexane at 298.15 K, Fluid Phase Equilibria. 182 (2001) 303-312. doi:10.1016/S0378-3812(01)00407-1

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_P^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.0900	0.0500
-0.1800	0.1000
-0.2300	0.1500
-0.2800	0.2000
-0.2600	0.2500
-0.2300	0.3000
-0.1600	0.3500
-0.1200	0.4000
-0.0300	0.4500
0.0200	0.5000
0.0800	0.5500
0.1500	0.6000
0.2200	0.6500
0.2600	0.7000
0.2700	0.7500
0.2800	0.8000
0.2300	0.8500
0.1900	0.9000

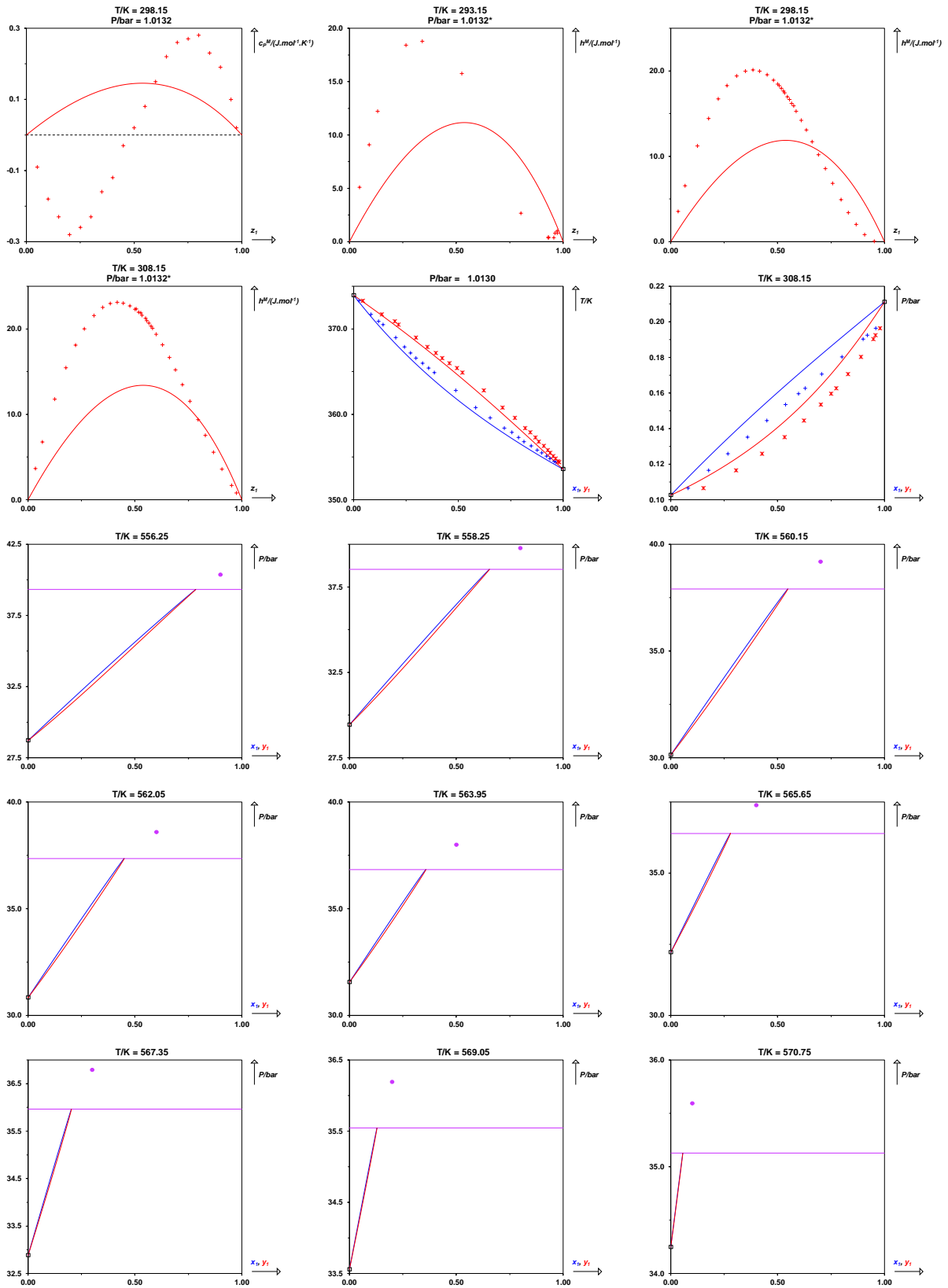
0.1000 0.9500
0.0200 0.9750

Critical point

Kay, W.B. - Hissong, D., The critical properties of hydrocarbons. I. Simple mixtures, Proc. Am. Pet. Inst. Refin. Dep. 47 (1967) 653-722.

T / K	P / bar	x ₁
556.25	40.36	0.9000
558.25	39.77	0.8000
560.15	39.18	0.7000
562.05	38.58	0.6000
563.95	37.98	0.5000
565.65	37.38	0.4000
567.35	36.79	0.3000
569.05	36.19	0.2000
570.75	35.59	0.1000

NA-NA systems (BAC = 1)



CYCLOHEXANE (1) + MONOCHLOROBENZENE (2)

CAS	110-82-7	108-90-7
InChiKey	XDTMQSROBMDMFD-UHFFFAOYSA-N	MVPPADPHJFYWMZ-UHFFFAOYSA-N
T_c / K	553.80	632.35
P_c / bar	40.80	45.19
ω	0.208	0.250

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 30.99$

$B/\text{MPa} = 47.91$

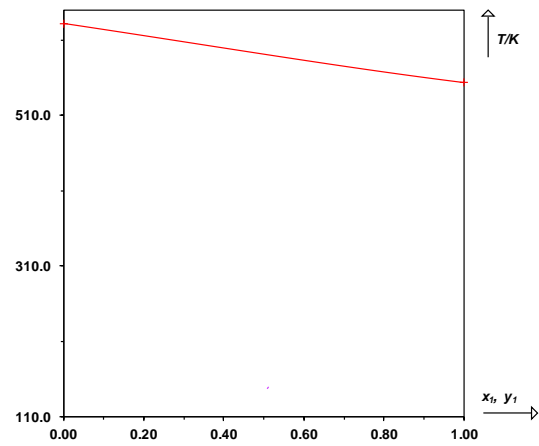
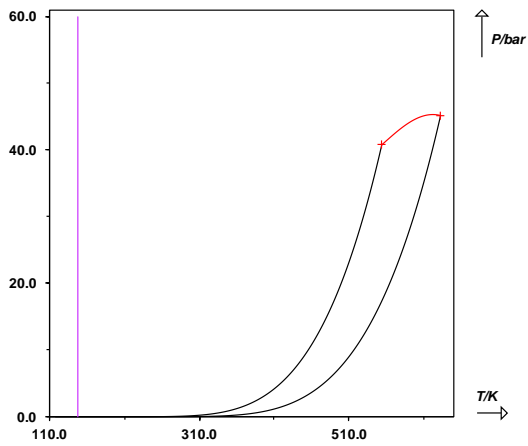
Deviations

MAPE on $x = 6.4\%$

MAPE on $y = 4.9\%$

MAPE on $h^M = 7.8\%$

MAPE on $c_p^M = 6.7\%$



-----			344.95	0.2770	0.6900
Isothermal phase equilibrium data			340.55	0.3760	0.7730
-----			337.25	0.4570	0.8260
Díaz Peña, M. - Compostizo, A. - Crespo Colín, A. - Escudero, I., Activity coefficients and excess Gibbs free energies at 348.15 K in cyclohexane+chlorobenzene, +fluorobenzene, and +thiophene, The Journal of Chemical Thermodynamics. 12 (1980) 1051-1055. doi:10.1016/0021-9614(80)90160-3			334.35	0.5600	0.8690
T / K = 348.15			330.35	0.6660	0.9230
P / bar	x ₁	y ₁	328.70	0.7800	0.9440
0.2266	0.0566	0.3170	328.10	0.8260	0.9530
0.2300	0.0597	0.3285	326.65	0.9190	0.9790
0.2414	0.0709	0.3669	-----		
0.2731	0.1048	0.4578	Enthalpy of mixing		
0.2931	0.1267	0.5046	-----		
0.3169	0.1544	0.5538	Harsted, Bjarne Schroll - Thomsen, E. Sonnich, Excess enthalpies from flow microcalorimetry 3. Excess enthalpies for binary liquid mixtures of aliphatic and aromatic hydrocarbons, carbon tetrachloride, chlorobenzene, and carbon disulphide, The Journal of Chemical Thermodynamics. 7 (1975) 369-376. doi:10.1016/0021-9614(75)90175-5		
0.3400	0.1829	0.5956	T / K = 293.15		
0.3732	0.2247	0.6469	P / bar = UNKNOWN (1.0132)		
0.3939	0.2517	0.6750	h ^M / J.mol ⁻¹	x ₁	
0.4358	0.3089	0.7242	183.50	0.0825	
0.4601	0.3430	0.7492	179.30	0.0826	
0.4883	0.3838	0.7755	381.80	0.1843	
0.5189	0.4292	0.8013	694.50	0.4862	
0.5359	0.4555	0.8146	697.20	0.4978	
0.5607	0.4945	0.8330	504.90	0.7939	
0.5785	0.5237	0.8455	292.30	0.8994	
0.5964	0.5533	0.8575	Tanaka, Reiji - Murakami, Sachio - Fujishiro, Ryoichi, Excess enthalpies of mixing of a polar liquid + a non-polar liquid at 298.15 K, The Journal of Chemical Thermodynamics. 6 (1974) 209-218. doi:10.1016/0021-9614(74)90172-4		
0.6267	0.6061	0.8767	T / K = 298.15		
0.6435	0.6354	0.8867	P / bar = UNKNOWN (1.0132)		
0.6699	0.6831	0.9025	h ^M / J.mol ⁻¹	x ₁	
0.6901	0.7199	0.9138	84.75	0.0339	
0.7187	0.7718	0.9305	191.76	0.0803	
0.7303	0.7925	0.9364	298.35	0.1326	
0.7553	0.8379	0.9502	395.11	0.1869	
0.7767	0.8758	0.9620	475.00	0.2368	
0.8186	0.9487	0.9836	557.66	0.2982	
-----			618.26	0.3550	
Isobaric phase equilibrium data			662.83	0.4099	
-----			689.69	0.4706	
Rolemberg, Marlus P. - Krähenbühl, Maria Alvina, Vapor-Liquid Equilibria of Binary and Ternary Mixtures of Benzene, Cyclohexane, and Chlorobenzene at 40.0 kPa and 101.3 kPa, Journal of Chemical & Engineering Data. 46 (2001) 256-260. doi:10.1021/je000059I			696.73	0.4890	
P / bar = 0.4000			699.64	0.4933	
T / K	x ₁	y ₁	702.03	0.5363	
369.25	0.0210	0.1600	692.97	0.5886	
362.45	0.0600	0.3510			
348.25	0.2280	0.6400			

NA-NA systems (BAC = 1)

668.07	0.6424	591.00	0.3876
623.43	0.6988	649.00	0.5071
599.73	0.7539	632.00	0.6173
477.91	0.8079	528.00	0.7155
382.82	0.8579	385.00	0.8170
292.84	0.8976	196.00	0.9192
177.13	0.9419		

Amaya, Kazuo, Thermodynamical Studies on Binary Systems Consisting of Polar and Non-polar Liquids. II. The Measurement of the Heats of Mixing for Binary Systems of Polar and Non-polar Liquids, Bulletin of the Chemical Society of Japan. 34 (1961) 1278-1285. doi:10.1246/bcsj.34.1278

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
274.10	0.1270
538.90	0.2920
679.60	0.4940
584.30	0.7120
292.30	0.8890

Anantaraman, A. V. - Bhattacharyya, S. N. - Palit, S. R., Weak dipolar interaction in solutions. Systems: cyclohexane+chlorobenzene and carbon tetrachloride+chlorobenzene, Transactions of the Faraday Society. 57 (1961) doi:10.1039/TF9615700040

T / K = 308.65

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
185.00	0.0969
361.00	0.1945
482.00	0.2928
609.00	0.3917
670.00	0.4913
667.00	0.5916
572.00	0.6924
434.00	0.7944
253.00	0.8968

Anantaraman, A. V. - Bhattacharyya, S. N. - Palit, S. R., Weak dipolar interaction in solutions. Systems: cyclohexane+chlorobenzene and carbon tetrachloride+chlorobenzene, Transactions of the Faraday Society. 57 (1961) doi:10.1039/TF9615700040

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
213.00	0.1209
348.00	0.2068
446.00	0.2785

Anantaraman, A. V. - Bhattacharyya, S. N. - Palit, S. R., Weak dipolar interaction in solutions. Systems: cyclohexane+chlorobenzene and carbon tetrachloride+chlorobenzene, Transactions of the Faraday Society. 57 (1961) doi:10.1039/TF9615700040

T / K = 328.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
125.00	0.0827
289.00	0.1866
460.00	0.3083
552.00	0.3744
607.00	0.4755
624.00	0.5837
549.00	0.6998
442.00	0.7735
272.00	0.8768

Heat capacity of mixing

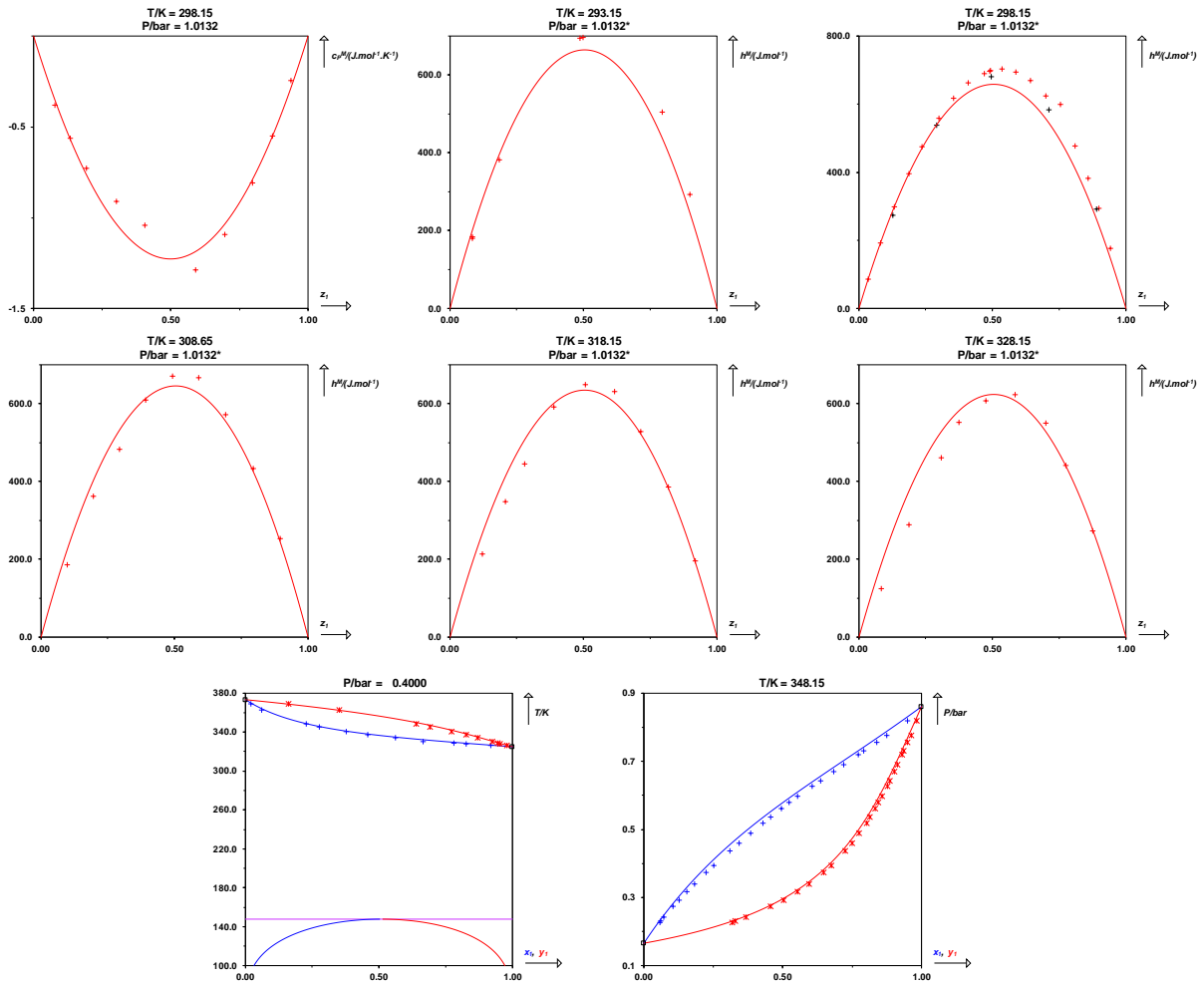
Bendiab, H. - Roux-Desgranges, G. - Roux, A. H. - Grolier, J. -P. E. - Patterson, D., Excess heat capacities of ternary systems containing chlorobenzene or chloronaphthalene, Journal of Solution Chemistry. 23 (1994) 307-323. doi:10.1007/BF00973552

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$cp^M / \text{J.mol}^{-1} \cdot \text{K}^{-1}$	x_1
-0.3800	0.0785
-0.5640	0.1333
-0.7270	0.1925
-0.9100	0.3008
-1.043	0.4044
-1.290	0.5893
-1.094	0.6960
-0.8090	0.7963
-0.5490	0.8708
-0.2470	0.9384

NA-NA systems (BAC = 1)



n-HEXANE (1) + CYCLOHEXANE (2)

CAS	110-54-3	110-82-7
InChiKey	VLKZOEYAKHREP-UHFFFAOYSA-N	XDTMQSROBMDMFD-UHFFFAOYSA-N
T_c / K	507.60	553.80
P_c / bar	30.25	40.80
ω	0.301	0.208

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 5.601

B/MPa = 15.64

Deviations

MAPE on x = 11 %

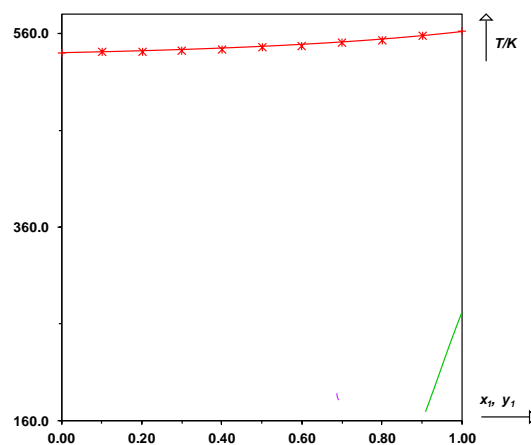
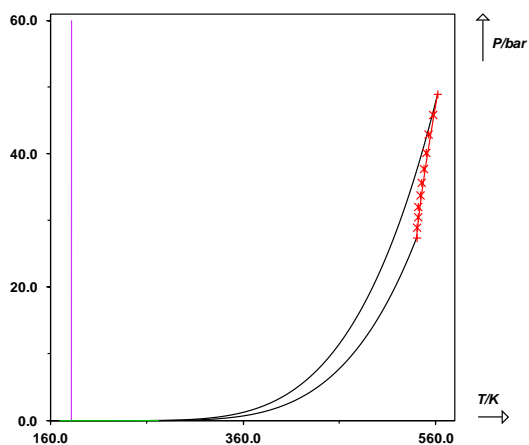
MAPE on y = 13 %

MAPE on x_c = 2.2 %

MAPE on P_c = 0.26 %

MAPE on h^M = 7.6 %

MAPE on c_p^M = 9.7 %



Isothermal phase equilibrium data			0.2454	0.3673	0.4713
-----			0.2542	0.4513	0.5538
-----			0.2547	0.4559	0.5582
Martin, MI - Youings, Jc, Vapour pressures and excess Gibbs free energies of cyclohexane + n-hexane, + n-heptane and + n-octane at 298. 15 K, Australian Journal of Chemistry. 33 (1980) doi:10.1071/CH9802133			0.2634	0.5432	0.6384
T / K =	298.15		0.2637	0.5460	0.6409
P / bar	x ₁	y ₁	0.2724	0.6361	0.7189
0.1320	0.0180	0.0330	0.2812	0.7286	0.7947
0.1339	0.0361	0.0635	0.2895	0.8197	0.8661
0.1355	0.0531	0.0905	0.2985	0.9194	0.9412
0.1371	0.0695	0.1159	Susarev, M.P. - Chen, S.T., Calculation of vapor-liquid equilibrium in ternary systems from the data on binary systems. The system benzene-n-hexane-cyclohexane, Russ. J. Phys. Chem. 37 (1963) 938-943.		
0.1382	0.0811	0.1332	T / K = 343.15		
0.1394	0.0944	0.1523	P / bar	x ₁	y ₁
0.1434	0.1397	0.2152	0.7733	0.1250	0.1790
0.1480	0.1946	0.2853	0.8161	0.2500	0.3360
0.1517	0.2406	0.3400	0.8567	0.3750	0.4650
0.1550	0.2824	0.3872	0.9003	0.5000	0.5900
0.1578	0.3197	0.4276	0.9402	0.6250	0.7080
0.1603	0.3527	0.4620	0.9797	0.7420	0.8060
0.1625	0.3830	0.4924	1.008	0.8750	0.9010
0.1631	0.3951	0.5037	-----		
0.1639	0.4031	0.5122	Isobaric phase equilibrium data		
0.1642	0.4109	0.5190	-----		
0.1664	0.4405	0.5476	Ridgway, Kenneth - Butler, Paul Alexander, Physical properties of the ternary system benzene-cyclohexane-hexane, Journal of Chemical & Engineering Data. 12 (1967) 509-515. doi:10.1021/je60035a012		
0.1681	0.4661	0.5716	P / bar = 1.013		
0.1702	0.4959	0.5989	T / K	x ₁	y ₁
0.1724	0.5294	0.6289	352.65	0.0820	0.1210
0.1749	0.5672	0.6622	352.15	0.1210	0.1670
0.1777	0.6089	0.6981	351.35	0.1670	0.2260
0.1809	0.6591	0.7401	350.50	0.2260	0.3000
0.1837	0.7039	0.7769	349.90	0.2700	0.3530
0.1872	0.7585	0.8205	349.55	0.3000	0.3840
0.1912	0.8243	0.8712	348.85	0.3530	0.4380
0.1946	0.8793	0.9123	348.55	0.3840	0.4680
0.1958	0.8987	0.9266	347.85	0.4380	0.5230
0.1970	0.9187	0.9411	346.85	0.5230	0.6020
Benson, George C. - Benson, George C. - Anand, Subhash C. - Kiyohara, Osamu, Thermodynamic properties of some cycloalkane-cycloalkanol systems at 298. 15.deg.K. II, Journal of Chemical & Engineering Data. 19 (1974) 258-261. doi:10.1021/je60062a027			346.05	0.5910	0.6710
T / K =	308.15		345.20	0.6710	0.7400
P / bar	x ₁	y ₁	344.55	0.7400	0.7920
0.2121	0.0823	0.1306	344.00	0.7970	0.8400
0.2240	0.1762	0.2571	343.55	0.8400	0.8770
0.2240	0.1763	0.2574	343.20	0.8770	0.9040
0.2351	0.2724	0.3705			
0.2359	0.2780	0.3769			

NA-NA systems (BAC = 1)

Myers, H.S., [Vapor-liquid] equilibrium for naphthenes and paraffins, Pet. Refiner. 36 (1957) 175-178.			214.80	0.2660
P / bar = 1.013			231.30	0.3130
T / K	x_1	y_1	240.10	0.3610
353.75	0.0080	0.0180	241.60	0.4590
353.50	0.0190	0.0320	237.00	0.5090
353.15	0.0450	0.0700	226.40	0.5600
352.90	0.0630	0.0975	190.60	0.6640
352.45	0.0935	0.1350		
351.80	0.1330	0.1870	Ewing, M.B - Marsh, K.N, The enthalpy of mixing of n-hexane + cyclohexane at 288.15 and 318.15 K, The Journal of Chemical Thermodynamics. 2 (1970) 295-296. doi:10.1016/0021-9614(70)90094-7	
351.15	0.1815	0.2470	T / K = 288.15	
350.30	0.2385	0.3160	P / bar = UNKNOWN (1.0132)	
349.65	0.2870	0.3730	$h^M / J.mol^{-1}$	x_1
349.20	0.3180	0.4000	9.170	0.0071
348.50	0.3690	0.4575	25.15	0.0199
347.95	0.4145	0.5050	49.39	0.0406
347.65	0.4425	0.5335	89.88	0.0793
347.40	0.4620	0.5530	121.91	0.1150
346.90	0.4980	0.5835	147.30	0.1482
346.75	0.5155	0.5995	167.34	0.1787
346.55	0.5355	0.6175	183.28	0.2073
346.40	0.5490	0.6300	195.96	0.2339
345.90	0.5955	0.6730	210.17	0.2707
345.25	0.6545	0.7240	220.06	0.3040
344.85	0.6925	0.7575	226.75	0.3345
344.55	0.7240	0.7860	231.07	0.3624
344.10	0.7570	0.8080	234.05	0.3962
344.05	0.7685	0.8180	234.85	0.4265
343.95	0.7770	0.8295	233.85	0.4515
343.70	0.8070	0.8520	233.47	0.4518
343.50	0.8310	0.8715	234.03	0.4540
343.30	0.8500	0.8830	231.67	0.4791
343.10	0.8735	0.9020	231.46	0.4794
342.90	0.9000	0.9260	227.79	0.5106
342.50	0.9350	0.9500	227.66	0.5109
342.20	0.9690	0.9760	221.54	0.5462
-----			221.35	0.5466
Enthalpy of mixing			214.73	0.5766
-----			214.50	0.5767
Siddiqi, M.A. - Lucas, K., An isothermal high-pressure flow calorimeter the excess enthalpy of (cyclohexane + n-hexane) at different pressures at 288.15, 298.15, and 313.15 K, The Journal of Chemical Thermodynamics. 14 (1982) 1183-1190. doi:10.1016/0021-9614(82)90042-8			205.51	0.6104
T / K = 288.15			205.24	0.6107
P / bar = 150.00			193.21	0.6484
$h^M / J.mol^{-1}$	z_1		192.98	0.6487
170.20	0.1750		176.96	0.6915
194.00	0.2200		176.79	0.6917
			163.32	0.7235
			163.23	0.7238
			147.03	0.7587

NA-NA systems (BAC = 1)

146.96	0.7589	195.11	0.2486
127.42	0.7974	195.55	0.2506
127.36	0.7976	198.52	0.2585
103.79	0.8404	210.09	0.2992
103.85	0.8405	213.11	0.3045
75.21	0.8882	217.03	0.3233
75.28	0.8883	219.52	0.3386
40.50	0.9418	220.16	0.3411
40.69	0.9418	220.72	0.3477
20.63	0.9711	221.67	0.3516
20.46	0.9711	225.98	0.3818
7.340	0.9898	225.30	0.3995
7.140	0.9898	227.11	0.4314

Siddiqi, M.A. - Lucas, K., An isothermal high-pressure flow calorimeter the excess enthalpy of (cyclohexane + n-hexane) at different pressures at 288.15, 298.15, and 313.15 K, The Journal of Chemical Thermodynamics. 14 (1982) 1183-1190. doi:10.1016/0021-9614(82)90042-8

T / K = 298.15

P / bar = 150.00

$h^M / \text{J.mol}^{-1}$

z_1

160.30	0.1750
185.50	0.2200
203.50	0.2660
226.10	0.3610
230.10	0.4090
230.40	0.4590
215.80	0.5600
211.80	0.5730
201.00	0.6110
165.20	0.7180

Christensen, J.J. - Izatt, R.M. - Eatough, D.J. - Hansen, L.D., The effect of pressure on the excess enthalpies of cyclohexane + n-hexane at 298.15 K, The Journal of Chemical Thermodynamics. 10 (1978) 25-34. doi:10.1016/0021-9614(78)90145-3

T / K = 298.15

P / bar = 69.81

$h^M / \text{J.mol}^{-1}$

z_1

90.23	0.0829
115.15	0.1117
124.59	0.1255
146.59	0.1553
151.83	0.1629
150.72	0.1630
154.65	0.1690
176.62	0.2063
178.62	0.2133
190.74	0.2360

226.00	0.4354
225.30	0.4485
221.27	0.4985
217.73	0.5268
218.24	0.5293
213.50	0.5495
207.14	0.5782
200.84	0.6016
192.25	0.6316
191.94	0.6346
190.88	0.6355
184.66	0.6549
173.90	0.6812
163.82	0.7093
148.66	0.7414
148.75	0.7424
148.79	0.7437
148.71	0.7453
139.65	0.7649
111.30	0.8217
78.16	0.8798

Heintz, A. - Lichtenthaler, R. N., An Isothermal Flow Calorimeter for Pressures to 600 bar, Berichte der Bunsengesellschaft für physikalische Chemie. 83 (1979) 853-856. doi:10.1002/bbpc.19790830816

T / K = 298.15

P / bar = 150.00

$h^M / \text{J.mol}^{-1}$

z_1

136.80	0.1430
158.70	0.1690
182.00	0.2130
230.00	0.4530
204.90	0.6080
160.90	0.7140

Siddiqi, M.A. - Lucas, K., An isothermal high-pressure flow calorimeter the excess enthalpy of (cyclohexane + n-hexane) at different pressures at 288.15, 298.15, and 313.15 K, The Journal of Chemical Thermodynamics. 14 (1982) 1183-1190. doi:10.1016/0021-9614(82)90042-8

T / K = 313.15

P / bar = 150.00

$h^M / \text{J.mol}^{-1}$ z_1

140.50 0.1750

164.10 0.2200

182.20 0.2660

196.20 0.3130

205.20 0.3610

213.50 0.4590

209.70 0.5090

202.00 0.5600

190.80 0.6110

175.10 0.6640

154.90 0.7180

Siddiqi, M.A. - Lucas, K., An isothermal high-pressure flow calorimeter the excess enthalpy of (cyclohexane + n-hexane) at different pressures at 288.15, 298.15, and 313.15 K, The Journal of Chemical Thermodynamics. 14 (1982) 1183-1190. doi:10.1016/0021-9614(82)90042-8

T / K = 313.15

P / bar = 1.0000

$h^M / \text{J.mol}^{-1}$ z_1

149.80 0.7180

169.30 0.6640

183.00 0.6110

194.80 0.5600

202.50 0.5090

206.00 0.4590

200.30 0.3610

190.60 0.3130

177.70 0.2660

158.30 0.2200

136.90 0.1750

Gmehling, J. - Meents, B., Excess enthalpy. Cyclohexane-hexane system, Int. Data Ser. Sel. Data Mixtures Ser. A. (1992)

T / K = 332.65

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1

16.19 0.0186

40.28 0.0468

73.05 0.0944

105.27 0.1430

128.67 0.1925

145.16 0.2429

160.47 0.2944

164.89 0.3468

173.92 0.4003

172.90 0.4548

172.78 0.4548

171.13 0.4548

171.25 0.5105

159.41 0.5673

151.35 0.6253

133.41 0.6845

115.82 0.7449

95.42 0.8066

62.94 0.8697

36.96 0.9341

18.17 0.9735

Gmehling, J. - Krentscher, B., Excess enthalpies of 12 binary liquid mixtures containing cyclohexane at elevated temperatures and pressures (up to 416 K and 1.9 MPa), ELDDATA Int. Electron. J. Phys.-Chem. Data. 1 (1995) 181-190.

T / K = 413.21

P / bar = 11.34

$h^M / \text{J.mol}^{-1}$ z_1

33.01 0.0846

56.67 0.1721

72.17 0.2627

80.68 0.3566

80.90 0.4540

77.08 0.5550

65.89 0.6599

47.97 0.7688

24.84 0.8821

Heat capacity of mixing

Saito, Akemi - Tanaka, Reiji, Excess volumes and heat capacities of binary mixtures formed from cyclohexane, hexane, and heptane at 298.15 K, The Journal of Chemical Thermodynamics. 20 (1988) 859-865. doi:10.1016/0021-9614(88)90075-4

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$cp^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

-0.2730 0.0394

-0.4550 0.0686

-0.4700 0.0712

-0.7320 0.1194

-0.9250 0.1627

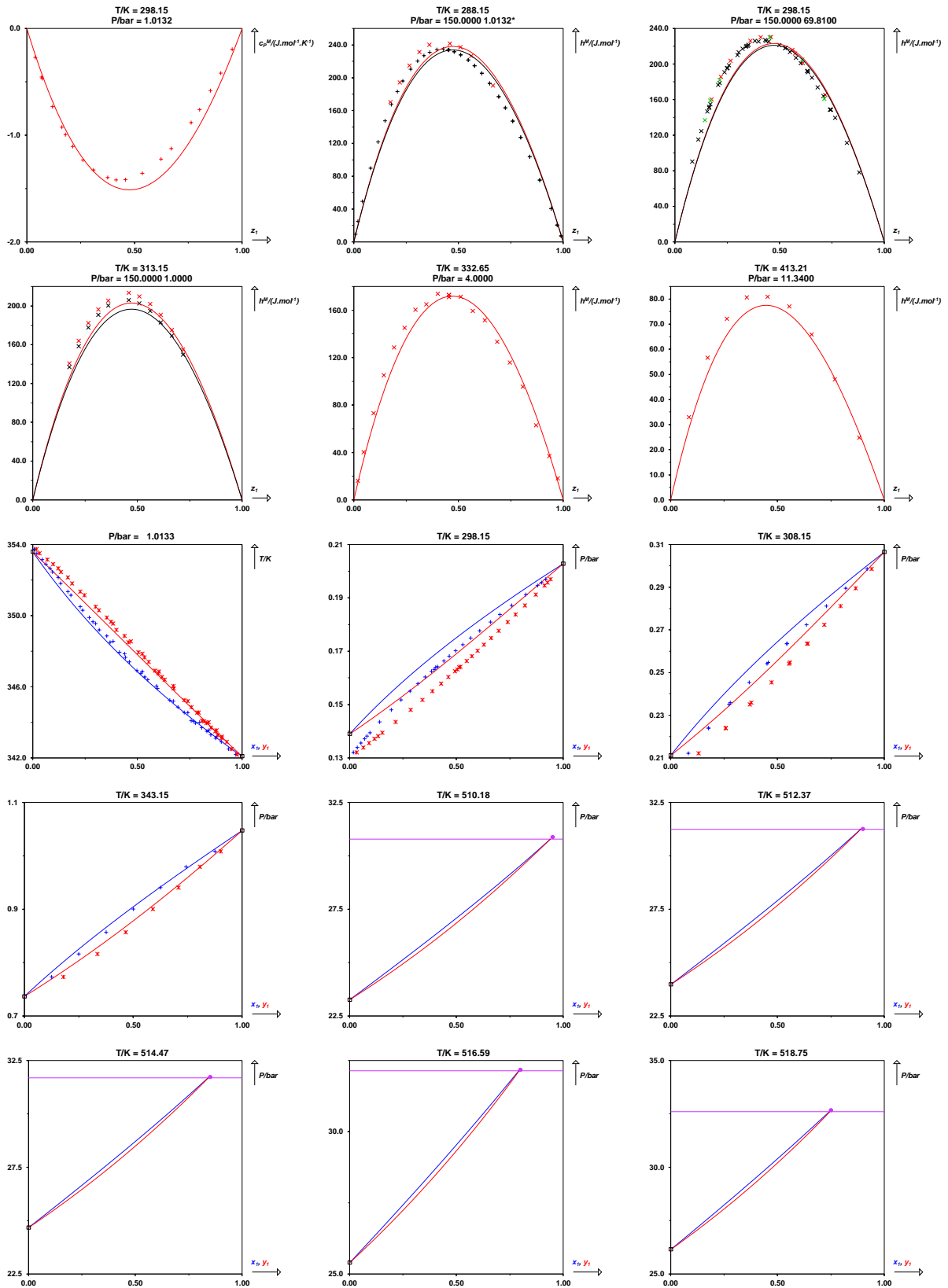
-0.9960	0.1792
-1.106	0.2129
-1.234	0.2600
-1.326	0.3093
-1.397	0.3757
-1.419	0.4145
-1.417	0.4573
-1.356	0.5367
-1.225	0.6228
-1.127	0.6701
-0.8830	0.7638
-0.7600	0.8027
-0.5830	0.8535
-0.4180	0.9006
-0.1950	0.9533

Critical point

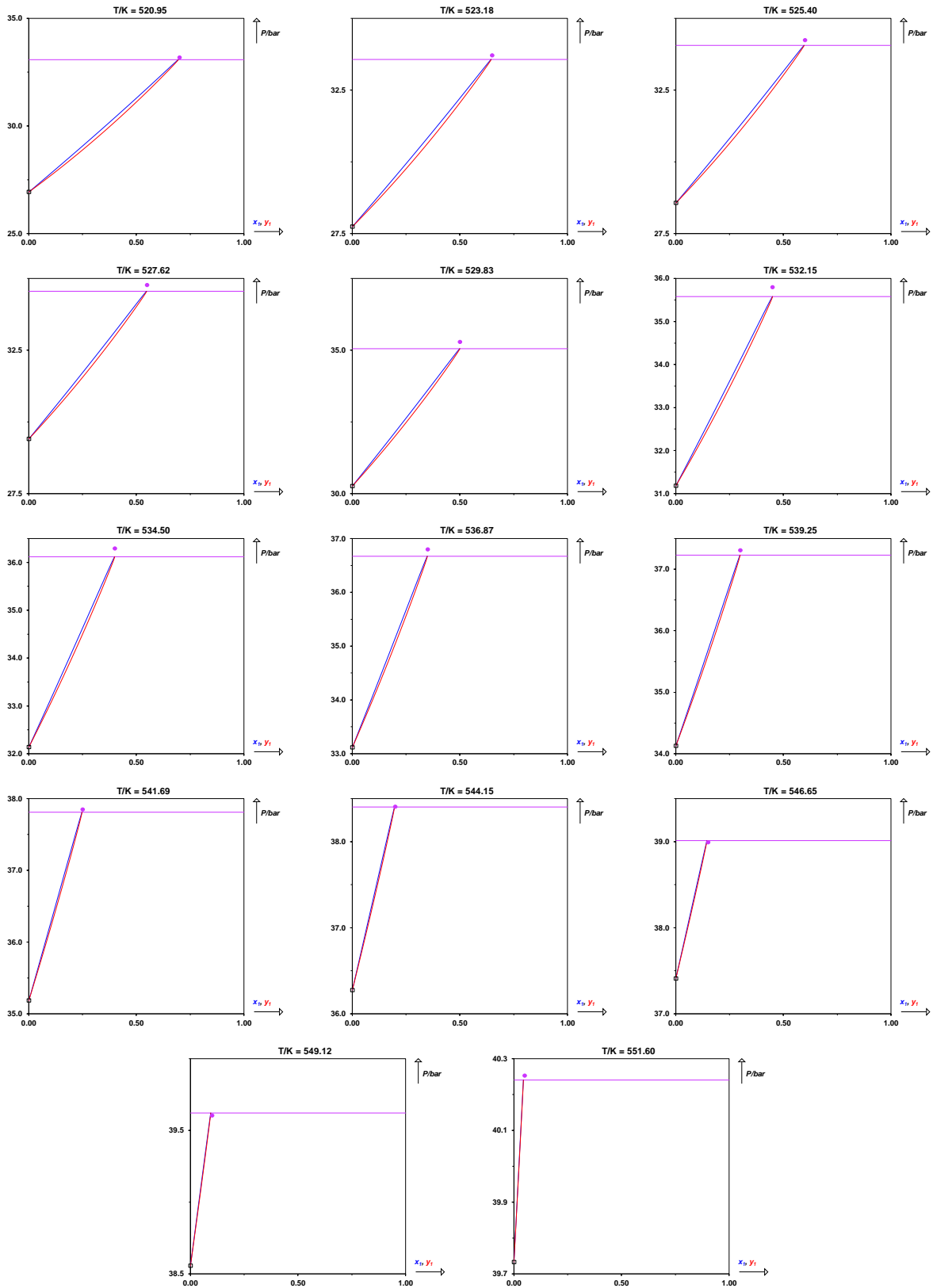
Hissong, D.W. - Kay, W.B., Critical properties of hydrocarbons. II. Correlational studies, Proc. Am. Pet. Inst. Refin. Dep. 48 (1968) 397-463.

T / K	P / bar	x_1
510.18	30.88	0.9500
512.37	31.25	0.9000
514.47	31.72	0.8500
516.59	32.17	0.8000
518.75	32.66	0.7500
520.95	33.17	0.7000
523.18	33.70	0.6500
525.40	34.24	0.6000
527.62	34.76	0.5500
529.83	35.28	0.5000
532.15	35.79	0.4500
534.50	36.29	0.4000
536.87	36.80	0.3500
539.25	37.31	0.3000
541.69	37.85	0.2500
544.15	38.40	0.2000
546.65	38.99	0.1500
549.12	39.60	0.1000
551.60	40.25	0.0500

NA-NA systems (BAC = 1)



NA-NA systems (BAC = 1)



1,2-DICHLOROETHANE (1) + TOLUENE (2)

CAS	107-06-2	108-88-3
InChiKey	WSLDOOZREJYCGB-UHFFFAOYSA-N	YXFVVABEGXRONW-UHFFFAOYSA-N
T_c / K	561.60	591.75
P_c / bar	53.70	41.08
ω	0.287	0.264

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 41.17$

$B/\text{MPa} = -12.16$

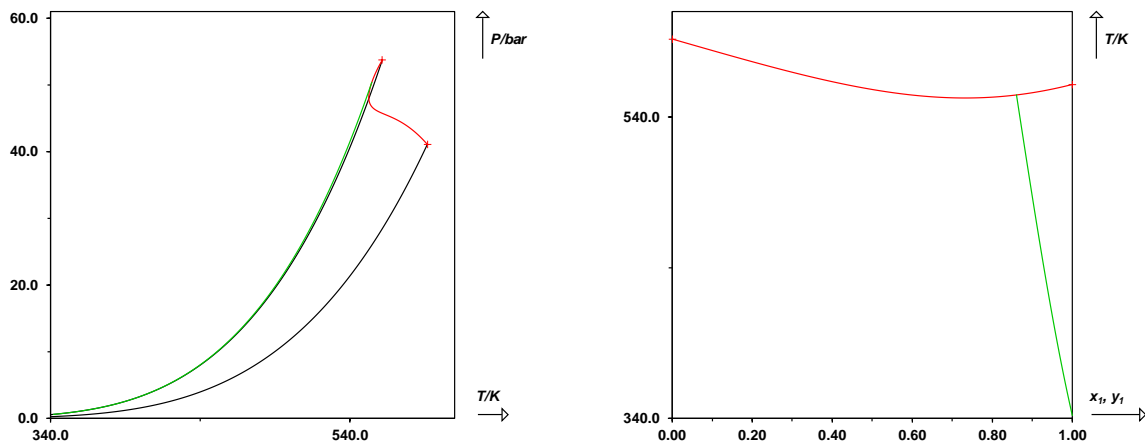
Deviations

MAPE on $x = 35\%$

MAPE on $y = 35\%$

MAPE on $h^M = 70\%$

MAPE on $c_p^M = 123\%$



Isobaric phase equilibrium data

Ellis, S.R.M. - Contractor, R.M., Vapor-liquid equilibria at reduced pressure, Chem. Eng. London. 15 (1964) 10-13.

P / bar =	0.2666	
T / K	x ₁	y ₁
338.85	0.1100	0.2250
335.55	0.2150	0.3930
332.65	0.3250	0.5330
330.55	0.4040	0.6210
330.30	0.4165	0.6375
326.95	0.5630	0.7600
323.55	0.7270	0.8700
321.55	0.8440	0.9315

Rollet, A.P. - Toledano, P. - Elkaim, G. - Sonez, M., Ebulliometry of volatile solutes. II, Publ. Sci. Univ. Alger Ser. B. 2 (1956) 403-425.

P / bar =	1.013	
T / K	x ₁	y ₁
381.67	0.0500	0.1046
379.66	0.1000	0.1999
375.89	0.2000	0.3645
372.47	0.3000	0.4991
369.40	0.4000	0.6092
366.67	0.5000	0.7000
364.24	0.6000	0.7762
362.06	0.7000	0.8414
360.08	0.8000	0.8988
358.28	0.9000	0.9509
357.43	0.9500	0.9757

Enthalpy of mixing

Baud, E., Thermal analysis of binary mixtures, Bull. Soc. Chim. Fr. 17 (1915) 329-345.

T / K =	290.65	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-42.71	0.0790	
-78.29	0.2620	
-66.15	0.3850	
-25.12	0.5370	
-2.554	0.6180	
31.40	0.8030	
18.42	0.9440	

Tschamler, H., Über binäre flüssige Mischungen VI: Mischungswärmen, Molwärmen, Volumeffekte und

Zustands-diagramme von 1,2-Dichloräthan mit Benzol und n-Alkylbenzolen, Monatshefte für Chemie. 79 (1948) 499-507. doi:10.1007/BF00898687

T / K =	295.40	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-54.43	0.1000	
-83.74	0.2000	
-87.92	0.3000	
-66.99	0.4000	
-39.78	0.5000	
-10.47	0.6000	
20.93	0.7000	
37.68	0.8000	
35.59	0.9000	

 Ortega, J. - Placido, J., Excess enthalpies of 12 binary liquid mixtures of α,ω-dichloroalkanes (C₂, C₄, C₆) + benzene, toluene, ethylbenzene, or butylbenzene at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 2 (1996) 111-120.

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-39.40	0.0698	
-69.20	0.1469	
-94.90	0.2230	
-113.20	0.2973	
-122.90	0.3664	
-123.20	0.4284	
-102.10	0.5260	
-84.80	0.5677	
-66.40	0.6117	
-48.10	0.6593	
-31.50	0.7060	
-16.60	0.7554	
-3.600	0.8091	
4.200	0.8583	
6.300	0.9108	
3.300	0.9585	

Heat capacity of mixing

Tschamler, H., Über binäre flüssige Mischungen VI: Mischungswärmen, Molwärmen, Volumeffekte und Zustands-diagramme von 1,2-Dichloräthan mit Benzol und n-Alkylbenzolen, Monatshefte für Chemie. 79 (1948) 499-507. doi:10.1007/BF00898687

T / K =	295.15	
P / bar =	UNKNOWN (1.0132)	

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-2.256	0.1000
-2.652	0.2000
-1.934	0.3000
-1.664	0.4000
-1.051	0.5000
0.3167	0.6000
1.644	0.7000
2.523	0.8000
2.122	0.9000

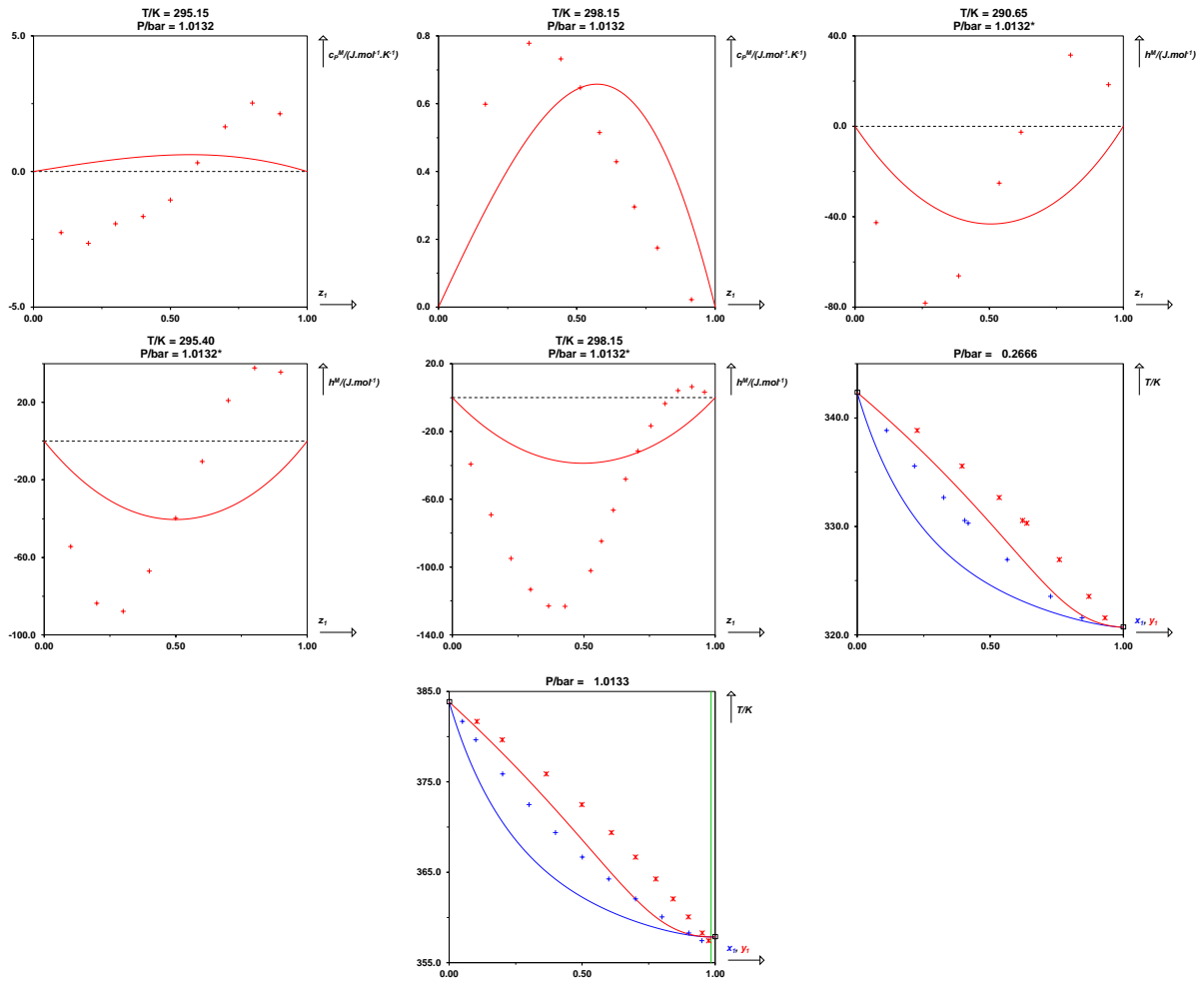
Wilhelm, Emmerich - Grolier, J.-P. E. - Ghassemi, M. H. Karbalai, Molar Heat Capacities of Binary Liquid Mixtures: 1,2-Dichlorethane + Benzene, + Toluene, and + p-Xylene, Berichte der Bunsengesellschaft für physikalische Chemie. 81 (1977) 925-930.
doi:10.1002/bbpc.19770811009

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
0.5980	0.1687
0.7780	0.3275
0.7320	0.4417
0.6470	0.5130
0.5150	0.5816
0.4290	0.6433
0.2960	0.7079
0.1740	0.7915
0.0220	0.9144

NA-NA systems (BAC = 1)



1,2-DICHLOROETHANE (1) + CARBON TETRACHLORIDE (2)

CAS	107-06-2	56-23-5
InChiKey	WSLDOOZREJYCGB-UHFFFAOYSA-N	VZGDMQKNWNREIO-UHFFFAOYSA-N
T_c / K	561.60	556.35
P_c / bar	53.70	45.60
ω	0.287	0.193

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 45.55$

$B/\text{MPa} = 56.68$

Deviations

MAPE on $x = 15\%$

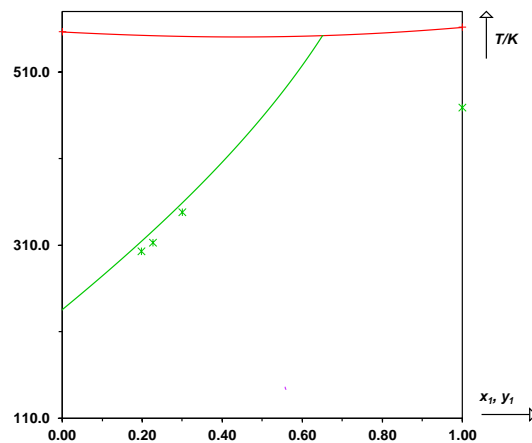
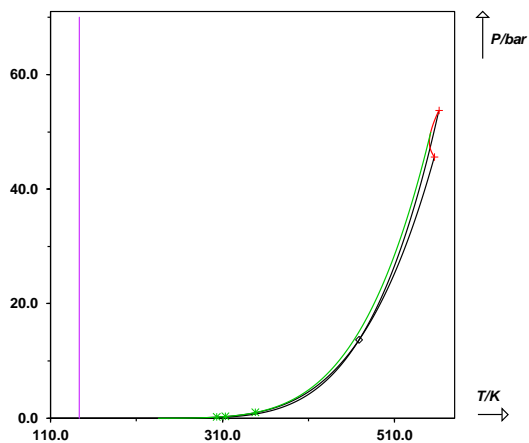
MAPE on $y = 15\%$

MAPE on $x_{\text{az}} = 7.7\%$

MAPE on $P_{\text{az}} = 1.3\%$

MAPE on $h^M = 3.2\%$

MAPE on $c_p^M = 131\%$



Isothermal phase equilibrium data

Azpiazu, Y. - Royo, F. - Gutiérrez Losa, C., Vapour pressures of (tetrachloromethane + α,ω -dichloroalkane), The Journal of Chemical Thermodynamics. 16 (1984) 561-565. doi:10.1016/0021-9614(84)90007-7

T / K = 303.15			
P / bar	x_1	y_1	
0.1576	0.9000	0.7780	
0.1691	0.7980	0.6710	
0.1724	0.7520	0.6300	
0.1751	0.7370	0.6170	
0.1796	0.6580	0.5510	
0.1862	0.5850	0.4610	
0.1916	0.4460	0.3760	
0.1954	0.3500	0.3030	
0.1981	0.2010	0.1990	
0.1981	0.1980	0.1980	AZEO
0.1965	0.0990	0.1240	

Munoz Embid, Jose - Berro, Charles - Otin, Santos - Kehiaian, Henry V., Isothermal vapor-liquid equilibria, excess enthalpies, and excess volumes of 1-chlorobutane + tetrachloromethane, 1,2-dichloroethane + tetrachloromethane, and 1,2-dichloroethane + 1-chlorobutane mixtures, Journal of Chemical & Engineering Data. 35 (1990) 266-271. doi:10.1021/je00061a012

T / K = 313.15			
P / bar	x_1	y_1	
0.2213	0.9505	0.8916	
0.2314	0.9085	0.8186	
0.2360	0.8886	0.7861	
0.2431	0.8529	0.7364	
0.2462	0.8357	0.7152	
0.2535	0.7935	0.6676	
0.2631	0.7240	0.5988	
0.2672	0.6904	0.5689	
0.2722	0.6436	0.5302	
0.2769	0.5928	0.4915	
0.2802	0.5496	0.4604	
0.2838	0.4968	0.4230	
0.2864	0.4499	0.3906	
0.2889	0.3925	0.3507	
0.2905	0.3415	0.3146	
0.2913	0.3001	0.2843	
0.2919	0.2505	0.2465	
0.2920	0.2261	0.2261	AZEO
0.2920	0.2241	0.2254	
0.2919	0.1995	0.2048	
0.2911	0.1482	0.1600	

0.2907	0.1331	0.1460
0.2878	0.0612	0.0731

Isobaric phase equilibrium data

Sagnes, Michele. - Sanchez, Victor., Vapor-liquid equilibriums for fourteen systems consisting of chlorinated hydrocarbons and alcohols, Journal of Chemical & Engineering Data. 16 (1971) 351-354. doi:10.1021/je60050a038

P / bar = 1.013			
T / K	x_1	y_1	
354.15	0.9470	0.9000	
353.15	0.9000	0.8400	
352.45	0.8600	0.7870	
351.75	0.8200	0.7400	
351.25	0.7870	0.7000	
350.55	0.7220	0.6430	
350.05	0.6850	0.6020	
349.45	0.6120	0.5320	
348.95	0.5070	0.4570	
348.55	0.4320	0.4020	
348.45	0.4050	0.3820	
348.35	0.3000	0.3000	AZEO
348.45	0.2050	0.2170	
348.65	0.1400	0.1570	
349.15	0.0620	0.0720	

Enthalpy of mixing

Baños, Irene - Valero, Jose - Gracia, Mariano - Losa, Celso Gutierrez, Conformational Equilibrium and Calorimetric Behaviour of Systems Containing 1,2-Dichloroethane, Berichte der Bunsengesellschaft für physikalische Chemie. 87 (1983) 866-871. doi:10.1002/bbpc.19830871007

T / K = 288.15	
P / bar = UNKNOWN (1.0132)	
$h^M / \text{J.mol}^{-1}$	x_1
146.00	0.9403
298.00	0.8665
376.00	0.8245
471.00	0.7653
530.00	0.7123
604.00	0.6492
625.00	0.6008
658.00	0.4997
641.00	0.4011
597.00	0.3643
580.00	0.3396

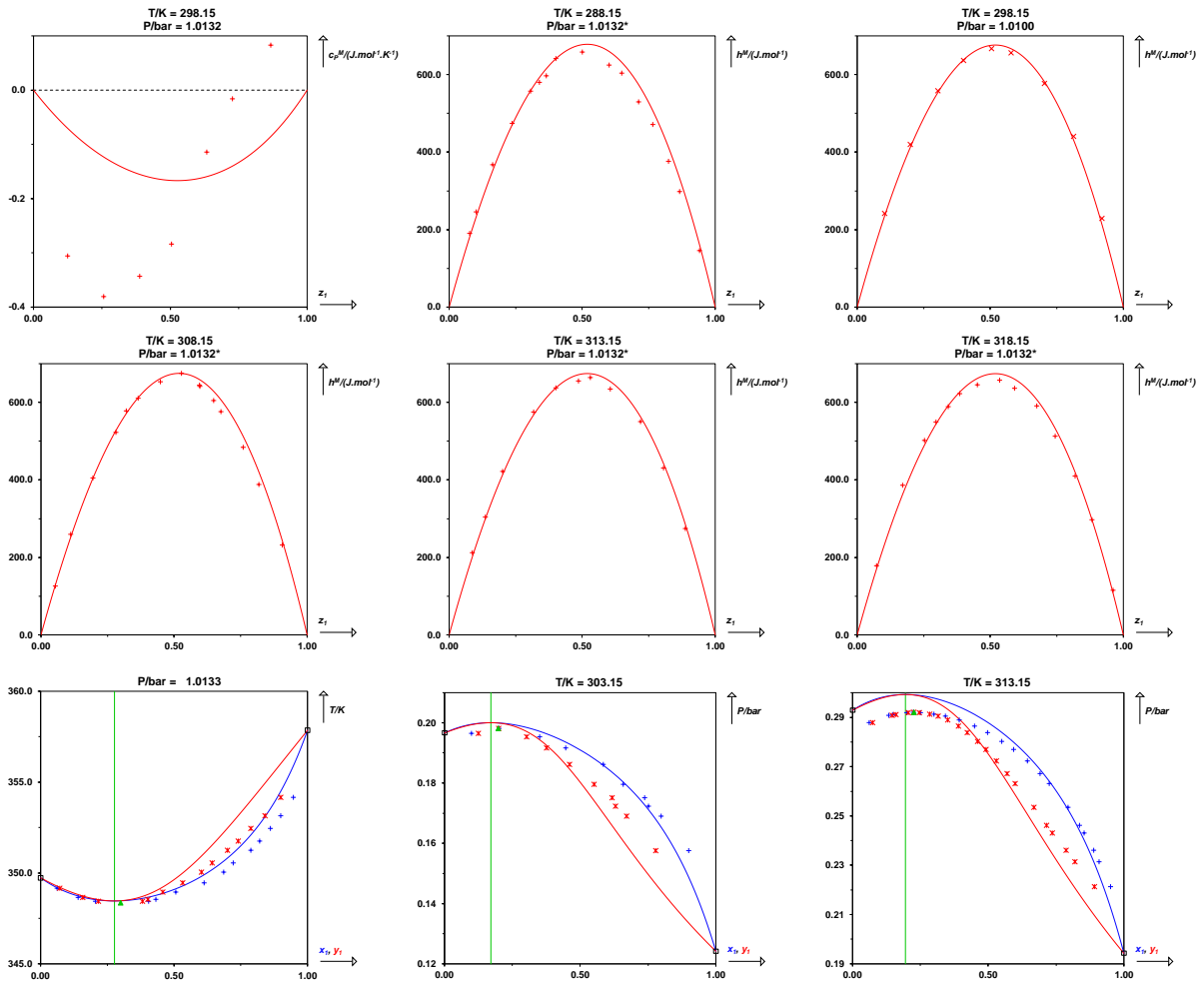
557.00	0.3052	chlorobutane mixtures, Journal of Chemical & Engineering
474.00	0.2373	Data. 35 (1990) 266-271. doi:10.1021/je00061a012
367.00	0.1635	T / K = 313.15
246.00	0.1010	P / bar = UNKNOWN (1.0132)
190.00	0.0772	$h^M / \text{J.mol}^{-1}$ x_1
		212.00 0.0873
		304.00 0.1361
		422.00 0.2005
		575.00 0.3173
		637.00 0.4015
		655.00 0.4852
		664.00 0.5311
		634.00 0.6047
		550.00 0.7198
		431.00 0.8050
		274.00 0.8873
Marongiu, B., Excess Enthalpies of alpha,omega-Dichloroalkane (C1 - C6) + Tetrachloromethane, Int. Data Ser. Sel. Data Mixtures Ser. A. (1988) 1-6.		
T / K = 298.15		
P / bar = 1.010		
$h^M / \text{J.mol}^{-1}$ z_1		
229.00 0.9200		
441.00 0.8122		
577.00 0.7033		
656.00 0.5787		
667.00 0.5046		
636.00 0.4000		
558.00 0.3036		
420.00 0.1995		
242.00 0.1021		
Baños, Irene - Valero, Jose - Gracia, Mariano - Losa, Celso Gutierrez, Conformational Equilibrium and Calorimetric Behaviour of Systems Containing 1,2-Dichloroethane, Berichte der Bunsengesellschaft für physikalische Chemie. 87 (1983) 866-871. doi:10.1002/bbpc.19830871007		
T / K = 318.15		
P / bar = UNKNOWN (1.0132)		
$h^M / \text{J.mol}^{-1}$ x_1		
115.00 0.9616		
297.00 0.8822		
410.00 0.8179		
513.00 0.7438		
591.00 0.6745		
636.00 0.5913		
657.00 0.5348		
645.00 0.4512		
623.00 0.3846		
589.00 0.3417		
549.00 0.2955		
502.00 0.2529		
386.00 0.1698		
178.00 0.0731		

Heat capacity of mixing		

Wilhelm, E. - Faradjzadeh, A. - Grolier, J.-P.E., Molar excess heat capacities and excess volumes of 1,2-dichloroethane + cyclooctane, + mesitylene, and + tetrachloromethane, The Journal of Chemical Thermodynamics. 11 (1979) 979-984. doi:10.1016/0021-9614(79)90047-8		
T / K = 298.15		
P / bar = UNKNOWN (1.0132)		
Munoz Embid, Jose - Berro, Charles - Otin, Santos - Kehiaian, Henry V., Isothermal vapor-liquid equilibria, excess enthalpies, and excess volumes of 1-chlorobutane + tetrachloromethane, 1,2-dichloroethane + tetrachloromethane, and 1,2-dichloroethane + 1-		

c_p^M J.mol ⁻¹ .K ⁻¹	/ x_1
0.0830	0.8671
-0.0160	0.7261
-0.1140	0.6333
-0.2840	0.5036
-0.3430	0.3871
-0.3810	0.2565
-0.3060	0.1241

NA-NA systems (BAC = 1)



n-HEPTANE (1) + MONOCHLOROBENZENE (2)

CAS	142-82-5	108-90-7
InChiKey	IMNFDUFMRHMDMM-UHFFFAOYSA-N	MVPPADPHJFYWMZ-UHFFFAOYSA-N
T_c / K	540.20	632.35
P_c / bar	27.40	45.19
ω	0.349	0.250

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 29.58$

$B/\text{MPa} = 37.86$

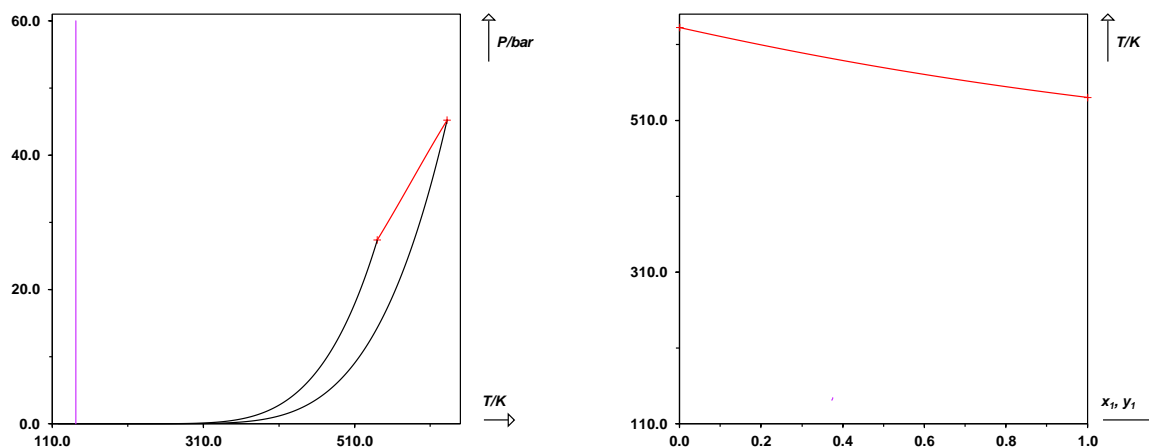
Deviations

MAPE on $x = 4.2\%$

MAPE on $y = 3.3\%$

MAPE on $h^M = 7.7\%$

MAPE on $c_p^M = 31\%$



Isothermal phase equilibrium data

Paul, H.I. - Krug, J. - Knapp, H., Measurements of VLE, vE and hE for binary mixtures of n-alkanes with chloro-alkylbenzenes, Fluid Phase Equilibria. 39 (1988) 307-324. doi:10.1016/0378-3812(88)85010-6

T / K = 323.15		
P / bar	x ₁	y ₁
0.0629	0.0200	0.1142
0.0760	0.0680	0.2972
0.0891	0.1236	0.4324
0.0951	0.1568	0.4832
0.0986	0.1724	0.5108
0.0997	0.1815	0.5190
0.1058	0.2183	0.5518
0.1167	0.2871	0.6226
0.1166	0.2880	0.6243
0.1236	0.3393	0.6630
0.1303	0.3913	0.6918
0.1426	0.5044	0.7619
0.1533	0.6154	0.8084
0.1640	0.7250	0.8662
0.1746	0.8422	0.9203
0.1823	0.9321	0.9645

Paul, H.I. - Krug, J. - Knapp, H., Measurements of VLE, vE and hE for binary mixtures of n-alkanes with chloro-alkylbenzenes, Fluid Phase Equilibria. 39 (1988) 307-324. doi:10.1016/0378-3812(88)85010-6

T / K = 338.15		
P / bar	x ₁	y ₁
0.1205	0.0229	0.1136
0.1373	0.0607	0.2466
0.1575	0.1103	0.3727
0.1770	0.1646	0.4690
0.1904	0.2107	0.5298
0.2033	0.2549	0.5698
0.2082	0.2747	0.5962
0.2146	0.2990	0.6105
0.2338	0.3860	0.6809
0.2354	0.3880	0.6763
0.2497	0.4602	0.7214
0.2614	0.5222	0.7547
0.2847	0.6571	0.8263
0.2961	0.7215	0.8555
0.3078	0.7966	0.8932
0.3180	0.8559	0.9209
0.3308	0.9460	0.9712

Paul, H.I. - Krug, J. - Knapp, H., Measurements of VLE, vE and hE for binary mixtures of n-alkanes with chloro-alkylbenzenes, Fluid Phase Equilibria. 39 (1988) 307-324. doi:10.1016/0378-3812(88)85010-6

T / K = 343.15		
P / bar	x ₁	y ₁
0.1465	0.0211	0.1019
0.2180	0.1786	0.4761
0.2411	0.2481	0.5627
0.2617	0.3173	0.6252
0.3061	0.4830	0.7326
0.3262	0.5781	0.7818
0.3457	0.6723	0.8395
0.3652	0.7742	0.8837
0.3821	0.8700	0.9298
0.3947	0.9419	0.9680

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 353.15		
P / bar	x ₁	y ₁
0.2516	0.0730	0.2660
0.2665	0.0960	0.3200
0.2756	0.1140	0.3500
0.3054	0.1690	0.4400
0.3334	0.2300	0.5150
0.3444	0.2480	0.5450
0.3893	0.3580	0.6430
0.4060	0.4100	0.6760
0.4132	0.4290	0.6910
0.4228	0.4590	0.7100
0.4334	0.4970	0.7330
0.4466	0.5380	0.7580
0.4653	0.6060	0.7960
0.4801	0.6530	0.8220
0.4934	0.7020	0.8460
0.5017	0.7360	0.8620
0.5186	0.7940	0.8920
0.5389	0.8700	0.9300
0.5465	0.9040	0.9500

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 373.15		
P / bar	x ₁	y ₁
0.4653	0.0510	0.1850
0.5394	0.1200	0.3360

NA-NA systems (BAC = 1)

0.5602	0.1410	0.3750	382.45	0.3850	0.6380
0.5814	0.1620	0.4100	380.75	0.4710	0.7000
0.6134	0.1970	0.4590	379.55	0.5160	0.7260
0.6426	0.2330	0.5050	377.85	0.6080	0.7800
0.6694	0.2660	0.5400	376.05	0.6900	0.8280
0.6857	0.2910	0.5700	374.45	0.7740	0.8700
0.7463	0.3830	0.6390	372.05	0.9240	0.9550
0.7786	0.4370	0.6780			
0.7819	0.4420	0.6820			
0.8133	0.4990	0.7170			
0.8274	0.5240	0.7330			
0.8535	0.5730	0.7630			
0.8711	0.6050	0.7825			
0.9222	0.7060	0.8370			
0.9435	0.7480	0.8610			
0.9750	0.8155	0.8980			
1.000	0.8660	0.9260			
1.016	0.9000	0.9440			

Isobaric phase equilibrium data

Al-Hayan, M. N. M. - Al-Kandary, J. A. M., Isobaric vapour-liquid equilibria for binary mixtures of n-heptane with bromobenzene, chlorobenzene and fluorobenzene at atmospheric pressure, Fluid Phase Equilibria. 240 (2006) 109-113. doi:10.1016/j.fluid.2005.11.020

P / bar = 1.013

T / K	x ₁	y ₁
402.20	0.0314	0.1103
397.30	0.0880	0.2637
392.70	0.1579	0.3991
389.10	0.2277	0.5020
386.30	0.2962	0.5766
383.70	0.3709	0.6421
380.90	0.4700	0.7138
378.20	0.5865	0.7808
375.40	0.7294	0.8541
372.90	0.8922	0.9387

Raviprasad, A. - Venkateswara Rao, K. - Chiranjivi, C., Isobaric vapor-liquid equilibrium data for the systems n-heptane-chlorobenzene and trichloroethylene-methyl isobutyl ketone (MIBK), Indian Chem. Eng. 18 (1976) 47-49.

P / bar = 1.013

T / K	x ₁	y ₁
401.85	0.0280	0.1160
400.75	0.0420	0.1580
397.65	0.0730	0.2380
390.65	0.2060	0.4750

Enthalpy of mixing

Paul, H.I. - Krug, J. - Knapp, H., Measurements of VLE, vE and hE for binary mixtures of n-alkanes with chloroalkylbenzenes, Fluid Phase Equilibria. 39 (1988) 307-324. doi:10.1016/0378-3812(88)85010-6

T / K = 288.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
302.90	0.1282
356.80	0.1576
397.00	0.1877
438.40	0.2185
476.30	0.2502
511.10	0.2827
541.20	0.3160
568.60	0.3503
589.20	0.3854
608.30	0.4215
620.90	0.4586
628.40	0.4968
627.10	0.5360
619.80	0.5764
603.40	0.6179
574.80	0.6607
541.10	0.7048
493.40	0.7502
431.80	0.7971
352.90	0.8454

Wilhelm, E. - Inglese, Americo - Grolier, J. -P. E. - Kehiaian, H.V., Enthalpy of Mixing of Chlorobenzene, 1,2-Dichlorobenzene, and 1,3-Dichlorobenzene with Some n-Alkanes, Ber. Bunsen-Ges. Phys. Chem. 82 (1978) 384-388.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
258.50	0.1108
339.10	0.1464
455.20	0.2181
552.70	0.2942

624.70	0.3781
669.50	0.4679
663.50	0.5571
612.20	0.6627
481.30	0.7757
267.80	0.8920

Grolier, J.P.E. - Sosnkowska-Kehiaian, K. - Kehiaian, H.V.,
Enthalpies de mélange des chlorures organiques avec des
hydrocarbures, J. Chim. Phys. Phys. Chim. Biol. 70 (1973)
367-373. doi:10.1051/jcp/1973700367

T / K =	298.15
P / bar =	UNKNOWN (1.0132)
$h^M / \text{J.mol}^{-1}$	x_1
450.00	0.1960
620.00	0.3360
690.00	0.4870
700.00	0.5470
650.00	0.6440
615.00	0.6770
355.00	0.8470
135.00	0.9390

Paul, H.I. - Krug, J. - Knapp, H., Measurements of VLE, vE
and hE for binary mixtures of n-alkanes with chloro-
alkylbenzenes, Fluid Phase Equilibria. 39 (1988) 307-324.
doi:10.1016/0378-3812(88)85010-6

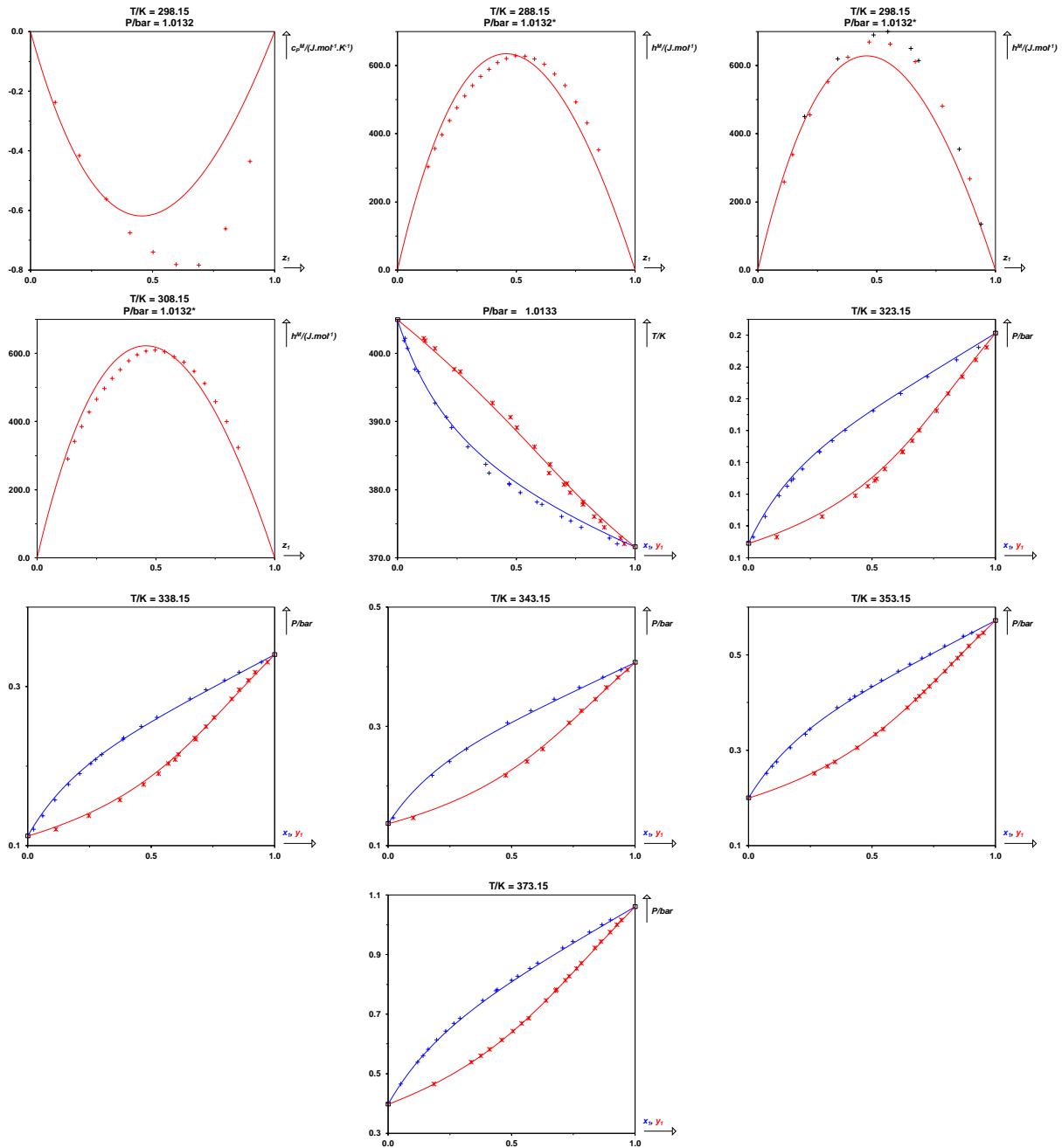
T / K =	308.15
P / bar =	UNKNOWN (1.0132)
$h^M / \text{J.mol}^{-1}$	x_1
289.80	0.1282
341.40	0.1576
385.00	0.1877
427.60	0.2185
465.10	0.2502
496.80	0.2827
526.80	0.3160
552.60	0.3503
578.40	0.3854
596.20	0.4215
606.90	0.4586
610.20	0.4968
604.50	0.5360
590.30	0.5764
574.30	0.6179
547.90	0.6607
512.20	0.7048
458.30	0.7502
400.00	0.7971
323.40	0.8454

Heat capacity of mixing

Bendiab, H. - Roux-Desgranges, G. - Roux, A. H. - Grolier,
J. -P. E. - Patterson, D., Excess heat capacities of ternary
systems containing chlorobenzene or chloronaphthalene,
Journal of Solution Chemistry. 23 (1994) 307-323.
doi:10.1007/BF00973552

T / K =	298.15
P / bar =	UNKNOWN (1.0132)
$c_P^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.2380	0.1010
-0.4160	0.1997
-0.5620	0.3107
-0.6750	0.4083
-0.7400	0.5014
-0.7820	0.5961
-0.7840	0.6894
-0.6620	0.7994
-0.4350	0.8985

NA-NA systems (BAC = 1)



METHANE (1) + HYDROGEN SULFIDE (2)

CAS	74-82-8	7783-06-4
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	RWSOTUBLDIXVET-UHFFFAOYSA-N
T_c / K	190.56	373.53
P_c / bar	45.99	89.63
ω	0.012	0.094

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 215.1$

$B/\text{MPa} = 825.9$

Deviations

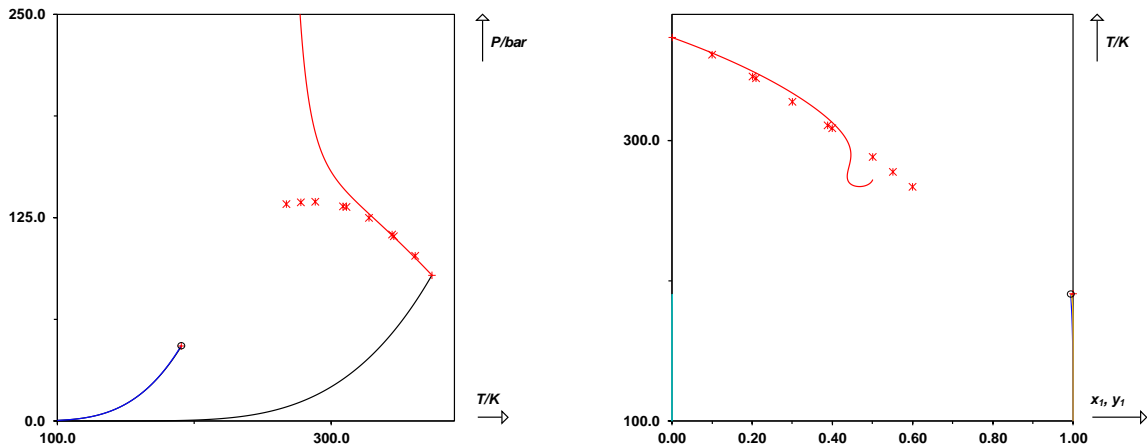
MAPE on $x = 16\%$

MAPE on $y = 3.8\%$

MAPE on $x_c = 8.9\%$

MAPE on $P_c = 17\%$

MAPE on $h^M = 19\%$



Isothermal phase equilibrium data				Isothermal phase equilibrium data			
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems - Volumetric and Phase Behavior of the Methane-Hydrogen Sulfide System, Industrial & Engineering Chemistry. 43 (1951) 976-981. doi:10.1021/ie50496a052				Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems - Volumetric and Phase Behavior of the Methane-Hydrogen Sulfide System, Industrial & Engineering Chemistry. 43 (1951) 976-981. doi:10.1021/ie50496a052			
T / K = 277.59				T / K = 344.26			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
13.79	0.0057	0.1371	75.84	55.16	0.0031	0.0196	0.0996
17.24	0.0132	0.2783	82.74	58.61	0.0098	0.0592	0.1182
20.68	0.0212	0.3896	86.18	62.05	0.0167	0.0946	0.1282
24.13	0.0284	0.4604	89.63	68.95	0.0309	0.1553	0.1390
27.58	0.0354	0.5126	96.53	75.84	0.0459	0.2021	0.1620
31.03	0.0424	0.5551	103.42	82.74	0.0622	0.2367	0.1885
34.47	0.0493	0.5879	110.32	86.18	0.0720	0.2534	0.2192
41.37	0.0636	0.6394	117.21	89.63	0.0814	0.2646	0.2532
48.26	0.0783	0.6755	120.66	96.53	0.1021	0.2811	0.2725
55.16	0.0930	0.6989	124.11	103.42	0.1245	0.2775	0.2940
62.05	0.1083	0.7141	131.00	110.32	0.1547	0.2580	0.3185
68.95	0.1250	0.7242	134.38	113.76	0.1830	0.2295	0.3578
75.84	0.1433	0.7299		114.45	0.2090	0.2090	0.3880
82.74	0.1635	0.7321					CRIT
86.18	0.1750	0.7319					
89.63	0.1868	0.7306					
96.53	0.2137	0.7262					
103.42	0.2450	0.7185					
110.32	0.2798	0.7075					
117.21	0.3240	0.6931					
120.66	0.3492	0.6828					
124.11	0.3758	0.6686					
131.00	0.4401	0.6130					
134.38	0.5500	0.5500	CRIT				

Isothermal phase equilibrium data				Isothermal phase equilibrium data			
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems - Volumetric and Phase Behavior of the Methane-Hydrogen Sulfide System, Industrial & Engineering Chemistry. 43 (1951) 976-981. doi:10.1021/ie50496a052				Kohn, James P. - Kurata, Fred, Heterogeneous phase equilibria of the methane—hydrogen sulfide system, AIChE Journal. 4 (1958) 211-217. doi:10.1002/aic.690040217			
T / K = 310.93				P / bar = 13.79			
P / bar	x ₁	y ₁		T / K	x ₁	y ₁	
27.58	0.0007	0.0117		277.59	0.0050	0.1400	
31.03	0.0067	0.0963		255.38	0.0090	0.5220	
34.47	0.0128	0.1642		233.15	0.0125	0.7540	
37.92	0.0190	0.2203		210.93	0.0180	0.9060	
41.37	0.0255	0.2688					
48.26	0.0385	0.3416					
55.16	0.0523	0.3976					
62.05	0.0670	0.4396					
68.95	0.0828	0.4707					

Isothermal phase equilibrium data				Isothermal phase equilibrium data			
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems - Volumetric and Phase Behavior of the Methane-Hydrogen Sulfide System, Industrial & Engineering Chemistry. 43 (1951) 976-981. doi:10.1021/ie50496a052				Kohn, James P. - Kurata, Fred, Heterogeneous phase equilibria of the methane—hydrogen sulfide system, AIChE Journal. 4 (1958) 211-217. doi:10.1002/aic.690040217			
T / K = 310.93				P / bar = 13.79			
P / bar	x ₁	y ₁		T / K	x ₁	y ₁	
27.58	0.0007	0.0117		277.59	0.0050	0.1400	
31.03	0.0067	0.0963		255.38	0.0090	0.5220	
34.47	0.0128	0.1642		233.15	0.0125	0.7540	
37.92	0.0190	0.2203		210.93	0.0180	0.9060	
41.37	0.0255	0.2688					
48.26	0.0385	0.3416					
55.16	0.0523	0.3976					
62.05	0.0670	0.4396					
68.95	0.0828	0.4707					

AICHE Journal. 4 (1958) 211-217.

doi:10.1002/aic.690040217

P / bar = 55.15

T / K	x ₁	y ₁
338.70	0.0100	0.1040
322.03	0.0350	0.2900
310.92	0.0510	0.4050
299.81	0.0680	0.5010
288.70	0.0860	0.5960
277.59	0.0900	0.6900

Kohn, James P. - Kurata, Fred, Heterogeneous phase equilibria of the methane—hydrogen sulfide system,

AICHE Journal. 4 (1958) 211-217.

doi:10.1002/aic.690040217

P / bar = 82.73

T / K	x ₁	y ₁
366.48	0.0060	0.0250
344.26	0.0520	0.2380
322.03	0.0950	0.4320
299.81	0.1350	0.5820
277.59	0.1620	0.7270

Kohn, James P. - Kurata, Fred, Heterogeneous phase equilibria of the methane—hydrogen sulfide system,

AICHE Journal. 4 (1958) 211-217.

doi:10.1002/aic.690040217

P / bar = 110.31

T / K	x ₁	y ₁
344.26	0.1550	0.2500
322.03	0.1840	0.4410
310.92	0.2000	0.5200
299.81	0.2130	0.5860
277.59	0.2380	0.7050

Enthalpy of mixing

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-

hydrogen sulfide by flow calorimetry, Journal of Chemical & Engineering Data. 27 (1982) 436-439.

doi:10.1021/je00030a020

T / K = 293.15

P / bar = 5.070

h ^M / J.mol ⁻¹	z ₁
28.30	0.2030
43.60	0.3990
44.80	0.5600
41.20	0.6720
40.50	0.7100
38.80	0.7770

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-hydrogen sulfide by flow calorimetry, Journal of Chemical & Engineering Data. 27 (1982) 436-439.

doi:10.1021/je00030a020

T / K = 293.15

P / bar = 10.13

h ^M / J.mol ⁻¹	z ₁
79.80	0.2650
101.10	0.4310
97.10	0.6590

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-

hydrogen sulfide by flow calorimetry, Journal of Chemical & Engineering Data. 27 (1982) 436-439.

doi:10.1021/je00030a020

T / K = 293.15

P / bar = 15.20

h ^M / J.mol ⁻¹	z ₁
123.60	0.1840
149.50	0.2450
190.80	0.4830
184.60	0.5940
138.80	0.7930

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-

hydrogen sulfide by flow calorimetry, Journal of Chemical & Engineering Data. 27 (1982) 436-439.

doi:10.1021/je00030a020

T / K = 305.15

P / bar = 5.070

h ^M / J.mol ⁻¹	z ₁
23.80	0.2060
39.70	0.4560
40.70	0.6210
37.00	0.7380

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-

hydrogen sulfide by flow calorimetry, Journal of Chemical & Engineering Data. 27 (1982) 436-439.

doi:10.1021/je00030a020

T / K = 305.15

P / bar = 10.13

h ^M / J.mol ⁻¹	z ₁
60.40	0.1840
90.80	0.3920
95.00	0.4490
69.80	0.7820

97.30 0.7780

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-hydrogen sulfide by flow calorimetry, *Journal of Chemical & Engineering Data*. 27 (1982) 436-439. doi:10.1021/je00030a020

T / K = 305.15

P / bar = 15.20

$h^M / \text{J.mol}^{-1}$	z_1
148.80	0.2740
163.80	0.4430
167.50	0.5680
83.30	0.8470

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-hydrogen sulfide by flow calorimetry, *Journal of Chemical & Engineering Data*. 27 (1982) 436-439. doi:10.1021/je00030a020

T / K = 313.15

P / bar = 5.070

$h^M / \text{J.mol}^{-1}$	z_1
34.60	0.3240
42.50	0.3860
43.90	0.4460
33.20	0.6930

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-hydrogen sulfide by flow calorimetry, *Journal of Chemical & Engineering Data*. 27 (1982) 436-439. doi:10.1021/je00030a020

T / K = 313.15

P / bar = 10.13

$h^M / \text{J.mol}^{-1}$	z_1
68.00	0.2370
78.80	0.3510
90.40	0.4830
83.60	0.6920
64.70	0.7800

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Excess enthalpies of the binary system methane-hydrogen sulfide by flow calorimetry, *Journal of Chemical & Engineering Data*. 27 (1982) 436-439. doi:10.1021/je00030a020

T / K = 313.15

P / bar = 15.20

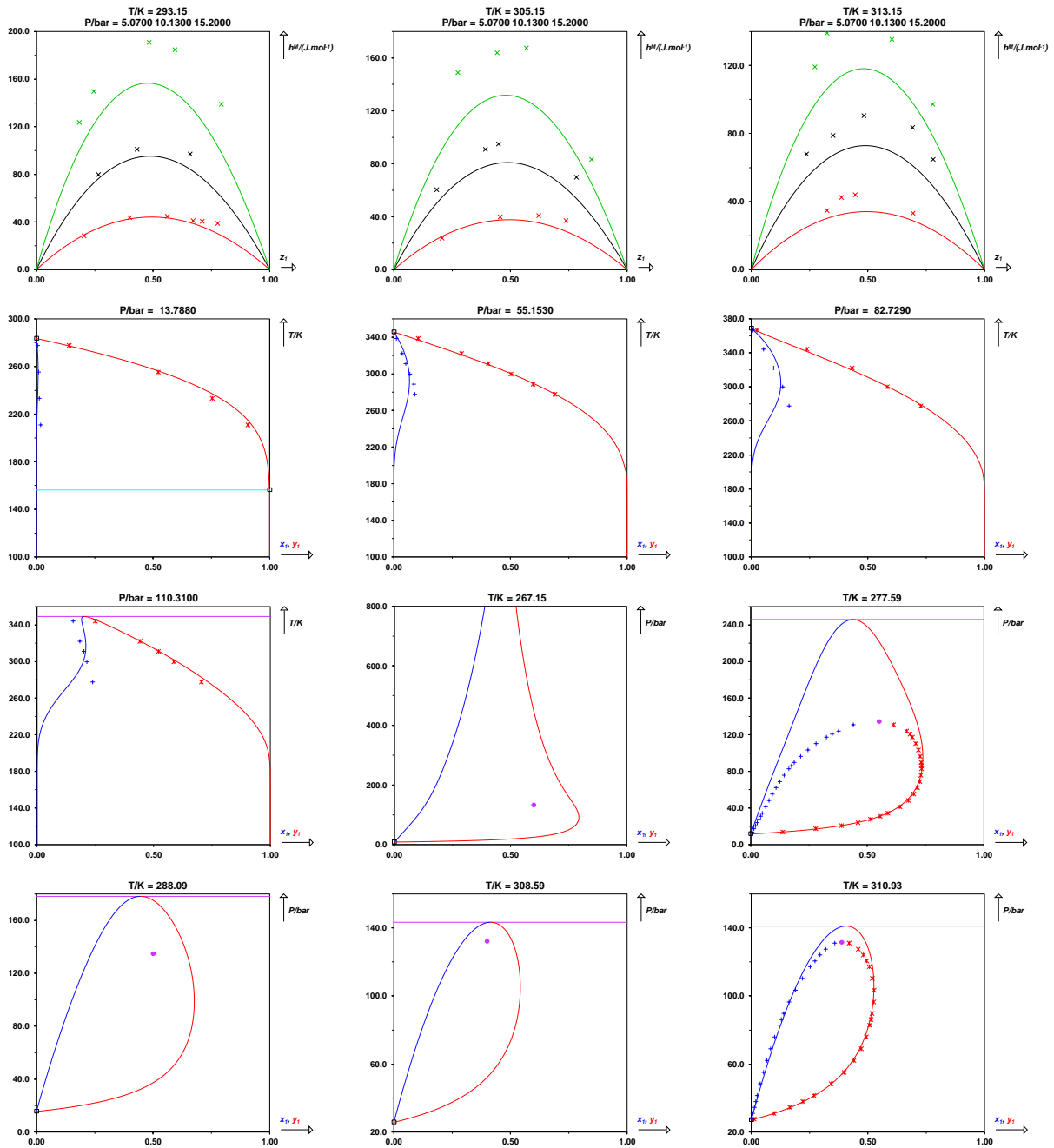
$h^M / \text{J.mol}^{-1}$	z_1
119.20	0.2720
139.00	0.3240
135.50	0.6020

Critical point

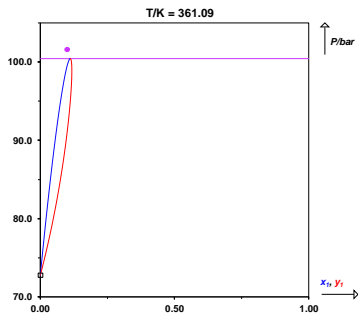
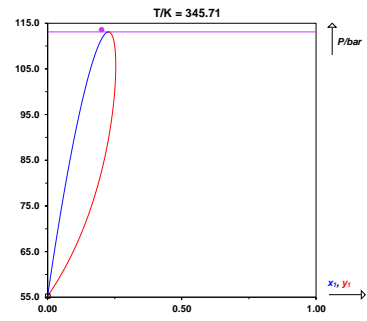
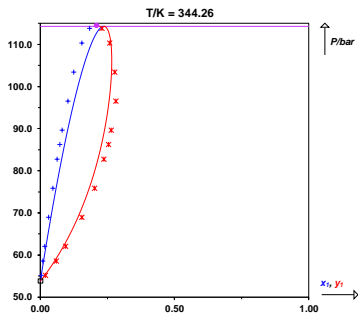
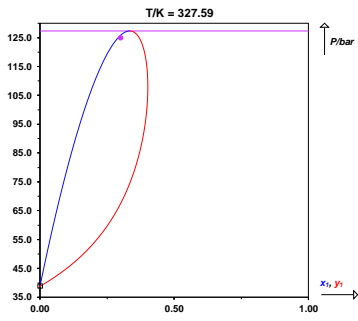
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems - Volumetric and Phase Behavior of the Methane-Hydrogen Sulfide System, *Industrial & Engineering Chemistry*. 43 (1951) 976-981. doi:10.1021/ie50496a052

T / K	P / bar	x_1
267.15	133.48	0.6000
288.09	134.72	0.5000
308.59	132.03	0.4000
327.59	124.93	0.3000
345.71	113.56	0.2000
361.09	101.56	0.1000

HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



METHANE (1) + CARBON DIOXIDE (2)

CAS	74-82-8	124-38-9
InChiKey	VNWK TOKETHGBQD-UHFFFAOYSA-N	CURLTUGMZLYLDI-UHFFFAOYSA-N
T_c / K	190.56	304.21
P_c / bar	45.99	73.83
ω	0.012	0.224

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 131.9$

$B/\text{MPa} = 219.6$

Deviations

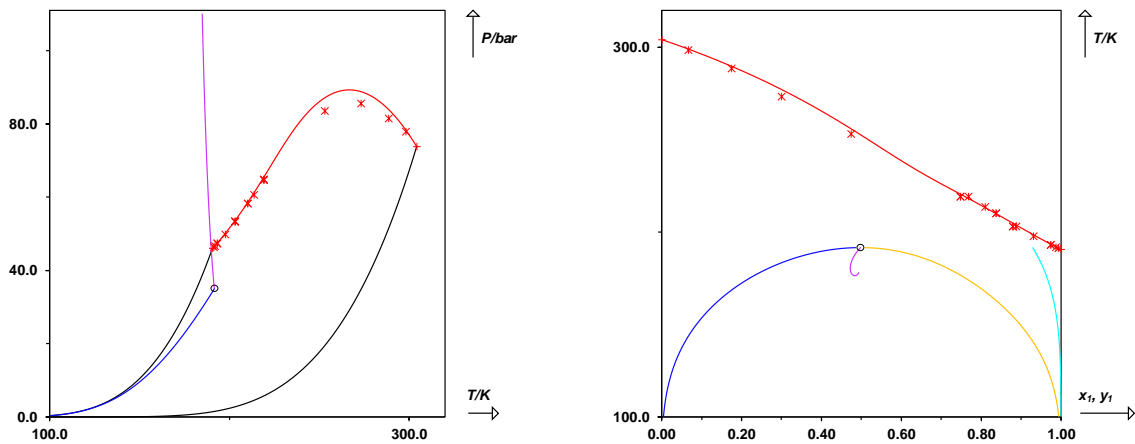
MAPE on $x = 4.5\%$

MAPE on $y = 2.4\%$

MAPE on $x_c = 4.3\%$

MAPE on $P_c = 1.1\%$

MAPE on $h^M = 12\%$



-----			49.64	0.7683	0.8962
Isothermal phase equilibrium data			50.33	0.7879	0.8973
-----			51.02	0.8051	0.8976
Mraw, Stephen C. - Hwang, Shuen-Cheng - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-carbon dioxide system at low temperatures, Journal of Chemical & Engineering Data. 23 (1978) 135-139. doi:10.1021/je60077a014			51.71	0.8229	0.8978
T / K = 173.15			52.40	0.8388	0.8967
P / bar	x ₁	y ₁	53.09	0.8568	0.8933
24.66	0.9507	0.9896	53.37	0.8784	0.8784 CRIT
24.82	0.9563	0.9908	Mraw, Stephen C. - Hwang, Shuen-Cheng - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-carbon dioxide system at low temperatures, Journal of Chemical & Engineering Data. 23 (1978) 135-139. doi:10.1021/je60077a014		
25.17	0.9686	0.9934	T / K = 210.15		
25.51	0.9809	0.9960	P / bar	x ₁	y ₁
Mraw, Stephen C. - Hwang, Shuen-Cheng - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-carbon dioxide system at low temperatures, Journal of Chemical & Engineering Data. 23 (1978) 135-139. doi:10.1021/je60077a014			42.20	0.3062	0.8482
T / K = 183.15			43.09	0.3175	0.8568
P / bar	x ₁	y ₁	44.82	0.3604	0.8587
33.60	0.9350	0.9770	46.54	0.4056	0.8596
33.78	0.9393	0.9785	48.26	0.4555	0.8602
34.47	0.9553	0.9842	49.99	0.5205	0.8609
35.16	0.9712	0.9898	51.71	0.5881	0.8610
35.85	0.9872	0.9955	53.43	0.6486	0.8608
Mraw, Stephen C. - Hwang, Shuen-Cheng - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-carbon dioxide system at low temperatures, Journal of Chemical & Engineering Data. 23 (1978) 135-139. doi:10.1021/je60077a014			55.16	0.7018	0.8587
T / K = 193.15			56.88	0.7544	0.8539
P / bar	x ₁	y ₁	Al-Sahhaf, Taher A. - Kidnay, Arthur J. - Sloan, E. Dendy, Liquid + vapor equilibriums in the nitrogen + carbon dioxide + methane system, Industrial & Engineering Chemistry Fundamentals. 22 (1983) 372-380. doi:10.1021/i100012a004		
42.89	0.8853	0.9473	T / K = 219.26		
43.44	0.8992	0.9507	P / bar	x ₁	y ₁
44.13	0.9136	0.9554	13.98	0.0339	0.5457
44.82	0.9272	0.9591	19.00	0.0579	0.6493
45.51	0.9385	0.9635	24.32	0.0859	0.7100
46.20	0.9517	0.9677	31.20	0.1308	0.7590
46.88	0.9622	0.9718	38.61	0.1923	0.7890
Mraw, Stephen C. - Hwang, Shuen-Cheng - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-carbon dioxide system at low temperatures, Journal of Chemical & Engineering Data. 23 (1978) 135-139. doi:10.1021/je60077a014			Mraw, Stephen C. - Hwang, Shuen-Cheng - Kobayashi, Riki, Vapor-liquid equilibrium of the methane-carbon dioxide system at low temperatures, Journal of Chemical & Engineering Data. 23 (1978) 135-139. doi:10.1021/je60077a014		
T / K = 203.15			T / K = 219.26		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
48.26	0.7307	0.8914	6.895	0.0049	0.1860
48.95	0.7491	0.8952	13.79	0.0355	0.5461
			20.68	0.0681	0.6745
			27.58	0.1054	0.7384
			34.47	0.1535	0.7740
			41.37	0.2180	0.7960

HA-NA systems (BAC = 2)

48.26	0.3056	0.8078	22.57	0.0597	0.5512
55.16	0.4368	0.8115	24.88	0.0714	0.5851
62.05	0.6204	0.8027	33.75	0.1199	0.6670
63.43	0.6620	0.7948	40.03	0.1617	0.7012

Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002

T / K = 230.00

P / bar	x ₁	y ₁
10.78	0.0070	0.1553
11.50	0.0209	0.1941
14.53	0.0221	0.3480
15.20	0.0282	0.3766
17.86	0.0365	0.4550
20.92	0.0503	0.5218
25.30	0.0719	0.5851
25.51	0.0730	0.5929
29.16	0.0920	0.6320
35.03	0.1269	0.6770
35.50	0.1302	0.6792
39.68	0.1577	0.7005
45.60	0.2037	0.7200
45.65	0.2042	0.7237
51.16	0.2560	0.7368
55.70	0.3018	0.7393
56.40	0.3171	0.7449
58.55	0.3416	0.7466
60.86	0.3805	0.7461
63.53	0.4187	0.7448
64.90	0.4362	0.7381
65.86	0.4523	0.7411
65.90	0.4511	0.7423
66.63	0.4762	0.7369
67.36	0.4952	0.7338
69.01	0.5407	0.7247
69.91	0.5814	0.7004

Webster, Leigh A. - Kidnay, Arthur J., Vapor-Liquid Equilibria for the Methane-Propane-Carbon Dioxide Systems at 230 K and 270 K, Journal of Chemical & Engineering Data. 46 (2001) 759-764. doi:10.1021/je000307d

T / K = 230.00

P / bar	x ₁	y ₁
14.20	0.0213	0.3385
16.51	0.0307	0.4196
19.31	0.0441	0.4900

44.97	0.1994	0.7199
55.73	0.3093	0.7432
58.36	0.3404	0.7454
62.41	0.4010	0.7443
64.17	0.4323	0.7442
65.12	0.4530	0.7422
66.54	0.4815	0.7382
66.49	0.4862	0.7371
69.12	0.5302	0.7286
69.70	0.5393	0.7245
70.00	0.5480	0.7217
70.04	0.5521	0.7222
70.72	0.5682	0.7156
71.12	0.5774	0.7102
71.45	0.5888	0.7066

Al-Sahhaf, Taher A. - Kidnay, Arthur J. - Sloan, E. Dendy, Liquid + vapor equilibria in the nitrogen + carbon dioxide + methane system, Industrial & Engineering Chemistry Fundamentals. 22 (1983) 372-380. doi:10.1021/i100012a004

T / K = 240.00

P / bar	x ₁	y ₁
21.04	0.0328	0.3480
30.59	0.0761	0.5160
40.89	0.1315	0.6050
51.98	0.2074	0.6550
61.20	0.2873	0.6742
66.57	0.3475	0.6771
70.73	0.4016	0.6728
72.65	0.4315	0.6672
73.97	0.4525	0.6624
75.94	0.4914	0.6473
76.60	0.5048	0.6388
77.72	0.5475	0.6199

Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002

T / K = 250.00

P / bar	x ₁	y ₁
19.67	0.0065	0.0782
20.71	0.0106	0.1174
23.15	0.0201	0.1952

HA-NA systems (BAC = 2)

24.88	0.0269	0.2408	55.03	0.0948	0.3128
27.59	0.0379	0.3001	65.37	0.1479	0.3702
29.64	0.0465	0.3381	69.59	0.1739	0.3847
31.31	0.0536	0.3655	73.05	0.1949	0.3945
34.46	0.0676	0.4090	79.46	0.2435	0.3977
38.36	0.0863	0.4533	80.03	0.2490	0.3974
42.00	0.1041	0.4855	81.31	0.2602	0.3934
47.92	0.1368	0.5262	82.07	0.2688	0.3894
53.78	0.1715	0.5559	83.89	0.2901	0.3762
61.50	0.2246	0.5812	84.19	0.2991	0.3704
67.15	0.2711	0.5914			
73.99	0.3366	0.5856			
76.84	0.3718	0.5761			
79.83	0.4163	0.5523			
80.53	0.4252	0.5408			

Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002

T / K = 270.00

P / bar	x ₁	y ₁
35.58	0.0151	0.0766
36.73	0.0198	0.1047
38.83	0.0305	0.1461
41.46	0.0377	0.1778
45.06	0.0504	0.2203
49.15	0.0724	0.2661
58.51	0.1154	0.3372
70.93	0.1834	0.3942
78.68	0.2407	0.4061
81.97	0.2696	0.3952
82.82	0.2803	0.3887
83.81	0.2995	0.3782

Webster, Leigh A. - Kidnay, Arthur J., Vapor-Liquid Equilibria for the Methane-Propane-Carbon Dioxide Systems at 230 K and 270 K, Journal of Chemical & Engineering Data. 46 (2001) 759-764. doi:10.1021/je000307d

T / K = 270.00

P / bar	x ₁	y ₁
38.83	0.0264	0.1352
39.13	0.0276	0.1402
41.04	0.0342	0.1680
44.13	0.0477	0.2093
47.87	0.0640	0.2517
49.87	0.0723	0.2706
54.33	0.0919	0.3085

Al-Sahhaf, Taher A. - Kidnay, Arthur J. - Sloan, E. Dendy, Liquid + vapor equilibriums in the nitrogen + carbon dioxide + methane system, Industrial & Engineering Chemistry Fundamentals. 22 (1983) 372-380. doi:10.1021/i100012a004

T / K = 270.00

P / bar	x ₁	y ₁
36.73	0.0183	0.1048
38.10	0.0235	0.1273
43.87	0.0457	0.2086
51.83	0.0793	0.2885
59.43	0.1167	0.3451
61.56	0.1261	0.3543
70.83	0.1785	0.3901
79.69	0.2463	0.3980
82.23	0.2737	0.3916
84.15	0.3060	0.3742

Somait, Fahad A. - Kidnay, Arthur J., Liquid-vapor equilibriums at 270.00 K for systems containing nitrogen, methane, and carbon dioxide, Journal of Chemical & Engineering Data. 23 (1978) 301-305. doi:10.1021/je60079a019

T / K = 270.00

P / bar	x ₁	y ₁
38.35	0.0237	0.1269
43.92	0.0455	0.2082
45.60	0.0538	0.2300
48.79	0.0666	0.2629
52.69	0.0838	0.2962
60.80	0.1226	0.3519
60.80	0.1226	0.3519
66.27	0.1533	0.3774
77.01	0.2224	0.4006
82.48	0.2740	0.3895
84.32	0.3060	0.3726

Xu, Nanping - Dong, Junhang - Wang, Yanru - Shi, Jun, High pressure vapor liquid equilibria at 293 K for systems containing nitrogen, methane and carbon dioxide, Fluid

HA-NA systems (BAC = 2)

Phase Equilibria. 81 (1992) 175-186. doi:10.1016/0378-3812(92)85150-7

T / K = 288.50

P / bar	x ₁	y ₁	
55.90	0.0150	0.0520	
62.10	0.0420	0.1080	
71.10	0.0860	0.1670	
75.10	0.1120	0.1850	
78.20	0.1280	0.1950	
78.70	0.1290	0.1940	
81.50	0.1750	0.1750	CRIT

Xu, N. - Dong, J. - Wang, Y. - Shi, J., Vapor Liquid Equilibria For N₂-CH₄-CO₂ System Near Critical Region, Huagong Xuebao. 43 (1992) 640-644.

T / K = 298.36

P / bar	x ₁	y ₁	
72.90	0.0300	0.0560	
75.00	0.0420	0.0660	
76.80	0.0520	0.0720	
77.40	0.0580	0.0710	
77.80	0.0670	0.0670	CRIT

Enthalpy of mixing

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 283.15

P / bar = 10.13

h ^M / J.mol ⁻¹	z ₁
17.00	0.1000
29.00	0.2000
46.00	0.4000
47.00	0.5000
40.00	0.6000
32.00	0.7000
24.00	0.8000
13.00	0.9000

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Direct determination of enthalpy of mixing for the binary gaseous system methane-carbon dioxide by an isothermal flow calorimeter, Journal of Chemical & Engineering Data. 27 (1982) 258-264. doi:10.1021/je00029a010

T / K = 293.15

P / bar = 5.070

h ^M / J.mol ⁻¹	z ₁
17.90	0.2530

25.63	0.4770
26.39	0.5010
18.45	0.8160

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 293.15

P / bar = 30.40

h ^M / J.mol ⁻¹	z ₁
80.00	0.1000
134.00	0.2000
180.00	0.4000
177.00	0.5000
165.00	0.6000
143.00	0.7000
102.00	0.8000
56.00	0.9000

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Direct determination of enthalpy of mixing for the binary gaseous system methane-carbon dioxide by an isothermal flow calorimeter, Journal of Chemical & Engineering Data. 27 (1982) 258-264. doi:10.1021/je00029a010

T / K = 305.15

P / bar = 15.20

h ^M / J.mol ⁻¹	z ₁
38.85	0.1810
57.82	0.4430
50.23	0.6890
31.01	0.8430

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 305.15

P / bar = 40.53

h ^M / J.mol ⁻¹	z ₁
105.00	0.1000
162.00	0.2000
223.00	0.4000
224.00	0.5000
208.00	0.6000
175.00	0.7000
130.00	0.8000
71.00	0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian

Journal of Chemical Engineering. 50 (1972) 95-100.
doi:10.1002/cjce.5450500117

T / K = 305.15
P / bar = 81.06

$h^M / J.mol^{-1}$ z_1

3600.0	0.1000
3990.0	0.2000
3500.0	0.4000
3040.0	0.5000
2540.0	0.6000
1915.0	0.7000
1330.0	0.8000
691.00	0.9000

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Direct determination of enthalpy of mixing for the binary gaseous system methane-carbon dioxide by an isothermal flow calorimeter, Journal of Chemical & Engineering Data. 27 (1982) 258-264.
doi:10.1021/je00029a010

T / K = 313.15
P / bar = 5.070

$h^M / J.mol^{-1}$ z_1

11.17	0.2520
18.51	0.4560
14.60	0.6440
9.881	0.7700

Barry, Alpha O. - Kaliaguine, Serge C. - Ramalho, Rubens S., Direct determination of enthalpy of mixing for the binary gaseous system methane-carbon dioxide by an isothermal flow calorimeter, Journal of Chemical & Engineering Data. 27 (1982) 258-264.
doi:10.1021/je00029a010

T / K = 313.15
P / bar = 46.00

$h^M / J.mol^{-1}$ z_1

137.50	0.1580
220.00	0.3510
226.88	0.5140
193.13	0.6860
145.05	0.7820

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100.
doi:10.1002/cjce.5450500117

T / K = 313.15
P / bar = 40.53

$h^M / J.mol^{-1}$ z_1

80.00	0.1000
128.00	0.2000

180.00	0.4000
180.00	0.5000
165.00	0.6000
141.00	0.7000
103.00	0.8000
55.00	0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100.
doi:10.1002/cjce.5450500117

T / K = 313.15
P / bar = 81.06

$h^M / J.mol^{-1}$ z_1

878.00	0.1000
1210.0	0.2000
1243.0	0.4000
1168.0	0.5000
998.00	0.6000
800.00	0.7000
577.00	0.8000
298.00	0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100.
doi:10.1002/cjce.5450500117

T / K = 323.15
P / bar = 10.13

$h^M / J.mol^{-1}$ z_1

9.000	0.1000
18.00	0.2000
30.00	0.4000
31.00	0.5000
29.00	0.6000
24.00	0.7000
17.00	0.8000
8.000	0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100.
doi:10.1002/cjce.5450500117

T / K = 323.15
P / bar = 50.66

$h^M / J.mol^{-1}$ z_1

90.00	0.1000
165.00	0.2000
245.00	0.4000
245.00	0.5000
220.00	0.6000

187.00 0.7000
 135.00 0.8000
 78.00 0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 323.15

P / bar = 91.19

$h^M / \text{J.mol}^{-1}$ z_1

570.00 0.1000
 850.00 0.2000
 1040.0 0.4000
 1000.0 0.5000
 900.00 0.6000
 740.00 0.7000
 550.00 0.8000
 305.00 0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 333.15

P / bar = 30.40

$h^M / \text{J.mol}^{-1}$ z_1

32.00 0.1000
 55.00 0.2000
 90.00 0.4000
 97.00 0.5000
 90.00 0.6000
 77.00 0.7000
 55.00 0.8000
 30.00 0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 333.15

P / bar = 70.93

$h^M / \text{J.mol}^{-1}$ z_1

185.00 0.1000
 300.00 0.2000
 387.00 0.4000
 376.00 0.5000
 335.00 0.6000
 282.00 0.7000
 215.00 0.8000
 114.00 0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 343.15

P / bar = 10.13

$h^M / \text{J.mol}^{-1}$ z_1

7.000 0.1000
 16.00 0.2000
 22.00 0.4000
 24.00 0.5000
 22.00 0.6000
 19.00 0.7000
 15.00 0.8000
 6.000 0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 343.15

P / bar = 50.66

$h^M / \text{J.mol}^{-1}$ z_1

70.00 0.1000
 120.00 0.2000
 163.00 0.4000
 165.00 0.5000
 153.00 0.6000
 130.00 0.7000
 96.00 0.8000
 53.00 0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian Journal of Chemical Engineering. 50 (1972) 95-100. doi:10.1002/cjce.5450500117

T / K = 343.15

P / bar = 91.19

$h^M / \text{J.mol}^{-1}$ z_1

235.00 0.1000
 410.00 0.2000
 520.00 0.4000
 510.00 0.5000
 470.00 0.6000
 395.00 0.7000
 285.00 0.8000
 155.00 0.9000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous mixtures of carbon dioxide with methane, The Canadian

Journal of Chemical Engineering. 50 (1972) 95-100.
doi:10.1002/cjce.5450500117

T / K = 353.15

P / bar = 30.40

$h^M / J.mol^{-1}$ z_1

28.00 0.1000

48.00 0.2000

73.00 0.4000

76.00 0.5000

70.00 0.6000

58.00 0.7000

46.00 0.8000

26.00 0.9000

203.15 53.45 0.8784

210.15 58.26 0.8370

219.26 64.74 0.7483

219.26 64.87 0.7483

Arai, Yasuhiko - Kaminishi, Gen-Ichi - Saito, Shozaburo,
The Experimental Determination Of The P-V-T-X Relations
For The Carbon Dioxide-Nitrogen And The Carbon
Dioxide-Methane Systems, Journal of Chemical
Engineering of Japan. 4 (1971) 113-122.
doi:10.1252/jcej.4.113

T / K P / bar x_1

253.15 83.49 0.4750

273.15 85.52 0.3000

Lee, J. I. - Mather, A. E., The excess enthalpy of gaseous
mixtures of carbon dioxide with methane, The Canadian
Journal of Chemical Engineering. 50 (1972) 95-100.
doi:10.1002/cjce.5450500117

T / K = 353.15

P / bar = 70.93

$h^M / J.mol^{-1}$ z_1

111.00 0.1000

187.00 0.2000

262.00 0.4000

264.00 0.5000

245.00 0.6000

210.00 0.7000

157.00 0.8000

86.00 0.9000

Critical point

Hwang, S.C. - Lin, H.M. - Chappellear, P.S. - Kobayashi, R.,
Dew-Point Values for the Methane - Carbon Dioxide
System, GPA Research Report. (1976) 1-14.

T / K P / bar x_1

191.20 46.33 0.9932

191.87 46.68 0.9873

193.15 47.30 0.9736

197.59 49.85 0.9314

203.15 53.30 0.8880

210.15 58.19 0.8370

213.71 60.67 0.8100

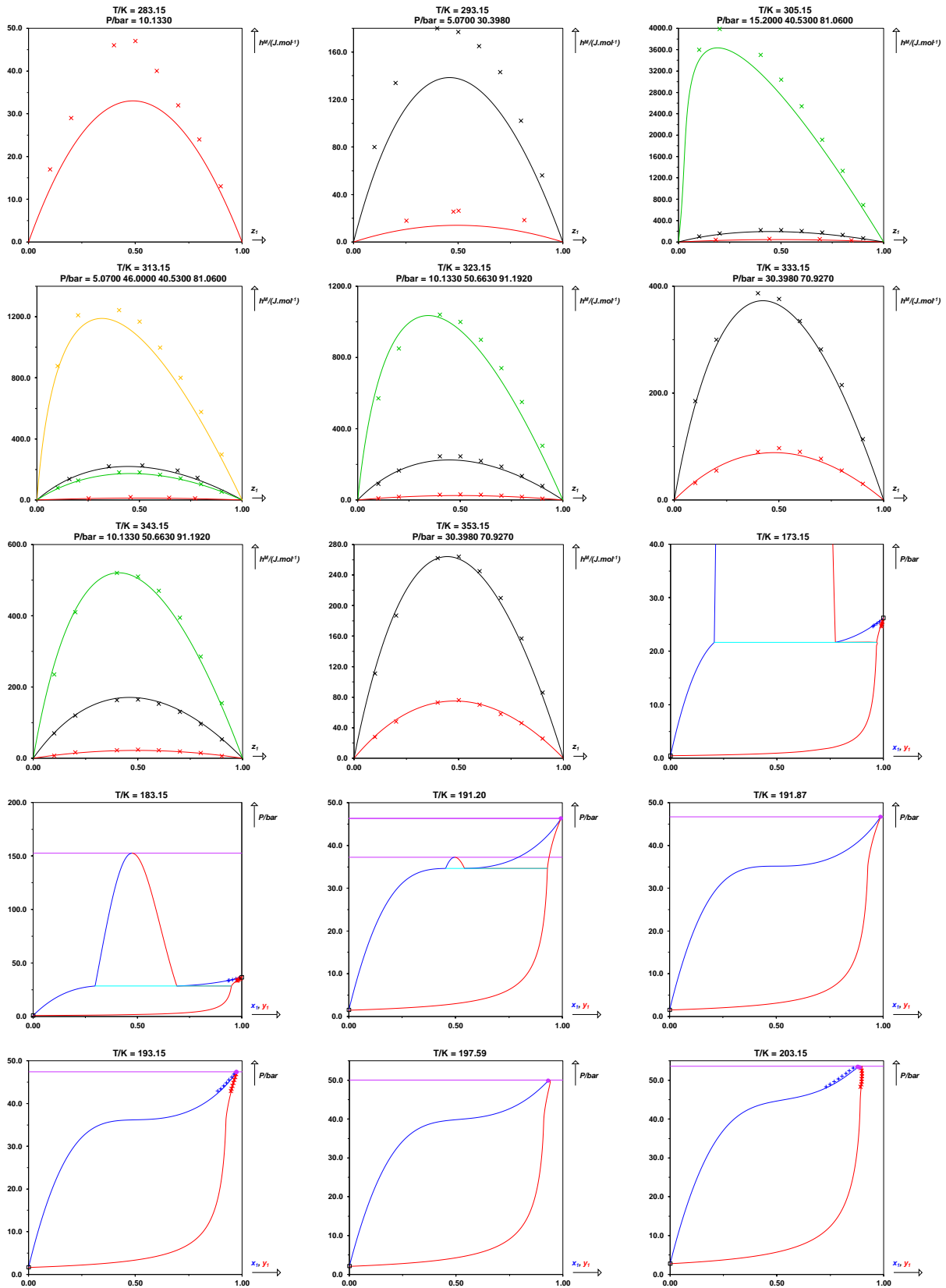
219.26 64.67 0.7680

Mraw, S.C. - Hwang, S.C. - Kobayashi, R., The Vapor-Liquid
Equilibrium of the CH₄ - CO₂ System at Low
Temperatures, GPA Research Report. (1977) 1-18.

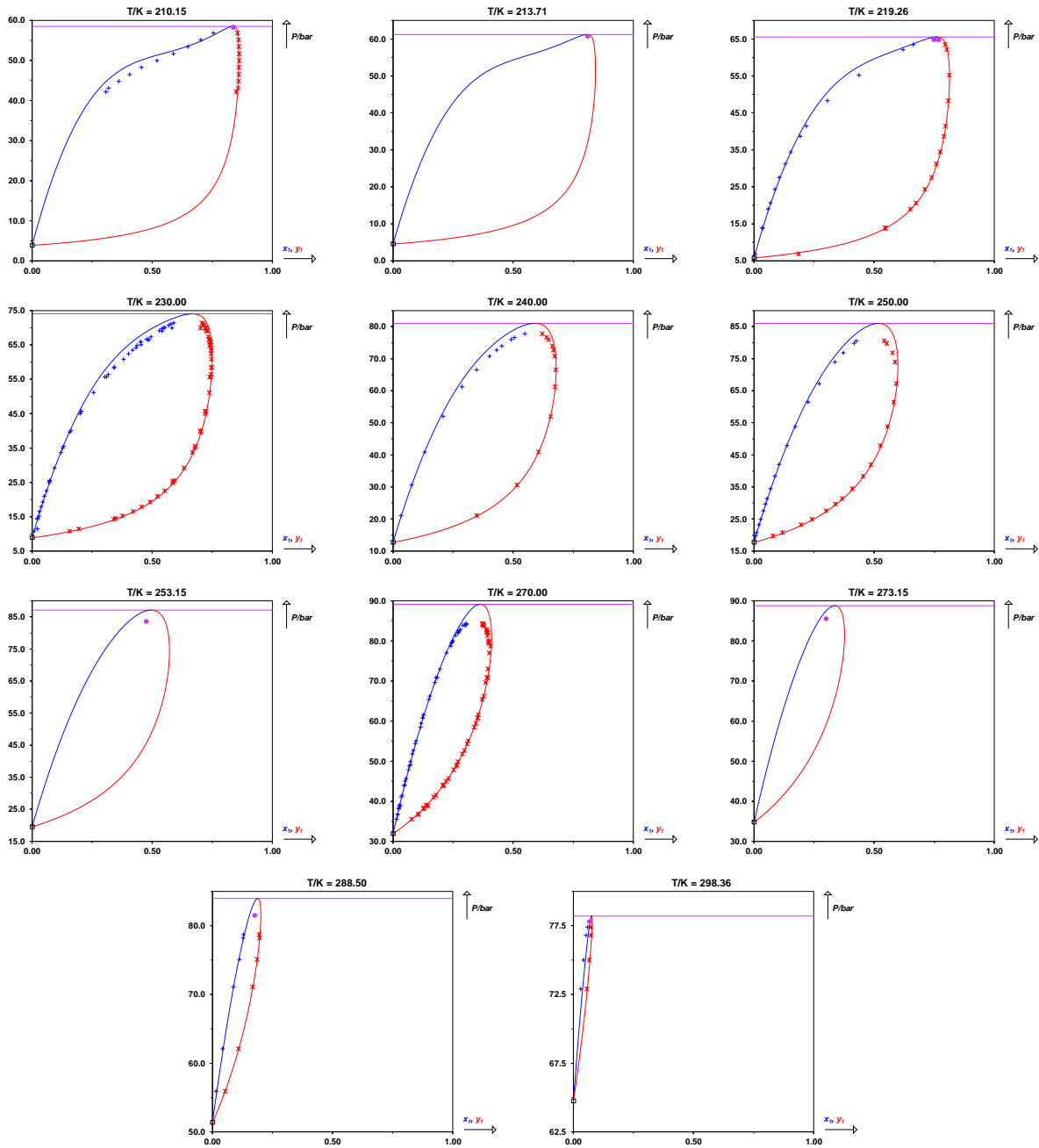
T / K P / bar x_1

193.15 47.37 0.9736

HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



NITROGEN (1) + CARBON DIOXIDE (2)

CAS	7727-37-9	124-38-9
InChiKey	MDFFNEOEWAXZRQ-UHFFFAOYSA-N	CURLTUGMZLYLDI-UHFFFAOYSA-N
T_c / K	126.20	304.21
P_c / bar	34.00	73.83
ω	0.038	0.224

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 124.2$

$B/\text{MPa} = 225.2$

Deviations

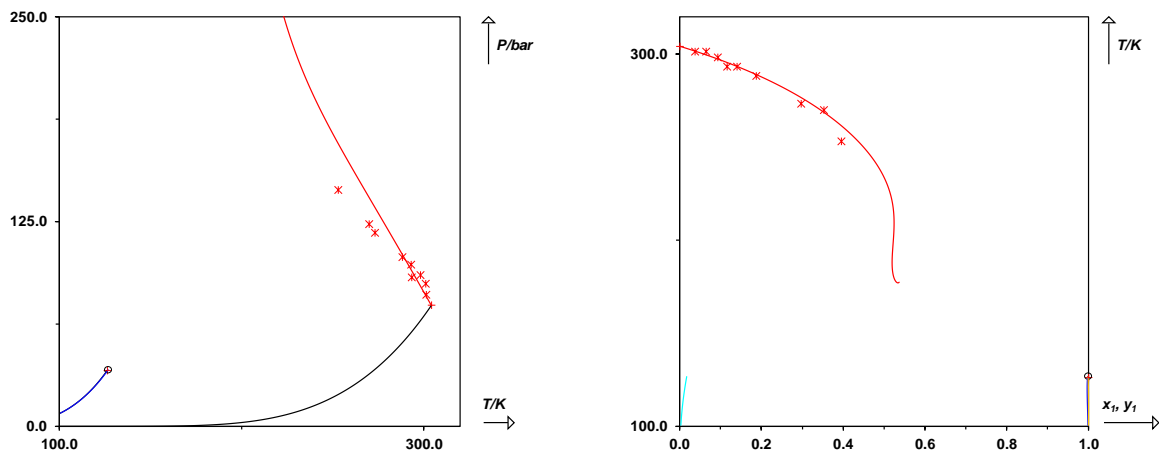
MAPE on $x = 4.9\%$

MAPE on $y = 3.1\%$

MAPE on $x_c = 6.8\%$

MAPE on $P_c = 8.0\%$

MAPE on $h^M = 9.8\%$



-----			20.00	0.0130	0.3186
Isothermal phase equilibrium data			109.30	0.1830	0.6977
-----			130.00	0.2467	0.6692
Brown, T.S. - Sloan, E.D. - Kidnay, A.J., Vapor-liquid equilibria in the nitrogen + carbon dioxide + ethane system, Fluid Phase Equilibria. 51 (1989) 299-313. doi:10.1016/0378-3812(89)80372-3					
T / K = 220.00			Al-Sahhaf, Taher A. - Kidnay, Arthur J. - Sloan, E. Dendy, Liquid + vapor equilibriums in the nitrogen + carbon dioxide + methane system, Industrial & Engineering Chemistry Fundamentals. 22 (1983) 372-380. doi:10.1021/i100012a004		
P / bar	x ₁	y ₁	T / K = 240.00		
13.73	0.0108	0.5174	P / bar	x ₁	y ₁
24.57	0.0269	0.6971	21.00	0.0129	0.3312
59.93	0.0830	0.8150	32.08	0.0307	0.5151
74.85	0.1092	0.8262	40.89	0.0454	0.5890
90.98	0.1338	0.8264	56.74	0.0734	0.6572
119.95	0.1903	0.8080	62.62	0.0838	0.6710
Al-Sahhaf, Taher A. - Kidnay, Arthur J. - Sloan, E. Dendy, Liquid + vapor equilibriums in the nitrogen + carbon dioxide + methane system, Industrial & Engineering Chemistry Fundamentals. 22 (1983) 372-380. doi:10.1021/i100012a004					
T / K = 220.00			72.35		
P / bar	x ₁	y ₁	85.90		
15.09	0.0132	0.5518	99.45		
30.75	0.0362	0.7423	107.28		
45.95	0.0601	0.7974	114.66		
63.13	0.0883	0.8214	122.25		
82.58	0.1209	0.8281	126.59		
111.14	0.1742	0.8165	138.65		
124.32	0.2016	0.8028	144.72		
137.96	0.2324	0.7869	154.24		
155.06	0.2771	0.7516	157.68		
167.06	0.3155	0.7215	161.47		
Brown, T. S. - Sloan, E. D. - Kidnay, A. J., Vapor-liquid equilibria for the ternary system N ₂ + CO ₂ + n-C ₄ H ₁₀ at 250 and 270 K1, International Journal of Thermophysics. 15 (1994) 1211-1219. doi:10.1007/BF01458829					
T / K = 220.00			T / K = 250.00		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
20.00	0.0209	0.6487	60.03	0.0755	0.5652
30.00	0.0363	0.7404	119.97	0.2192	0.6050
40.00	0.0515	0.7824	139.93	0.2980	0.5470
50.00	0.0731	0.8061	Brown, T.S. - Niesen, V.G. - Sloan, E.D. - Kidnay, A.J., Vapor-liquid equilibria for the binary systems of nitrogen, carbon dioxide, and n-butane at temperatures from 220 to 344 K., Fluid Phase Equilibria. 53 (1989) 7-14. doi:10.1016/0378-3812(89)80067-6		
Zhang Zhanzhu - Guo Liping - Yang Xiadong - Knapp, H., Vapor And Liquid Equilibrium For Nitrogen - Ethane - Carbon Dioxide Ternary System, Huagong Xuebao. 50 (1999) 392-398.					
T / K = 220.00			T / K = 250.00		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
20.00	0.0209	0.6487	25.99	0.0136	0.2561
30.00	0.0363	0.7404	36.88	0.0331	0.4239
40.00	0.0515	0.7824	44.89	0.0488	0.5001
50.00	0.0731	0.8061	55.41	0.0664	0.5494
Yucelen, Belgin - Kidnay, Arthur J., Vapor-Liquid Equilibria in the Nitrogen + Carbon Dioxide + Propane System from 240 to 330 K at Pressures to 15 MPa, Journal of Chemical & Engineering Data. 44 (1999) 926-931. doi:10.1021/je980321e					
T / K = 240.00			65.97		
P / bar	x ₁	y ₁	75.32		
20.00	0.0209	0.6487	0.1069		
30.00	0.0363	0.7404	0.6049		
40.00	0.0515	0.7824			
50.00	0.0731	0.8061			

HA-NA systems (BAC = 2)

96.32	0.1532	0.6223	50.76	0.0358	0.2629
111.51	0.1931	0.6163	60.00	0.0530	0.3250
119.36	0.2173	0.6063	119.70	0.2456	0.3822
134.16	0.2708	0.5727			
140.66	0.3008	0.5437			

Al-Sahhaf, Taher A., Vapor—liquid equilibria for the ternary system N₂ + CO₂ + CH₄ at 230 and 250 K, Fluid Phase Equilibria. 55 (1990) 159-172. doi:10.1016/0378-3812(90)85010-8

T / K = 250.00		
P / bar	x ₁	y ₁
89.63	0.1394	0.6142
103.42	0.1767	0.6162

Brown, T.S. - Niesen, V.G. - Sloan, E.D. - Kidnay, A.J., Vapor-liquid equilibria for the binary systems of nitrogen, carbon dioxide, and n-butane at temperatures from 220 to 344 K., Fluid Phase Equilibria. 53 (1989) 7-14. doi:10.1016/0378-3812(89)80067-6

T / K = 270.00		
P / bar	x ₁	y ₁
48.57	0.0316	0.2423
60.84	0.0561	0.3309
76.50	0.0901	0.3942
91.02	0.1279	0.4205

Brown, T.S. - Sloan, E.D. - Kidnay, A.J., Vapor-liquid equilibria in the nitrogen + carbon dioxide + ethane system, Fluid Phase Equilibria. 51 (1989) 299-313. doi:10.1016/0378-3812(89)80372-3

T / K = 270.00		
P / bar	x ₁	y ₁
57.79	0.0498	0.3087
61.82	0.0566	0.3322
71.65	0.0770	0.3747
75.46	0.0861	0.3879
82.89	0.1055	0.4049
84.76	0.1090	0.4095
90.01	0.1230	0.4148
95.86	0.1338	0.4186
101.93	0.1572	0.4192

Yucelen, Belgin - Kidnay, Arthur J., Vapor—Liquid Equilibria in the Nitrogen + Carbon Dioxide + Propane System from 240 to 330 K at Pressures to 15 MPa, Journal of Chemical & Engineering Data. 44 (1999) 926-931. doi:10.1021/je980321e

T / K = 270.00		
P / bar	x ₁	y ₁
35.67	0.0064	0.0759
37.19	0.0088	0.1036

Somait, Fahad A. - Kidnay, Arthur J., Liquid-vapor equilibria at 270.00 K for systems containing nitrogen, methane, and carbon dioxide, Journal of Chemical & Engineering Data. 23 (1978) 301-305. doi:10.1021/je60079a019

T / K = 270.00			
P / bar	x ₁	y ₁	
34.25	0.0040	0.0472	
36.27	0.0078	0.0851	
38.00	0.0108	0.1140	
39.52	0.0135	0.1331	
41.22	0.0168	0.1598	
42.05	0.0182	0.1683	
42.81	0.0197	0.1783	
45.60	0.0250	0.2115	
45.90	0.0263	0.2156	
47.60	0.0289	0.2323	
47.74	0.0292	0.2325	
51.52	0.0368	0.2674	
56.99	0.0476	0.3069	
60.49	0.0545	0.3280	
60.80	0.0560	0.3290	
64.44	0.0630	0.3473	
70.93	0.0778	0.3770	
77.21	0.0921	0.3961	
83.80	0.1080	0.4126	
86.13	0.1142	0.4139	
86.13	0.1142	0.4139	
89.83	0.1231	0.4190	
92.92	0.1319	0.4173	
96.26	0.1430	0.4210	
96.26	0.1430	0.4210	
102.04	0.1585	0.4188	
107.14	0.1769	0.4134	
110.53	0.1904	0.4094	
111.46	0.1950	0.4080	
112.52	0.1986	0.4061	
115.49	0.2142	0.3986	
119.48	0.2486	0.3762	
120.24	0.2454	0.3720	
120.73	0.2505	0.3664	
121.35	0.2556	0.3640	
123.41	0.3530	0.3530	CRIT

Yorizane, M. - Yoshimura, S. - Masuoka, H., Vapor liquid equilibrium at high pressures. N₂-CO₂, H₂-CO₂ systems,

Kagaku Kogaku. 34 (1970) 953-957.
doi:10.1252/kakoronbunshu1953.34.953

T / K = 273.15

P / bar	x_1	y_1
40.53	0.0110	0.0910
50.66	0.0310	0.2150
60.80	0.0510	0.3000
70.93	0.0710	0.3470
91.19	0.1260	0.3920
101.33	0.1580	0.3970
111.46	0.2000	0.3900
116.52	0.2510	0.3560
117.54	0.2720	0.3380
118.25	0.2970	0.2970

CRIT

Zenner, G.H. - Dana, L.I., Liquid-vapor equilibrium compositions of carbon dioxideoxygen-nitrogen mixtures, Chem. Eng. Progr. Symp. Ser. 59 (1963) 36-41.

T / K = 273.15

P / bar	x_1	y_1
48.33	0.0265	0.1980
60.29	0.0512	0.2920
60.39	0.0521	0.2885
63.13	0.0580	0.3100
79.95	0.0952	0.3730
95.85	0.1408	0.3960
109.73	0.1923	0.3845
116.62	0.2280	0.3540
118.55	0.2975	0.3045

Kaminishi, G.I. - Toriumi, T., Gas-liquid equilibrium under high pressures. VI. Vapor-liquid phase equilibrium in the CO₂-H₂, CO₂-N₂, and CO₂-O₂ systems, Kogyo Kagaku Zasshi. 69 (1966) 175-178.

T / K = 288.15

P / bar	x_1	y_1
74.17	0.0510	0.1750
84.40	0.0830	0.2020

Krichevskii, I.R. - Khazanova, N.E. - Lesnevskaya, L.S. - Sandalova, L.Yu., Liquid-gas equilibrium in the nitrogen-carbon dioxide system under elevated pressures, Khim. Promst. Moscow. (1962) 169-171.

T / K = 288.15

P / bar	x_1	y_1
60.80	0.0250	0.0900
70.93	0.0500	0.1580
81.06	0.0740	0.1950
91.19	0.1020	0.2100
101.33	0.1610	0.2050
103.35	0.1870	0.1870

CRIT

Xu, Nanping - Dong, Junhang - Wang, Yanru - Shi, Jun, High pressure vapor liquid equilibria at 293 K for systems containing nitrogen, methane and carbon dioxide, Fluid Phase Equilibria. 81 (1992) 175-186. doi:10.1016/0378-3812(92)85150-7

T / K = 293.30

P / bar	x_1	y_1
60.00	0.0050	0.0230
69.80	0.0290	0.0880
74.20	0.0410	0.1110
81.00	0.0610	0.1360
87.00	0.0760	0.1370
89.00	0.0860	0.1330
90.30	0.0960	0.1290
91.10	0.1160	0.1160

CRIT

Bian, Baigui - Wang, Yanru - Shi, Jun - Zhao, Ensheng - Lu, Benjamin C.-Y., Simultaneous determination of vapor-liquid equilibrium and molar volumes for coexisting phases up to the critical temperature with a static method, Fluid Phase Equilibria. 90 (1993) 177-187. doi:10.1016/0378-3812(93)85012-B

T / K = 301.30

P / bar	x_1	y_1
72.20	0.0069	0.0152
73.30	0.0101	0.0206
76.10	0.0182	0.0326
79.00	0.0258	0.0390
80.10	0.0348	0.0389
80.50	0.0379	0.0379

CRIT

Enthalpy of mixing

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 283.15
P / bar = 10.13

$h^M / \text{J.mol}^{-1}$	z_1
21.00	0.1000
37.00	0.2000
47.00	0.3000
54.00	0.4000
59.00	0.5000
53.00	0.6000
44.00	0.7000
34.00	0.8000
18.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 283.15

P / bar = 43.57

$h^M / \text{J.mol}^{-1}$	z_1
400.00	0.1000
530.00	0.2000
602.00	0.3000
620.00	0.4000
594.00	0.5000
543.00	0.6000
450.00	0.7000
335.00	0.8000
190.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 293.15

P / bar = 40.53

$h^M / \text{J.mol}^{-1}$	z_1
185.00	0.1000
286.00	0.2000
346.00	0.3000
371.00	0.4000
363.00	0.5000
328.00	0.6000
270.00	0.7000
205.00	0.8000
112.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 305.15

P / bar = 10.13

$h^M / \text{J.mol}^{-1}$	z_1
16.00	0.1000
30.00	0.2000
39.00	0.3000
44.00	0.4000
47.00	0.5000
43.00	0.6000
35.00	0.7000
26.00	0.8000
16.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 305.15

P / bar = 50.66

$h^M / \text{J.mol}^{-1}$	z_1
234.00	0.1000
389.00	0.2000
452.00	0.3000
460.00	0.4000
439.00	0.5000
396.00	0.6000
329.00	0.7000
240.00	0.8000
133.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 305.15

P / bar = 86.13

$h^M / \text{J.mol}^{-1}$	z_1
3980.0	0.1000
4340.0	0.2000
4170.0	0.3000
3740.0	0.4000
3240.0	0.5000
2705.0	0.6000
2085.0	0.7000
1405.0	0.8000
725.00	0.9000

Hejmadi, Arun V. - Katz, Donald L. - Powers, John E., Experimental determination of the enthalpy of mixing of N + CO₂ under pressure, The Journal of Chemical Thermodynamics. 3 (1971) 483-496. doi:10.1016/S0021-9614(71)80030-7

T / K = 313.15

P / bar = 65.49

$h^M / \text{J.mol}^{-1}$	z_1
627.20	0.2200
705.50	0.3580
662.70	0.5160
444.00	0.7320

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 313.15

HA-NA systems (BAC = 2)

P / bar = 40.53

$h^M / \text{J.mol}^{-1}$	z_1
111.00	0.1000
187.00	0.2000
235.00	0.3000
256.00	0.4000
255.00	0.5000
230.00	0.6000
189.00	0.7000
130.00	0.8000
69.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 313.15

P / bar = 81.06

$h^M / \text{J.mol}^{-1}$	z_1
1021.0	0.1000
1292.0	0.2000
1416.0	0.3000
1370.0	0.4000
1243.0	0.5000
1097.0	0.6000
904.00	0.7000
668.00	0.8000
364.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 313.15

P / bar = 121.59

$h^M / \text{J.mol}^{-1}$	z_1
1883.0	0.1000
2940.0	0.2000
3291.0	0.3000
3244.0	0.4000
2879.0	0.5000
2391.0	0.6000
1787.0	0.7000
1138.0	0.8000
541.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 323.15

P / bar = 40.53

$h^M / \text{J.mol}^{-1}$	z_1
93.00	0.1000
156.00	0.2000
200.00	0.3000
225.00	0.4000
220.00	0.5000
195.00	0.6000
160.00	0.7000
115.00	0.8000
60.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 323.15

P / bar = 81.06

$h^M / \text{J.mol}^{-1}$	z_1
490.00	0.1000
720.00	0.2000
870.00	0.3000
890.00	0.4000
845.00	0.5000
760.00	0.6000
620.00	0.7000
465.00	0.8000
257.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 333.15

P / bar = 20.26

$h^M / \text{J.mol}^{-1}$	z_1
29.00	0.1000
48.00	0.2000
66.00	0.3000
76.00	0.4000
79.00	0.5000
76.00	0.6000
62.00	0.7000
45.00	0.8000
23.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 333.15

HA-NA systems (BAC = 2)

P / bar = 60.79

$h^M / \text{J.mol}^{-1}$	z_1
171.00	0.1000
272.00	0.2000
340.00	0.3000
370.00	0.4000
360.00	0.5000
325.00	0.6000
275.00	0.7000
200.00	0.8000
115.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 333.15

P / bar = 101.32

$h^M / \text{J.mol}^{-1}$	z_1
712.00	0.1000
1042.0	0.2000
1190.0	0.3000
1210.0	0.4000
1100.0	0.5000
955.00	0.6000
780.00	0.7000
556.00	0.8000
295.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 343.15

P / bar = 30.40

$h^M / \text{J.mol}^{-1}$	z_1
44.00	0.1000
76.00	0.2000
100.00	0.3000
113.00	0.4000
115.00	0.5000
110.00	0.6000
92.00	0.7000
68.00	0.8000
37.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 343.15

P / bar = 70.93

$h^M / \text{J.mol}^{-1}$	z_1
187.00	0.1000
310.00	0.2000
380.00	0.3000
415.00	0.4000
400.00	0.5000
350.00	0.6000
290.00	0.7000
215.00	0.8000
115.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 353.15

P / bar = 10.13

$h^M / \text{J.mol}^{-1}$	z_1
9.000	0.1000
18.00	0.2000
24.00	0.3000
30.00	0.4000
32.00	0.5000
30.00	0.6000
24.00	0.7000
18.00	0.8000
9.000	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 353.15

P / bar = 50.66

$h^M / \text{J.mol}^{-1}$	z_1
82.00	0.1000
135.00	0.2000
176.00	0.3000
198.00	0.4000
203.00	0.5000
190.00	0.6000
164.00	0.7000
125.00	0.8000
67.00	0.9000

Lee, Jong Il - Mather, Alan E., Excess enthalpy of gaseous mixtures of nitrogen and carbon dioxide, Journal of Chemical & Engineering Data. 17 (1972) 189-192. doi:10.1021/je60053a042

T / K = 353.15

P / bar =	91.19
$h^M / \text{J.mol}^{-1}$	z_1
262.00	0.1000
412.00	0.2000
500.00	0.3000
540.00	0.4000
530.00	0.5000
470.00	0.6000
390.00	0.7000
285.00	0.8000
156.00	0.9000

Critical point

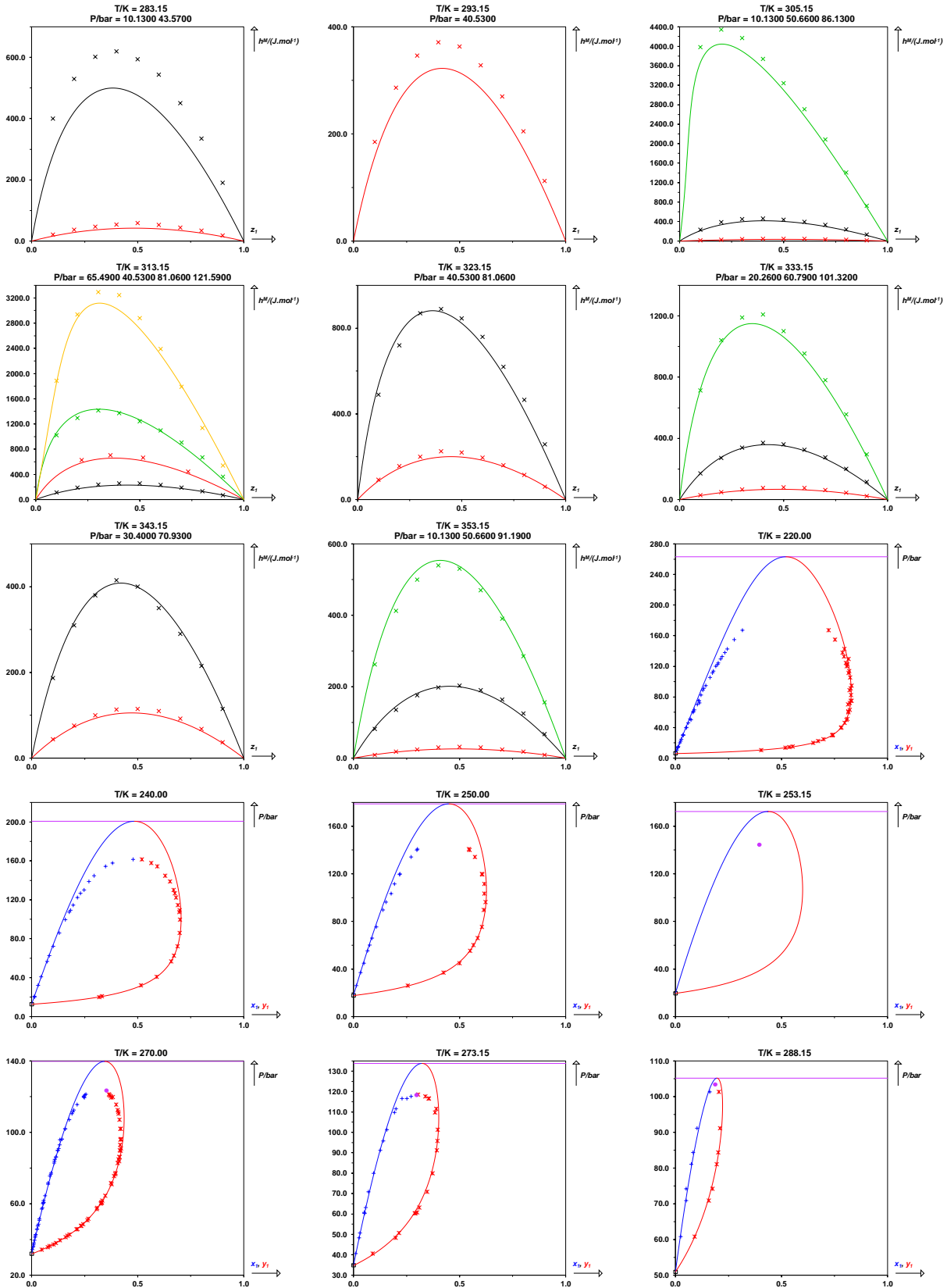
Arai, Yasuhiko - Kaminishi, Gen-Ichi - Saito, Shozaburo,
 The Experimental Determination Of The P-V-T-X Relations
 For The Carbon Dioxide-Nitrogen And The Carbon
 Dioxide-Methane Systems, Journal of Chemical
 Engineering of Japan. 4 (1971) 113-122.
 doi:10.1252/jcej.4.113

T / K	P / bar	x_1
253.15	144.39	0.3950

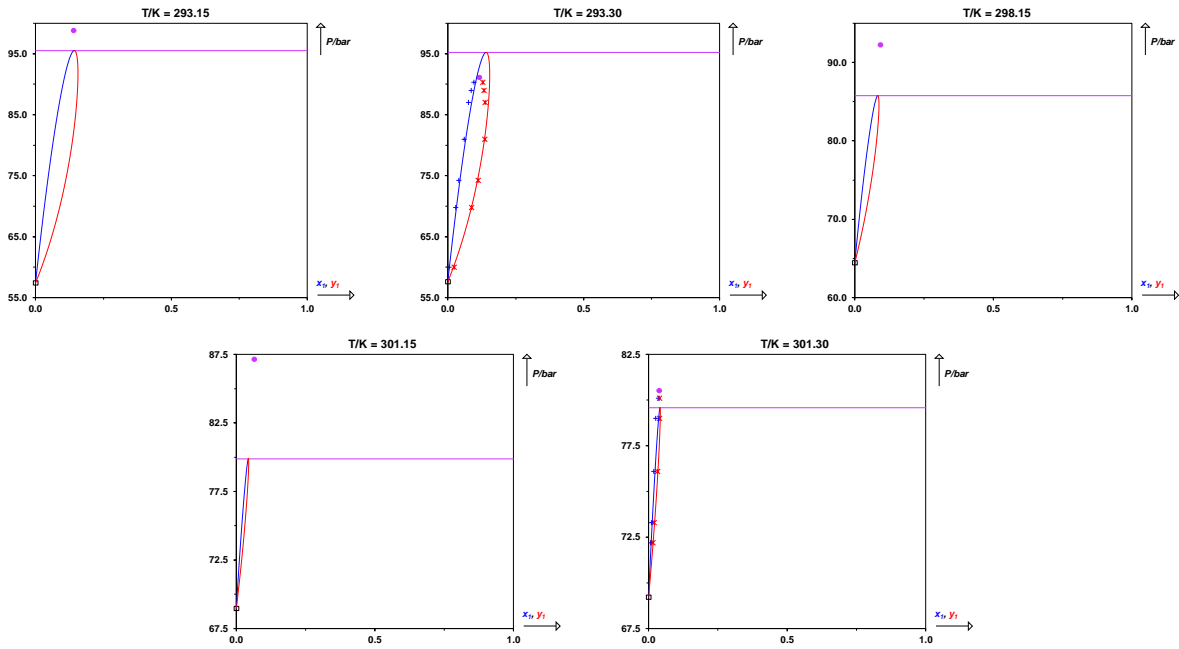
Krichevskii, I.R. - Khazanova, N.E. - Lesnevskaya, L.S. -
 Sandalova, L.Yu., Liquid-gas equilibrium in the nitrogen-
 carbon dioxide system under elevated pressures, Khim.
 Promst. Moscow. (1962) 169-171.

T / K	P / bar	x_1
293.15	98.79	0.1400
298.15	92.21	0.0930
301.15	87.14	0.0640

HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



ETHYLENE (1) + CARBON DIOXIDE (2)

CAS	74-85-1	124-38-9
InChiKey	VGGSQFUCUMXWEO-UHFFFAOYSA-N	CURLTUGMZLYLDI-UHFFFAOYSA-N
T_c / K	282.34	304.21
P_c / bar	50.41	73.83
ω	0.086	0.224

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 71.73$

$B/\text{MPa} = 108.5$

Deviations

MAPE on $x = 19\%$

MAPE on $y = 19\%$

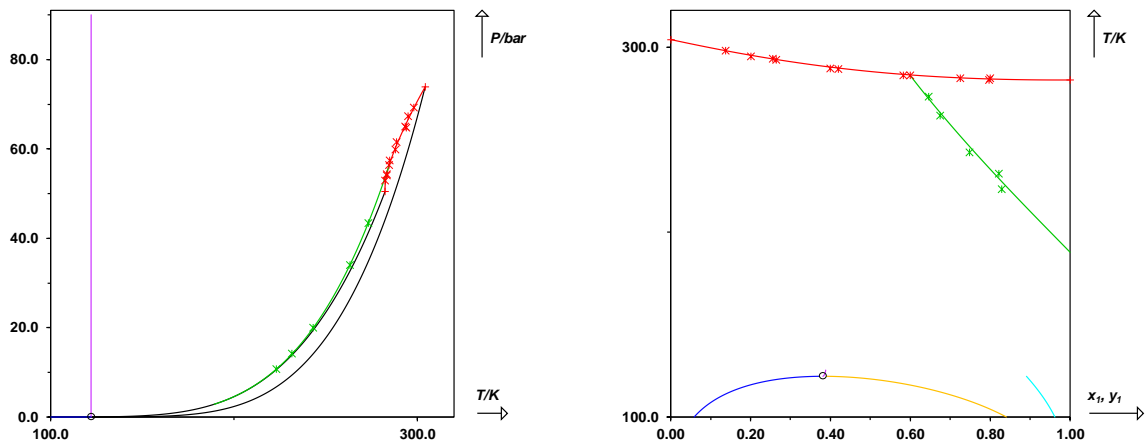
MAPE on $x_c = 8.5\%$

MAPE on $P_c = 0.86\%$

MAPE on $x_{az} = 3.1\%$

MAPE on $P_{az} = 0.20\%$

MAPE on $h^M = 14\%$



-----				19.26	0.4593	0.5152	
Isothermal phase equilibrium data				19.94	0.7432	0.7382	
-----				19.94	0.7480	0.7480	AZEO
Mollerup, Jørgen, Vapour/liquid equilibrium in ethylene + carbon dioxide and ethane + carbon dioxide, Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases. 71 (1975) doi:10.1039/f19757102351				19.59	0.9254	0.9156	
T / K = 223.15				Nagahama, Kunio - Konishi, Hitoshi - Hoshino, Daisuke - Hirata, Mitsuho, Binary Vapor-Liquid Equilibria Of Carbon Dioxide-Light Hydrocarbons At Low Temperature, Journal of Chemical Engineering of Japan. 7 (1974) 323-328. doi:10.1252/jcej.7.323			
P / bar	x ₁	y ₁		T / K = 252.95			
7.321	0.0365	0.0946		P / bar	x ₁	y ₁	
8.028	0.0985	0.2088		20.92	0.0600	0.1050	
8.828	0.1941	0.3354		22.04	0.1130	0.1800	
9.494	0.3018	0.4360		23.71	0.2330	0.3150	
9.936	0.4029	0.5120		24.62	0.3240	0.3960	
10.35	0.5305	0.6035		25.59	0.4530	0.5010	
10.54	0.6093	0.6573		25.69	0.4940	0.5390	
10.69	0.7149	0.7363		25.94	0.5340	0.5670	
10.74	0.8280	0.8280	AZEO	26.14	0.6380	0.6530	
10.73	0.8641	0.8619		25.99	0.8250	0.8170	
10.65	0.9633	0.9604		25.84	0.8730	0.8640	
Nagahama, Kunio - Konishi, Hitoshi - Hoshino, Daisuke - Hirata, Mitsuho, Binary Vapor-Liquid Equilibria Of Carbon Dioxide-Light Hydrocarbons At Low Temperature, Journal of Chemical Engineering of Japan. 7 (1974) 323-328. doi:10.1252/jcej.7.323				25.48	0.9290	0.9280	
T / K = 231.55				Bae, Hyo Kwang - Nagahama, Kunio - Hirata, Mitsuho, Isothermal vapor-liquid equilibriums for the ethylene-carbon dioxide system at high pressure, Journal of Chemical & Engineering Data. 27 (1982) 25-27. doi:10.1021/je00027a007			
P / bar	x ₁	y ₁		T / K = 263.14			
10.44	0.0520	0.1150		P / bar	x ₁	y ₁	
10.94	0.0860	0.1810		27.82	0.0490	0.0840	
11.86	0.1670	0.2800		29.21	0.1060	0.1660	
12.62	0.2650	0.3850		30.79	0.2040	0.2680	
13.32	0.4280	0.4980		32.23	0.3100	0.3650	
13.68	0.4900	0.5620		33.02	0.4050	0.4440	
13.98	0.5870	0.6350		33.53	0.4850	0.5240	
14.14	0.7250	0.7350		33.96	0.6000	0.6130	
14.19	0.8210	0.8210	AZEO	33.98	0.6690	0.6700	
14.19	0.8240	0.8220		34.00	0.6750	0.6750	AZEO
14.03	0.9210	0.9160		33.89	0.7640	0.7500	
Mollerup, Jørgen, Vapour/liquid equilibrium in ethylene + carbon dioxide and ethane + carbon dioxide, Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases. 71 (1975) doi:10.1039/f19757102351				33.54	0.8370	0.8250	
T / K = 243.15				Bae, Hyo Kwang - Nagahama, Kunio - Hirata, Mitsuho, Isothermal vapor-liquid equilibriums for the ethylene-carbon dioxide system at high pressure, Journal of Chemical & Engineering Data. 27 (1982) 25-27. doi:10.1021/je00027a007			
P / bar	x ₁	y ₁		T / K = 273.16			
15.88	0.0872	0.1563		P / bar	x ₁	y ₁	
17.17	0.1807	0.2775		36.00	0.0390	0.0560	
17.95	0.2596	0.3528		37.36	0.0890	0.1250	
18.73	0.3650	0.4391					

HA-NA systems (BAC = 2)

38.86	0.1550	0.2020		Dioxide-Ethylene. VI. Carbon Dioxide-Propylene, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences. 209 (1951) 1-14. doi:10.1098/rspa.1951.0183
40.21	0.2260	0.2730		
41.46	0.3160	0.3550		
42.63	0.4330	0.4580		
43.19	0.5260	0.5390		P / bar = 30.40
43.38	0.5940	0.5980		T / K x ₁
43.40	0.6460	0.6460	AZEO	264.97 0.0940
43.42	0.6670	0.6660		262.47 0.2113
43.40	0.6840	0.6810		260.86 0.3004
43.15	0.7540	0.7510		259.78 0.4025
42.75	0.8170	0.8090		259.12 0.5015
42.21	0.8840	0.8780		258.73 0.6327
41.42	0.9520	0.9500		258.57 0.7059
				258.83 0.7904
				258.98 0.8470
				259.20 0.8933

Bae, Hyo Kwang - Nagahama, Kunio - Hirata, Mitsuho, Isothermal vapor-liquid equilibriums for the ethylene-carbon dioxide system at high pressure, Journal of Chemical & Engineering Data. 27 (1982) 25-27. doi:10.1021/je00027a007

T / K = 283.16

P / bar	x ₁	y ₁	
46.98	0.0600	0.0810	
48.27	0.1050	0.1390	
49.86	0.1590	0.2060	
51.86	0.2610	0.2970	
52.99	0.3380	0.3670	
54.10	0.4530	0.4660	
54.51	0.5350	0.5390	
54.79	0.6170	0.6180	
54.49	0.7070	0.7050	
54.41	0.7200	0.7190	
54.38	0.7250	0.7250	CRIT

Bae, Hyo Kwang - Nagahama, Kunio - Hirata, Mitsuho, Isothermal vapor-liquid equilibriums for the ethylene-carbon dioxide system at high pressure, Journal of Chemical & Engineering Data. 27 (1982) 25-27. doi:10.1021/je00027a007

T / K = 298.15

P / bar	x ₁	y ₁	
65.47	0.0330	0.0400	
66.98	0.0710	0.0810	
68.56	0.1130	0.1230	
69.01	0.1300	0.1350	
69.18	0.1370	0.1370	CRIT

Isobaric phase equilibrium data

Haselden, G. G. - Newitt, D. M. - Shah, S. M., Two-Phase Equilibrium in Binary and Ternary Systems. V. Carbon

Haselden, G. G. - Newitt, D. M. - Shah, S. M., Two-Phase Equilibrium in Binary and Ternary Systems. V. Carbon Dioxide-Ethylene. VI. Carbon Dioxide-Propylene, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences. 209 (1951) 1-14. doi:10.1098/rspa.1951.0183

P / bar = 30.40

T / K	y ₁
266.30	0.0940
264.37	0.2113
262.62	0.3004
261.01	0.4025
259.81	0.5015
258.95	0.6327
258.66	0.7059
259.08	0.7904
259.38	0.8470
259.75	0.8933

Haselden, G. G. - Newitt, D. M. - Shah, S. M., Two-Phase Equilibrium in Binary and Ternary Systems. V. Carbon Dioxide-Ethylene. VI. Carbon Dioxide-Propylene, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences. 209 (1951) 1-14. doi:10.1098/rspa.1951.0183

P / bar = 40.53

T / K	x ₁
275.96	0.0940
273.63	0.2113
272.05	0.3004
271.15	0.4025
270.40	0.5015
270.11	0.6327
270.03	0.7059
270.35	0.7904

270.67 0.8470
270.92 0.8933

Haselden, G. G. - Newitt, D. M. - Shah, S. M., Two-Phase Equilibrium in Binary and Ternary Systems. V. Carbon Dioxide-Ethylene. VI. Carbon Dioxide-Propylene, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences. 209 (1951) 1-14. doi:10.1098/rspa.1951.0183

P / bar = 40.53

T / K y_1
276.78 0.0940
274.84 0.2113
272.98 0.3004
271.78 0.4025
270.78 0.5015
270.19 0.6327
270.13 0.7059
270.51 0.7904
270.95 0.8470
271.35 0.8933

Haselden, G. G. - Newitt, D. M. - Shah, S. M., Two-Phase Equilibrium in Binary and Ternary Systems. V. Carbon Dioxide-Ethylene. VI. Carbon Dioxide-Propylene, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences. 209 (1951) 1-14. doi:10.1098/rspa.1951.0183

P / bar = 45.60

T / K x_1
280.67 0.0940
278.37 0.2113
276.83 0.3004
275.75 0.4025
275.23 0.5015
274.93 0.6327
274.97 0.7059
275.40 0.7904
275.77 0.8470
276.12 0.8933

Haselden, G. G. - Newitt, D. M. - Shah, S. M., Two-Phase Equilibrium in Binary and Ternary Systems. V. Carbon Dioxide-Ethylene. VI. Carbon Dioxide-Propylene, Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences. 209 (1951) 1-14. doi:10.1098/rspa.1951.0183

P / bar = 45.60

T / K y_1
281.70 0.0940
279.36 0.2113
277.65 0.3004

276.43 0.4025
275.53 0.5015
274.95 0.6327
275.05 0.7059
275.53 0.7904
276.00 0.8470
276.38 0.8933

Enthalpy of mixing

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 260.95

P / bar = 35.00

$h^M / J.mol^{-1}$ z_1
562.00 0.2370
685.00 0.3160
779.00 0.3960
793.00 0.4750
805.00 0.5170
800.00 0.5570
783.00 0.5950
716.00 0.6380
643.00 0.6780

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 276.65

P / bar = 110.00

$h^M / J.mol^{-1}$ z_1
126.00 0.0520
246.00 0.1010
377.00 0.1510
499.00 0.2010
584.00 0.2500
631.00 0.3010
688.00 0.3520
722.00 0.4020
734.00 0.4520
734.00 0.5030
720.00 0.5530
700.00 0.6610
645.00 0.6510
602.00 0.7030
338.00 0.8510

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 276.65

P / bar = 47.50

$h^M / \text{J.mol}^{-1}$	z_1
102.00	0.0410
217.00	0.0800
332.00	0.1200
429.00	0.1590
500.00	0.1980
590.00	0.2380
646.00	0.2770
720.00	0.3180
780.00	0.3570
811.00	0.3980
855.00	0.4370
858.00	0.4770
886.00	0.5160
885.00	0.5530
853.00	0.5970
851.00	0.6400
822.00	0.6800
691.00	0.7610
604.00	0.8010
507.00	0.8420

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 285.85

P / bar = 110.00

$h^M / \text{J.mol}^{-1}$	z_1
98.00	0.0490
295.00	0.1000
399.00	0.1530
503.00	0.2010
600.00	0.2510
682.00	0.3030
750.00	0.4020
741.00	0.5010
730.00	0.5510
703.00	0.5950
660.00	0.6380
620.00	0.6900
555.00	0.7400
448.00	0.8020
361.00	0.8520

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 285.85

P / bar = 62.50

$h^M / \text{J.mol}^{-1}$	z_1
410.00	0.1610
547.00	0.1990
648.00	0.2400
737.00	0.2790
829.00	0.3200
892.00	0.3590
957.00	0.4000
1007.0	0.4390
1053.0	0.4790
1059.0	0.5220
1074.0	0.5610
1055.0	0.5990
1024.0	0.6420
936.00	0.6820
820.00	0.7190
703.00	0.7620
595.00	0.8020
490.00	0.8430

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 300.45

P / bar = 110.00

$h^M / \text{J.mol}^{-1}$	z_1
139.00	0.0520
300.00	0.1010
452.00	0.1510
561.00	0.2010
659.00	0.2500
726.00	0.3010
812.00	0.3520
847.00	0.4020
830.00	0.4510
831.00	0.5030
830.00	0.5530
792.00	0.6010
730.00	0.6510
665.00	0.7030
592.00	0.7530
473.00	0.8010
373.00	0.8510
229.00	0.9020

103.00 0.9510

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 300.45
P / bar = 75.00
 $h^M / J.mol^{-1}$
 z_1

210.00 0.0420

415.00 0.0810

675.00 0.1220

954.00 0.1610

1295.0 0.2010

1639.0 0.2410

1925.0 0.2810

2148.0 0.3210

2249.0 0.3610

2309.0 0.4020

2286.0 0.4410

2200.0 0.4810

2131.0 0.5230

2043.0 0.5630

1895.0 0.6010

1762.0 0.6430

1586.0 0.6830

1422.0 0.7210

1242.0 0.7630

1021.0 0.8030

768.00 0.8440

600.00 0.8810

328.00 0.9250

131.00 0.9640

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 300.45
P / bar = 65.70
 $h^M / J.mol^{-1}$
 z_1

247.00 0.1010

340.00 0.1500

418.00 0.2010

471.00 0.2500

539.00 0.3310

582.00 0.3480

610.00 0.3980

630.00 0.4990

631.00 0.5490

585.00 0.6520

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 305.75
P / bar = 80.50
 $h^M / J.mol^{-1}$
 z_1

887.00 0.0720

1254.0 0.0840

1764.0 0.1250

2028.0 0.1670

2176.0 0.2090

2223.0 0.2500

2340.0 0.2930

2204.0 0.3340

2194.0 0.3740

2157.0 0.4150

2076.0 0.4580

1943.0 0.5000

1833.0 0.5420

1681.0 0.5830

1580.0 0.6250

1360.0 0.6680

1304.0 0.7090

991.00 0.7510

904.00 0.7950

613.00 0.8350

Wormald, C.J. - Eyears, J.M., Excess molar enthalpies of (carbon dioxide + ethene) in the liquid and near-critical regions, The Journal of Chemical Thermodynamics. 33 (2001) 775-786. doi:10.1006/jcht.2000.0778

T / K = 306.62
P / bar = 110.00
 $h^M / J.mol^{-1}$
 z_1

155.00 0.0500

337.00 0.1010

599.00 0.1530

701.00 0.2010

799.00 0.2510

898.00 0.3010

968.00 0.3500

989.00 0.4010

981.00 0.5010

940.00 0.5530

880.00 0.6010

824.00 0.6520

739.00 0.7020

641.00 0.7510

544.00 0.8010

442.00 0.8520
 305.00 0.9010

Critical point

Khazanova, N.E. - Sominskaya, E.E. - Zakharova, A.V. -
 Rozovskii, M.B. - Nechimailo, N.L., Systems with
 azeotropism at high pressures. X. Phase and volume
 relations in the ethylene-carbon dioxide system, Zh. Fiz.
 Khim. 53 (1979) 1594-1597.

T / K	P / bar	x_1
282.39	52.89	0.7970
284.65	56.39	0.5820
288.09	59.83	0.4190
293.95	64.75	0.2560

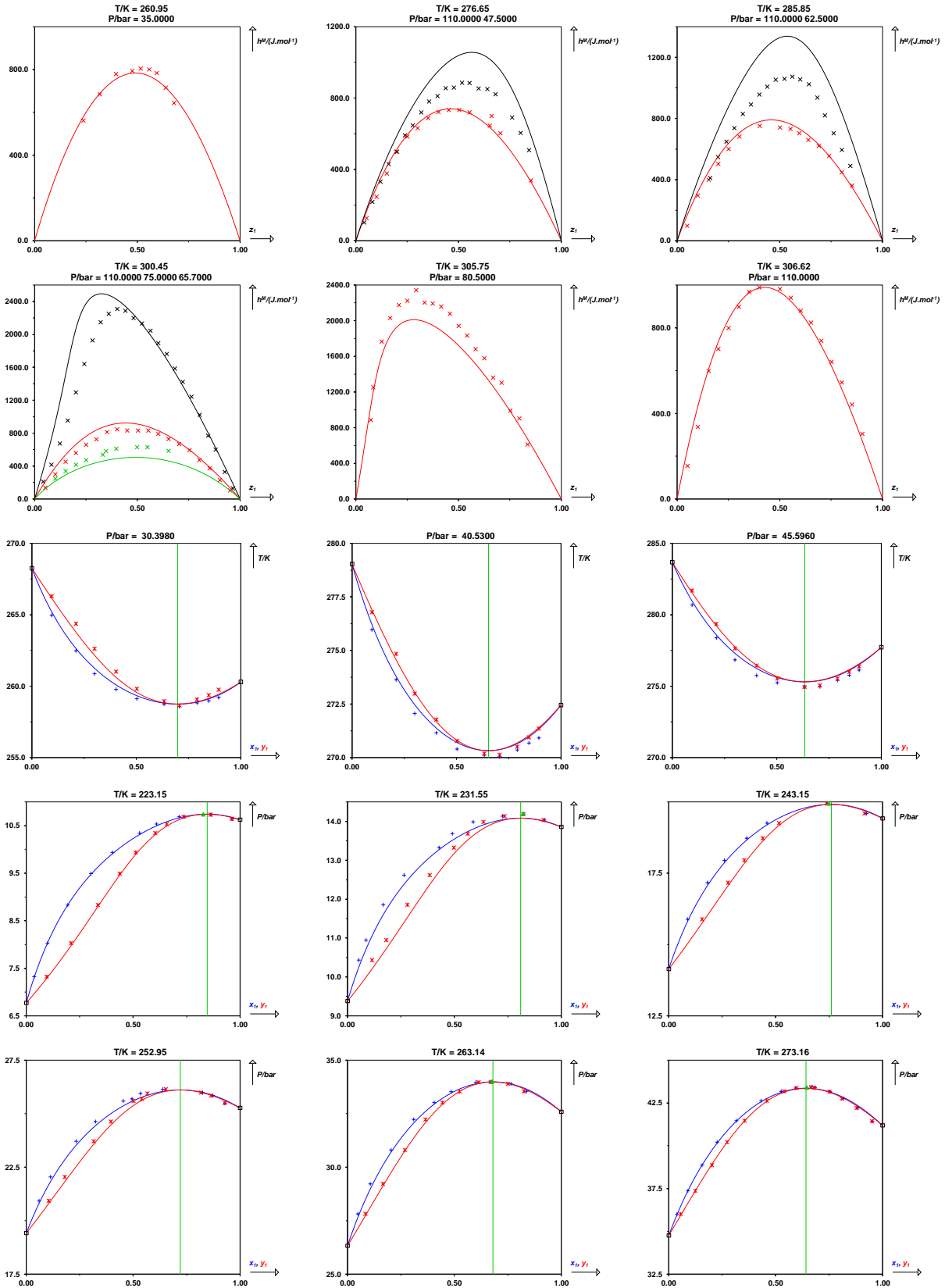
Rowlinson, J.S. - Sutton, J.R. - Weston, J.F., Liquid-vapor
 equilibrium in the ternary system carbon dioxide-nitrous
 oxide-ethylene, Proceedings. (1958) 10-14.

T / K	P / bar	x_1
283.15	54.11	0.8000
284.75	57.35	0.6000
288.55	61.50	0.4000
294.95	67.28	0.2000

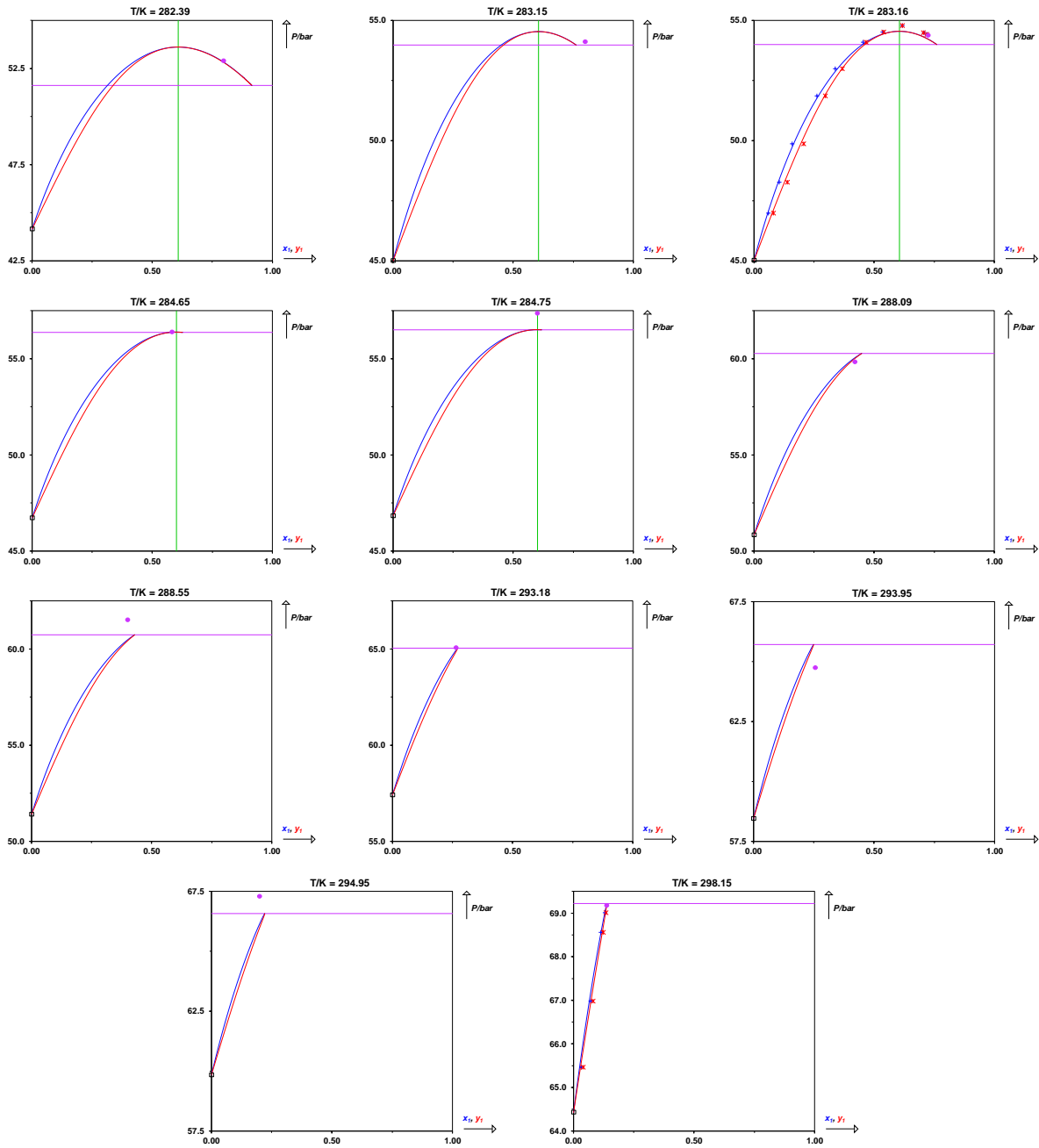
Bae, Hyo Kwang - Nagahama, Kunio - Hirata, Mitsuho,
 Isothermal vapor-liquid equilibriums for the ethylene-
 carbon dioxide system at high pressure, Journal of
 Chemical & Engineering Data. 27 (1982) 25-27.
 doi:10.1021/je00027a007

T / K	P / bar	x_1
293.18	65.05	0.2640

HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



CARBON DIOXIDE (1) + ETHANE (2)

CAS	124-38-9	74-84-0
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	OTMSDBZUPAUEDD-UHFFFAOYSA-N
T_c / K	304.21	305.32
P_c / bar	73.83	48.72
ω	0.224	0.099

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 137.8$

$B/\text{MPa} = 233.9$

Deviations

MAPE on $x = 6.2\%$

MAPE on $y = 3.4\%$

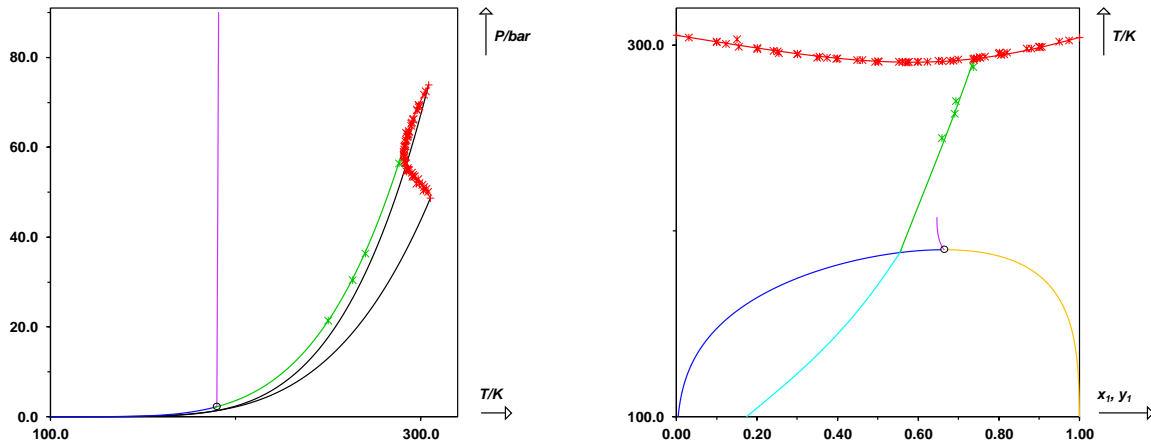
MAPE on $x_c = 4.9\%$

MAPE on $P_c = 0.63\%$

MAPE on $x_{az} = 1.4\%$

MAPE on $P_{az} = 0.40\%$

MAPE on $h^M = 17\%$



Isothermal phase equilibrium data			T / K =	213.00
P / bar	x ₁	y ₁	P / bar	x ₁ y ₁
5.640			5.640	0.8678 0.7327
5.760			5.760	0.8317 0.7055
5.940			5.940	0.7601 0.6588
6.040			6.040	0.6982 0.6319
6.100			6.100	0.6503 0.6022
6.130			6.130	0.6089 0.5911
6.160			6.160	0.5557 0.5800
6.130			6.130	0.4789 0.5531
6.070			6.070	0.4282 0.5302
5.830			5.830	0.3075 0.4770
5.320			5.320	0.1706 0.3725
5.080			5.080	0.1306 0.3185
4.710			4.710	0.0837 0.2401
4.320			4.320	0.0442 0.1458
Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002			Brown, T.S. - Kidnay, A.J. - Sloan, E.D., Vapor—liquid equilibria in the carbon dioxide-ethane system, Fluid Phase Equilibria. 40 (1988) 169-184. doi:10.1016/0378-3812(88)80028-1	
Isothermal phase equilibrium data			T / K =	220.00
P / bar	x ₁	y ₁	P / bar	x ₁ y ₁
5.380	0.3738	0.5104	5.220	0.0150 0.0706
4.650	0.3364	0.4937	5.480	0.0317 0.1239
4.620	0.3111	0.4786	5.790	0.0532 0.1846
4.610	0.3028	0.4759	6.130	0.0812 0.2418
4.590	0.2923	0.4699	6.600	0.1332 0.3178
4.560	0.2744	0.4592	6.860	0.1608 0.3592
4.440	0.2285	0.4292	7.200	0.2186 0.4120
4.190	0.1638	0.3714	7.420	0.2564 0.4454
3.720	0.0778	0.2624	7.650	0.3190 0.4850
Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002			Brown, T.S. - Kidnay, A.J. - Sloan, E.D., Vapor—liquid equilibria in the carbon dioxide-ethane system, Fluid Phase Equilibria. 40 (1988) 169-184. doi:10.1016/0378-3812(88)80028-1	
Isothermal phase equilibrium data			T / K =	230.00
P / bar	x ₁	y ₁	P / bar	x ₁ y ₁
5.380	0.7093	0.6213	7.990	0.0485 0.1513
5.400	0.6963	0.6172	8.330	0.0681 0.1910
5.410	0.6844	0.6149	8.410	0.0745 0.1982
5.430	0.6651	0.6097		
5.450	0.6566	0.6053		
5.460	0.6150	0.5924		
5.470	0.5572	0.5698		
5.450	0.4965	0.5506		
5.410	0.4316	0.5288		
5.390	0.4093	0.5203		
5.370	0.3842	0.5129		
5.220	0.2961	0.4737		
4.980	0.2153	0.4185		
4.540	0.1254	0.3194		
4.260	0.0877	0.2571		
3.800	0.0358	0.1322		
Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. - Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary System Methane + Ethane + Carbon Dioxide at 230 K and Its Constituent Binaries at Temperatures from 207 to 270 K, Journal of Chemical & Engineering Data. 40 (1995) 726-731. doi:10.1021/je00020a002				

HA-NA systems (BAC = 2)

8.830	0.1035	0.2452	20.81	0.4754	0.5561	
8.950	0.1106	0.2670	21.00	0.5170	0.5807	
9.210	0.1280	0.2862	21.10	0.5344	0.5930	
9.480	0.1548	0.3225	21.16	0.5525	0.6001	
9.650	0.1712	0.3482	21.20	0.5720	0.6107	
10.38	0.2538	0.4280	21.28	0.6046	0.6287	
10.80	0.3300	0.4782	21.34	0.6583	0.6583	AZEO
10.98	0.3605	0.5022	21.34	0.6601	0.6589	
11.12	0.4092	0.5227	20.82	0.8279	0.7685	
11.22	0.4422	0.5402	19.91	0.9048	0.8497	
11.38	0.5195	0.5750	19.05	0.9589	0.9170	
11.45	0.6844	0.6484	18.21	0.9891	0.9790	
11.00	0.8438	0.7403				
10.23	0.9326	0.8389				
9.360	0.9828	0.9451				

Wallis, Kevin P - Clancy, Paulette - Zollweg, John A - Streett, William B, Excess thermodynamic properties for {xCO₂ + (1 - x)C₂H₆} (l): experiment and theory, The Journal of Chemical Thermodynamics. 16 (1984) 811-823. doi:10.1016/0021-9614(84)90028-4

T / K = 243.15

P / bar	x ₁	y ₁
11.56	0.0330	0.0960
12.44	0.0710	0.1770
14.14	0.1660	0.3160
15.34	0.2530	0.4100
16.38	0.3760	0.5000
17.07	0.5040	0.5730
17.29	0.5760	0.6100
17.29	0.7230	0.6910
16.73	0.8440	0.7760
15.46	0.9480	0.8940

Brown, T.S. - Kidnay, A.J. - Sloan, E.D., Vapor—liquid equilibria in the carbon dioxide-ethane system, Fluid Phase Equilibria. 40 (1988) 169-184. doi:10.1016/0378-3812(88)80028-1

T / K = 250.00

P / bar	x ₁	y ₁
14.35	0.0424	0.1092
14.82	0.0571	0.1442
15.50	0.0865	0.1944
15.76	0.0974	0.2109
16.49	0.1280	0.2576
16.92	0.1489	0.2885
17.50	0.1783	0.3216
18.67	0.2501	0.3988
19.73	0.3373	0.4688
20.22	0.3884	0.5023
20.24	0.3922	0.5038

Wallis, Kevin P - Clancy, Paulette - Zollweg, John A - Streett, William B, Excess thermodynamic properties for {xCO₂ + (1 - x)C₂H₆} (l): experiment and theory, The Journal of Chemical Thermodynamics. 16 (1984) 811-823. doi:10.1016/0021-9614(84)90028-4

T / K = 263.15

P / bar	x ₁	y ₁	
20.18	0.0450	0.1040	
24.11	0.1650	0.2860	
26.60	0.2730	0.3970	
27.80	0.3390	0.4530	
28.95	0.4250	0.5140	
30.08	0.5480	0.5960	
30.50	0.6540	0.6660	
30.46	0.6900	0.6900	AZEO
30.28	0.7730	0.7450	
29.60	0.8580	0.8160	
28.23	0.9370	0.9000	

Brown, T.S. - Kidnay, A.J. - Sloan, E.D., Vapor—liquid equilibria in the carbon dioxide-ethane system, Fluid Phase Equilibria. 40 (1988) 169-184. doi:10.1016/0378-3812(88)80028-1

T / K = 270.00

P / bar	x ₁	y ₁
24.34	0.0517	0.1056
25.72	0.0858	0.1641
26.35	0.1036	0.1898
27.34	0.1332	0.2297
28.70	0.1751	0.2824
29.76	0.2116	0.3227
30.83	0.2527	0.3632
31.81	0.2931	0.4014
32.65	0.3328	0.4362
33.60	0.3819	0.4751
35.19	0.4967	0.5594
35.81	0.5616	0.6036
36.10	0.6076	0.6360

HA-NA systems (BAC = 2)

36.36	0.6893	0.6914		Wallis, Kevin P - Clancy, Paulette - Zollweg, John A -
36.36	0.6925	0.6925	AZEO	Streett, William B, Excess thermodynamic properties for
36.27	0.7392	0.7261		{xCO ₂ + (1 - x)C ₂ H ₆ } (l): experiment and theory, The
36.21	0.7690	0.7494		Journal of Chemical Thermodynamics. 16 (1984) 811-823.
36.13	0.7783	0.7550		doi:10.1016/0021-9614(84)90028-4
35.85	0.8182	0.7864		T / K = 217.00
34.86	0.8940	0.8608		P / bar = UNKNOWN
34.49	0.9142	0.8788		(10.5067)
34.16	0.9328	0.9002		h ^M / J.mol ⁻¹ x ₁
32.82	0.9797	0.9645		1019.6 0.8029
				1345.7 0.6975
				1422.6 0.6118
				1464.4 0.5367
				1363.0 0.4116
				1322.1 0.3574
				1164.5 0.2889
Wei, Michael S.-W. - Brown, Trent S. - Kidnay, Arthur J. -				Wormald, C.J - Eyears, J.M, Excess molar enthalpies and
Sloan, E. Dendy, Vapor + Liquid Equilibria for the Ternary				excess molar volumes of {xCO ₂ + (1 - x)C ₂ H ₆ } up to 308.4
System Methane + Ethane + Carbon Dioxide at 230 K and				K and 11.0 MPa, The Journal of Chemical
Its Constituent Binaries at Temperatures from 207 to 270				Thermodynamics. 20 (1988) 323-331. doi:10.1016/0021-
K, Journal of Chemical & Engineering Data. 40 (1995) 726-				9614(88)90129-2
731. doi:10.1021/je00020a002				T / K = 248.10
T / K = 270.00				P / bar = 30.00
P / bar x ₁ y ₁				h ^M / J.mol ⁻¹ z ₁
33.44 0.9642 0.9337				519.00 0.9040
35.67 0.8418 0.8095				1048.0 0.8070
31.51 0.2907 0.4116				1365.0 0.7090
27.97 0.1568 0.2689				1514.0 0.6090
25.43 0.0801 0.1633				1509.0 0.5090
				1465.0 0.4590
				1301.0 0.4100
				671.00 0.1530
Ohgaki, Kazunari - Katayama, Takashi, Isothermal vapor-				Wormald, C.J - Eyears, J.M, Excess molar enthalpies and
liquid equilibrium data for the ethane—carbon dioxide				excess molar volumes of {xCO ₂ + (1 - x)C ₂ H ₆ } up to 308.4
system at high pressures, Fluid Phase Equilibria. 1 (1977)				K and 11.0 MPa, The Journal of Chemical
27-32. doi:10.1016/0378-3812(77)80023-X				Thermodynamics. 20 (1988) 323-331. doi:10.1016/0021-
T / K = 288.15				9614(88)90129-2
P / bar x ₁ y ₁				T / K = 272.10
38.59 0.0850 0.1379				P / bar = 45.00
40.48 0.1202 0.1836				h ^M / J.mol ⁻¹ z ₁
41.70 0.1473 0.2153				194.00 0.9590
45.27 0.2227 0.2980				432.00 0.9180
46.67 0.2552 0.3317				725.00 0.8700
48.66 0.3201 0.3897				906.00 0.8380
54.87 0.5596 0.5858				1075.0 0.7960
55.90 0.6172 0.6333				1416.0 0.7138
56.36 0.6846 0.6888				1475.0 0.6730
56.34 0.6977 0.6967				1595.0 0.6330
56.32 0.7367 0.7367 AZEO				1626.0 0.5920
56.32 0.7403 0.7379				1702.0 0.5250
56.31 0.7711 0.7508				
56.02 0.8351 0.8105				
54.87 0.8965 0.8708				
53.00 0.9591 0.9426				

Enthalpy of mixing				

HA-NA systems (BAC = 2)

1670.0	0.5080
1655.0	0.4650
1641.0	0.4250
1519.0	0.3400
1328.0	0.2990
1264.0	0.2560
1055.0	0.2130
792.00	0.1720
429.00	0.1250
137.00	0.0410

Wormald, C.J. - Hodgetts, R.W., Excess enthalpies and volumes for (carbon dioxide + ethane) atT= 291.6 K, close to the minimum in the critical locus, The Journal of Chemical Thermodynamics. 29 (1997) 75-85. doi:10.1006/jcht.1996.0141

T / K = 291.60

P / bar = 40.00

$h^M / J.mol^{-1}$	z_1
235.00	0.9780
462.00	0.9520
942.00	0.8930
1431.0	0.8340
1899.0	0.7750
2339.0	0.7160
2781.0	0.6560
3219.0	0.5970
3607.0	0.5370
4003.0	0.4760
4352.0	0.4170
4656.0	0.3580
4923.0	0.2960
5220.0	0.2370
5424.0	0.1780
5431.0	0.1190
27.00	0.0610

Wormald, C.J. - Hodgetts, R.W., Excess enthalpies and volumes for (carbon dioxide + ethane) atT= 291.6 K, close to the minimum in the critical locus, The Journal of Chemical Thermodynamics. 29 (1997) 75-85. doi:10.1006/jcht.1996.0141

T / K = 291.60

P / bar = 54.00

$h^M / J.mol^{-1}$	z_1
207.00	0.9790
243.00	0.9780
242.00	0.9770
460.00	0.9420
877.00	0.8820
1277.0	0.8230

1624.0	0.7620
1931.0	0.7030
2179.0	0.6440
2379.0	0.5840
2473.0	0.5250
2414.0	0.4640
-346.00	0.3820
-366.00	0.3460
-373.00	0.2870
-274.00	0.2250
-184.00	0.1660
-138.00	0.1070

Wormald, C.J. - Hodgetts, R.W., Excess enthalpies and volumes for (carbon dioxide + ethane) atT= 291.6 K, close to the minimum in the critical locus, The Journal of Chemical Thermodynamics. 29 (1997) 75-85. doi:10.1006/jcht.1996.0141

T / K = 291.60

P / bar = 58.50

$h^M / J.mol^{-1}$	z_1
509.00	0.9460
4872.0	0.8690
6123.0	0.8310
6055.0	0.7730
5904.0	0.7150
5530.0	0.6560
4867.0	0.5960
2473.0	0.5060
2264.0	0.4760
1957.0	0.4160
1699.0	0.3570
1431.0	0.2960
1151.0	0.2350
863.00	0.1730
538.00	0.1110

Wormald, C.J. - Hodgetts, R.W., Excess enthalpies and volumes for (carbon dioxide + ethane) atT= 291.6 K, close to the minimum in the critical locus, The Journal of Chemical Thermodynamics. 29 (1997) 75-85. doi:10.1006/jcht.1996.0141

T / K = 291.60

P / bar = 31.00

$h^M / J.mol^{-1}$	z_1
49.00	0.9780
200.00	0.8930
217.00	0.8340
256.00	0.7740
324.00	0.7140
377.00	0.6550

HA-NA systems (BAC = 2)

434.00	0.5350	Thermodynamics. 20 (1988) 323-331. doi:10.1016/0021-9614(88)90129-2
437.00	0.4760	
438.00	0.4140	T / K = 308.40
434.00	0.3550	P / bar = 65.00
394.00	0.2970	$h^M / \text{J.mol}^{-1}$ z_1
354.00	0.2350	424.00 0.9170
310.00	0.1760	685.00 0.8860
233.00	0.1180	670.00 0.8680
129.00	0.0560	1156.0 0.7720
		1503.0 0.7220
		1559.0 0.6730
		1740.0 0.6220
		1794.0 0.5720
		2014.0 0.5680
		2008.0 0.5190
		2016.0 0.5190
		2046.0 0.5190
		2201.0 0.4730
		2160.0 0.4240
		2156.0 0.3740
		1998.0 0.2940
		1680.0 0.2430
		659.00 0.1480
		317.00 0.0980
		Wormald, C.J - Eyears, J.M, Excess molar enthalpies and excess molar volumes of {xCO ₂ + (1 - x)C ₂ H ₆ } up to 308.4 K and 11.0 MPa, The Journal of Chemical Thermodynamics. 20 (1988) 323-331. doi:10.1016/0021-9614(88)90129-2
		T / K = 308.40
		P / bar = 83.00
		$h^M / \text{J.mol}^{-1}$ z_1
		1684.0 0.8980
		2039.0 0.8470
		2354.0 0.7480
		2418.0 0.6970
		2365.0 0.6690
		2280.0 0.5950
		2159.0 0.5460
		2010.0 0.4950
		1861.0 0.4460
		1401.0 0.3420
		1266.0 0.2940
		1053.0 0.2420
		897.00 0.1960
		685.00 0.1480
		440.00 0.0980
		204.00 0.0460
		Wormald, C.J - Eyears, J.M, Excess molar enthalpies and excess molar volumes of {xCO ₂ + (1 - x)C ₂ H ₆ } up to 308.4 K and 11.0 MPa, The Journal of Chemical Thermodynamics. 20 (1988) 323-331. doi:10.1016/0021-9614(88)90129-2
		T / K = 308.40
		P / bar = 40.00
		$h^M / \text{J.mol}^{-1}$ z_1
		133.00 0.9030
		249.00 0.8090
		340.00 0.7110
		402.00 0.6160
		433.00 0.5120
		436.00 0.3130
		356.00 0.2100
		236.00 0.1060
		Wormald, C.J - Eyears, J.M, Excess molar enthalpies and excess molar volumes of {xCO ₂ + (1 - x)C ₂ H ₆ } up to 308.4 K and 11.0 MPa, The Journal of Chemical Thermodynamics. 20 (1988) 323-331. doi:10.1016/0021-9614(88)90129-2

Wormald, C.J - Eyears, J.M, Excess molar enthalpies and excess molar volumes of {xCO₂ + (1 - x)C₂H₆} up to 308.4 K and 11.0 MPa, The Journal of Chemical Thermodynamics. 20 (1988) 323-331. doi:10.1016/0021-9614(88)90129-2

T / K = 308.40

P / bar = 110.00

h^M / J.mol⁻¹

z₁

527.00 0.8980

1121.0 0.7950

1355.0 0.6940

1454.0 0.6430

1454.0 0.6180

1478.0 0.5930

1476.0 0.5700

1470.0 0.5430

1465.0 0.5200

1438.0 0.4950

1404.0 0.4860

1397.0 0.4450

1307.0 0.3920

1061.0 0.2920

759.00 0.1930

393.00 0.0950

Critical point

Khazanova, N.E. - Sominskaya, E.E. - Zakharova, A.V. - Rozovski, M.B., Thermodynamic properties of the ethane-carbon dioxide system and the pressure-volume-temperature-normality data, Teplofiz. Svoistva Veshchestv Mater. 10 (1976) 213-219.

T / K P / bar x₁

290.70 58.16 0.5690

291.59 60.59 0.6790

292.45 54.51 0.3960

292.72 62.28 0.7360

292.95 62.39 0.7450

293.19 62.87 0.7540

294.77 64.75 0.8050

295.03 65.25 0.8130

299.00 68.90 0.9060

303.19 50.66 0.1500

Khazanova, N.E. - Lesnevskaya, L.S. - Zakharova, A.V., Liquid-vapor equilibrium in the ethane-CO₂ system, Khim. Promst. Moscow. 44 (1966) 364-365.

T / K P / bar x₁

290.75 58.26 0.5730

290.95 58.97 0.6000

291.35 56.54 0.5000

292.75 55.02 0.4000

295.25 65.56 0.8000

295.45 53.40 0.3000

297.75 51.88 0.2000

299.05 69.41 0.9000

301.45 50.36 0.1000

Ohgaki, Kazunari - Katayama, Takashi, Isothermal vapor-liquid equilibrium data for the ethane—carbon dioxide system at high pressures, Fluid Phase Equilibria. 1 (1977) 27-32. doi:10.1016/0378-3812(77)80023-X

T / K P / bar x₁

290.96 58.60 0.5767

290.97 60.11 0.6222

291.60 61.28 0.6871

292.04 63.21 0.7372

293.15 55.29 0.3735

295.90 66.17 0.8202

Gil, Laura - Otín, Santos F. - Embid, Jose Muñoz - Gallardo, M. Asunción - Blanco, Sofía - Artal, Manuela - Velasco, Inmaculada, Experimental setup to measure critical properties of pure and binary mixtures and their densities at different pressures and temperatures, The Journal of Supercritical Fluids. 44 (2008) 123-138. doi:10.1016/j.supflu.2007.11.003

T / K P / bar x₁

291.00 57.02 0.5016

291.08 57.76 0.5517

291.09 59.49 0.5988

291.63 60.22 0.6493

291.90 56.34 0.4484

292.31 61.54 0.6991

293.25 54.95 0.3493

293.65 63.35 0.7526

295.18 54.37 0.3006

295.83 53.83 0.2546

296.12 66.32 0.8019

298.15 68.19 0.8688

298.56 52.85 0.2008

299.12 52.06 0.1540

299.15 69.12 0.8988

301.80 71.62 0.9495

301.84 51.08 0.1005

304.01 50.01 0.0305

Horstmann, Sven - Fischer, Kai - Gmehling, Jürgen - Kolář, Petr, Experimental determination of the critical line for (carbon dioxide + ethane) and calculation of various thermodynamic properties for (carbon dioxide + n-alkane) using the PSRK model, The Journal of Chemical

Thermodynamics. 32 (2000) 451-464.
doi:10.1006/jcht.2000.0611

T / K	P / bar	x ₁
291.04	57.87	0.5605
291.48	60.26	0.6601
291.80	56.44	0.4607
293.66	54.85	0.3548
293.71	63.58	0.7657
296.82	53.52	0.2403
298.16	68.31	0.8805
300.70	51.62	0.1223

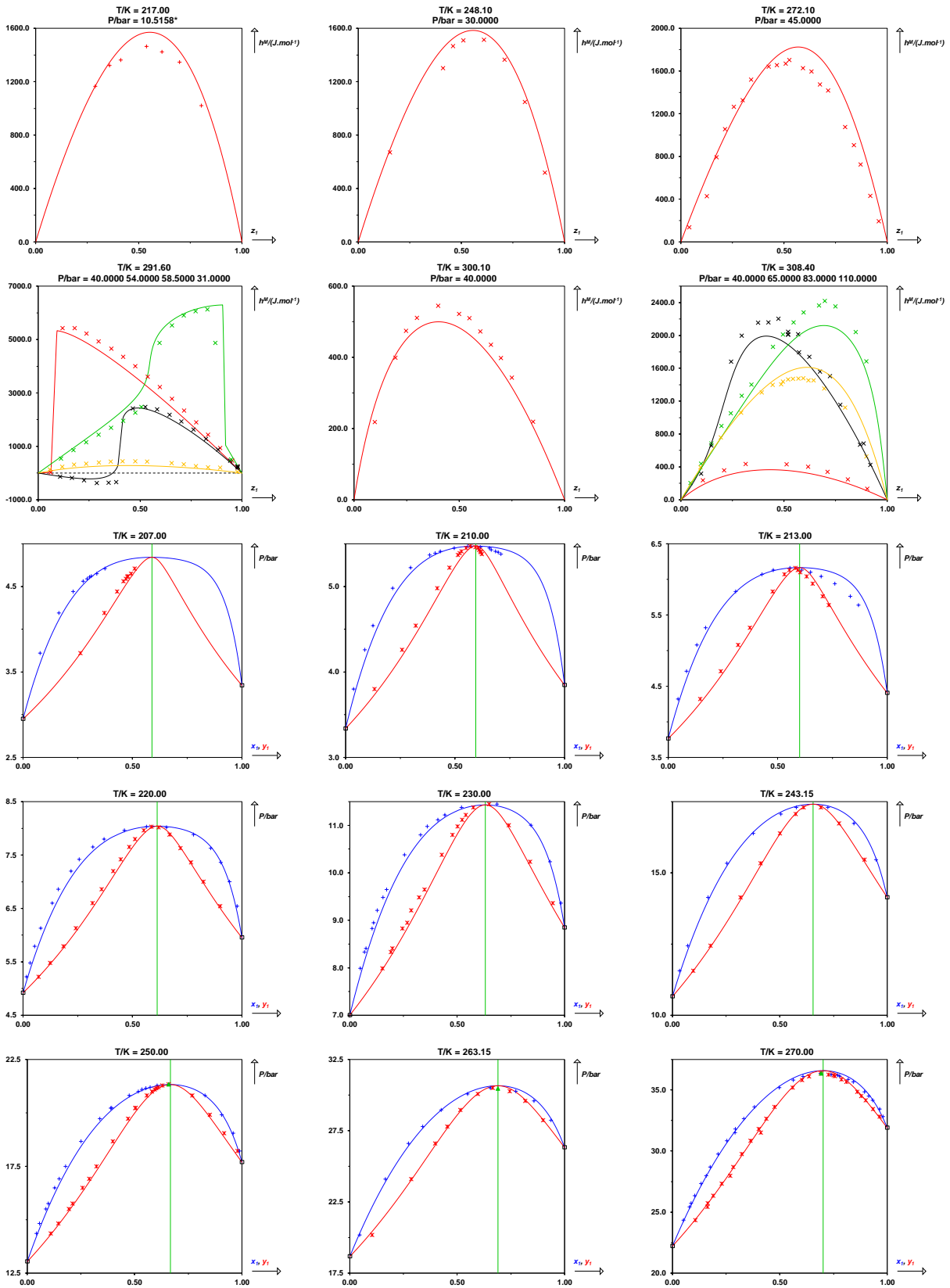
Goodwin, Anthony R.H. - Moldover, Michael R., Phase border and density determinations in the critical region of (carbon dioxide+ethane) determined from dielectric permittivity measurements, The Journal of Chemical Thermodynamics. 29 (1997) 1481-1494.
doi:10.1006/jcht.1997.0257

T / K	P / bar	x ₁
291.13	56.84	0.4924
292.98	62.78	0.7398
296.51	53.47	0.2517

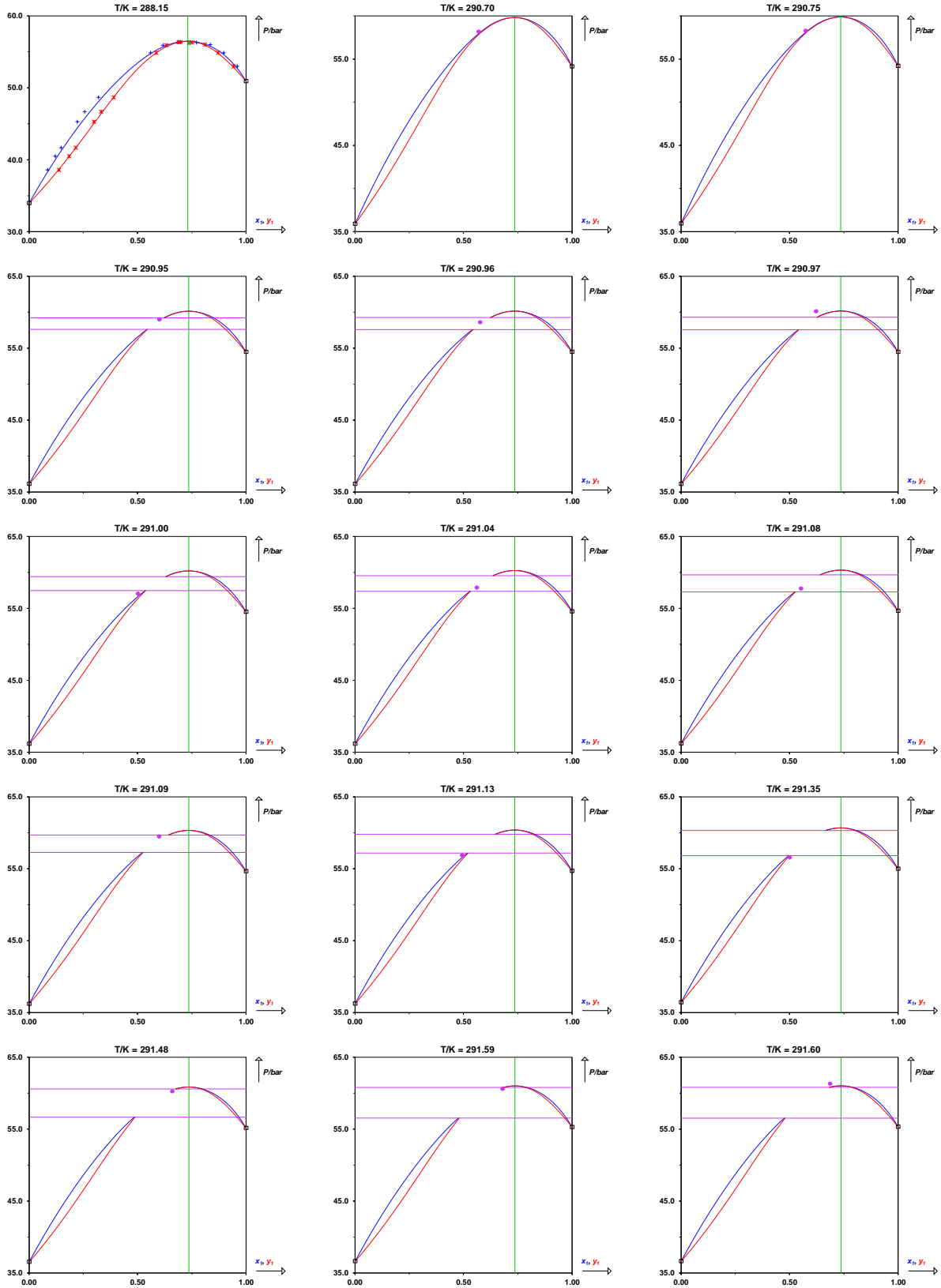
Morrison, G. - Kincaid, J. M., Critical point measurements on nearly polydisperse fluids, AIChE Journal. 30 (1984) 257-262. doi:10.1002/aic.690300213

T / K	P / bar	x ₁
298.92	69.35	0.9025
302.66	72.50	0.9739

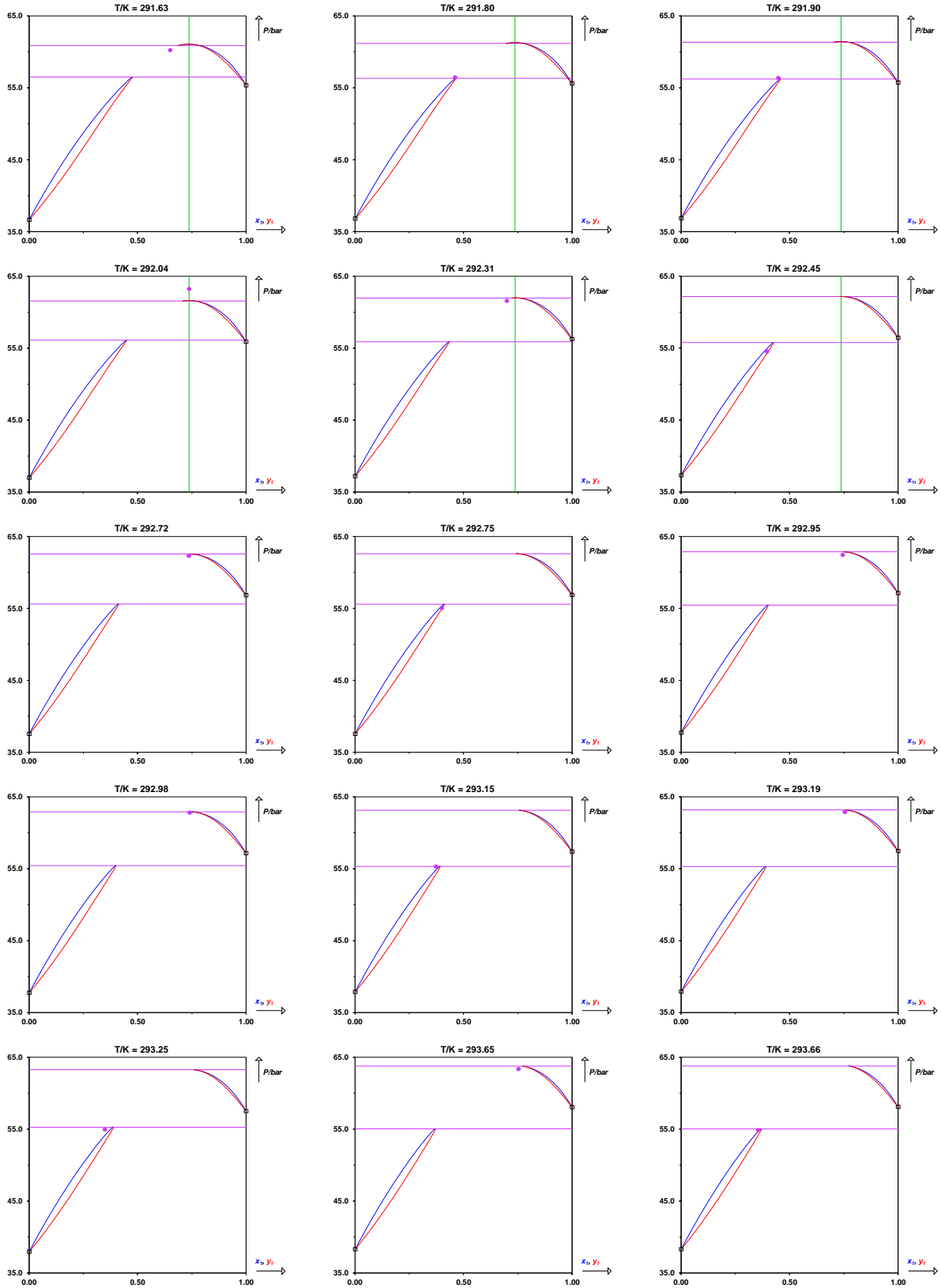
HA-NA systems (BAC = 2)



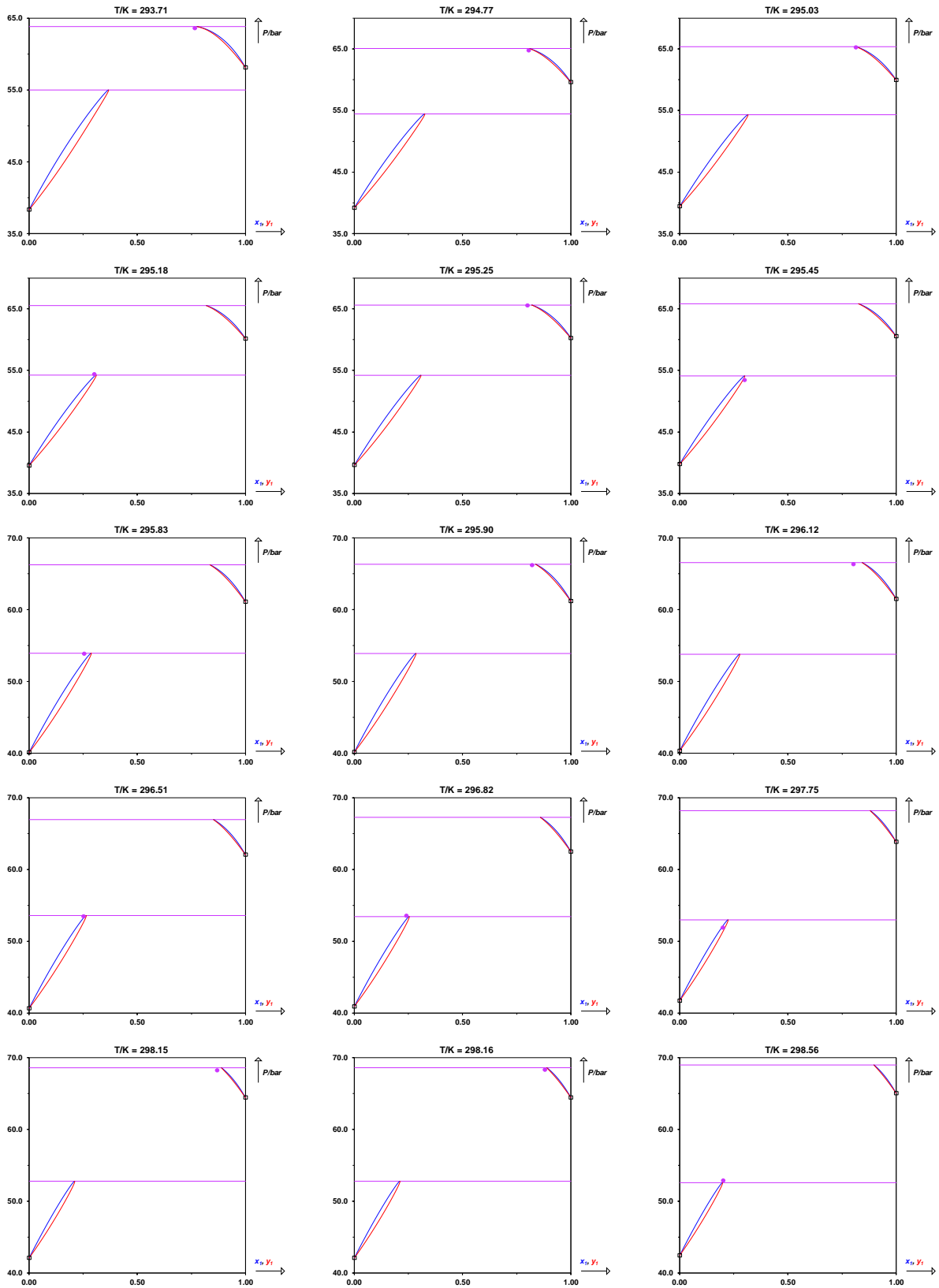
HA-NA systems (BAC = 2)



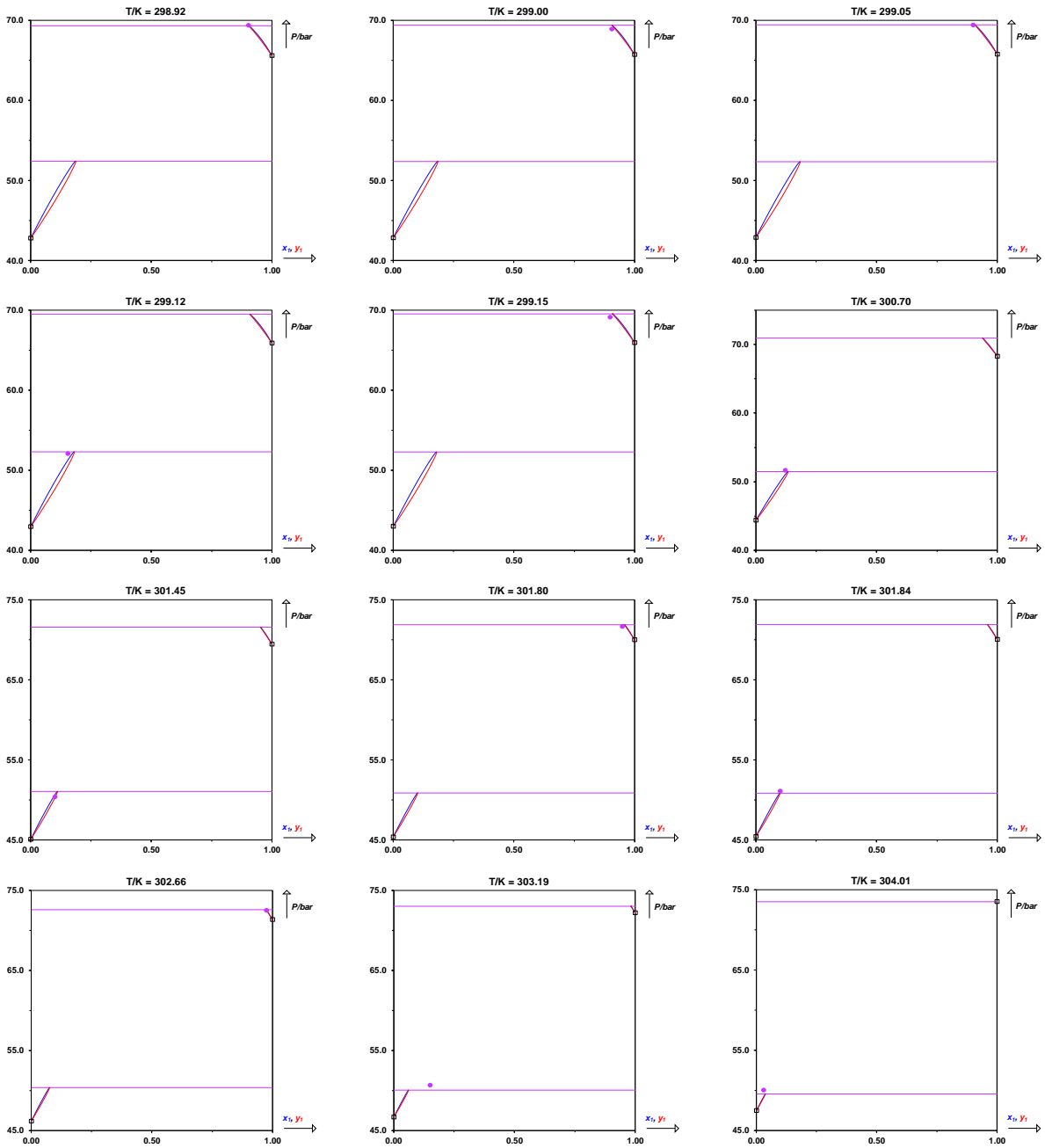
HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



CARBON DIOXIDE (1) + PROPANE (2)

CAS	124-38-9	74-98-6
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	ATUOYWHRKTHZ-UHFFFAOYSA-N
T_c / K	304.21	369.83
P_c / bar	73.83	42.48
ω	0.224	0.152

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 130.5$

$B/\text{MPa} = 247.5$

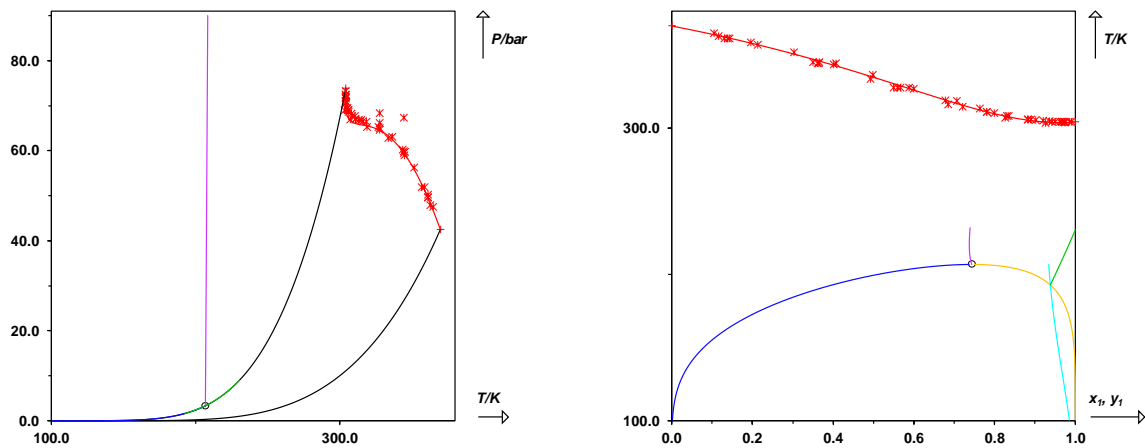
Deviations

MAPE on $x = 4.4\%$

MAPE on $y = 2.7\%$

MAPE on $x_c = 14\%$

MAPE on $P_c = 2.0\%$



-----			7.500	0.0630	0.4380
Isothermal phase equilibrium data			8.180	0.0757	0.4786
-----			9.770	0.1139	0.5638
Yucelen, Belgin - Kidnay, Arthur J., Vapor-Liquid Equilibria in the Nitrogen + Carbon Dioxide + Propane System from 240 to 330 K at Pressures to 15 MPa, Journal of Chemical & Engineering Data. 44 (1999) 926-931. doi:10.1021/je980321e			10.96	0.1407	0.6142
T / K = 240.00			12.51	0.1722	0.6651
P / bar	x ₁	y ₁	13.87	0.2169	0.7001
3.160	0.0604	0.5424	15.98	0.2820	0.7444
4.480	0.1203	0.6787	17.58	0.3231	0.7721
4.640	0.1282	0.6935	19.18	0.3742	0.7953
7.440	0.2727	0.8184	20.79	0.4443	0.8214
8.370	0.3354	0.8488	22.30	0.5051	0.8373
8.811	0.3736	0.8583	23.17	0.5408	0.8489
10.17	0.5165	0.8902	24.06	0.5820	0.8585
10.57	0.5700	0.8933	24.70	0.6110	0.8645
12.00	0.8206	0.9302	26.01	0.6730	0.8804
			26.76	0.7089	0.8900
			27.99	0.7716	0.9066
			27.83	0.7730	0.9054
			28.79	0.8174	0.9196
			29.60	0.8620	0.9339
			30.35	0.9003	0.9493
			31.03	0.9403	0.9656
			31.34	0.9565	0.9745
Kim, Ju Hyok - Kim, Min Soo, Vapor-liquid equilibria for the carbon dioxide+propane system over a temperature range from 253.15 to 323.15K, Fluid Phase Equilibria. 238 (2005) 13-19. doi:10.1016/j.fluid.2005.09.006					
T / K = 253.15					
P / bar	x ₁	y ₁	Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Propane-Carbon Dioxide System, Industrial & Engineering Chemistry. 43 (1951) 2515-2520. doi:10.1021/ie50503a035		
3.092	0.0160	0.1910	T / K = 277.59		
4.075	0.0420	0.3880	P / bar	x ₁	y ₁
5.560	0.0840	0.5440	6.895	0.0247	0.2056
8.199	0.1700	0.6930	10.34	0.0884	0.4676
11.01	0.2790	0.7830	13.79	0.1602	0.6036
11.62	0.3050	0.7980	17.24	0.2402	0.6864
12.82	0.3850	0.8340	20.69	0.3316	0.7431
14.03	0.4550	0.8550	24.13	0.4361	0.7876
14.73	0.5000	0.8660	27.58	0.5532	0.8309
15.19	0.5360	0.8750	31.03	0.6714	0.8688
15.75	0.5820	0.8820	34.48	0.7956	0.9102
16.57	0.6570	0.8950	37.92	0.9401	0.9702
18.04	0.8150	0.9240			
18.48	0.8700	0.9350	Tanaka, Katsuyuki - Higashi, Yukihiro - Akasaka, Ryo - Kayukawa, Yohei - Fujii, Kenich, Measurements of the Vapor-Liquid Equilibrium for the CO ₂ + R290 Mixture, Journal of Chemical & Engineering Data. 54 (2009) 1029-1033. doi:10.1021/je800938s		
Webster, Leigh A. - Kidnay, Arthur J., Vapor-Liquid Equilibria for the Methane-Propane-Carbon Dioxide Systems at 230 K and 270 K, Journal of Chemical & Engineering Data. 46 (2001) 759-764. doi:10.1021/je000307d					
T / K = 270.00					
P / bar	x ₁	y ₁	T / K = 283.15		
6.040	0.0337	0.2915	P / bar	x ₁	y ₁
6.410	0.0409	0.3347	9.610	0.0610	0.3250
6.790	0.0490	0.3735	17.57	0.2060	0.6300
7.180	0.0569	0.4061			

HA-NA systems (BAC = 2)

23.98	0.3520	0.7280	The Journal of Chemical Thermodynamics. 22 (1990) 777-795. doi:10.1016/0021-9614(90)90070-7			
27.94	0.4490	0.7730	T / K = 311.05			
39.21	0.7810	0.8910	P / bar	x ₁	y ₁	
Kim, Ju Hyok - Kim, Min Soo, Vapor-liquid equilibria for the carbon dioxide+propane system over a temperature range from 253.15 to 323.15K, Fluid Phase Equilibria. 238 (2005) 13-19. doi:10.1016/j.fluid.2005.09.006			14.89	0.0199	0.1100	
			16.07	0.0343	0.1673	
			17.49	0.0505	0.2280	
			18.96	0.0692	0.2817	
			20.30	0.0858	0.3243	
			21.62	0.1014	0.3636	
			22.80	0.1166	0.3921	
			24.25	0.1347	0.4243	
			25.92	0.1573	0.4589	
			27.60	0.1774	0.4888	
			29.55	0.2048	0.5198	
			31.41	0.2285	0.5454	
			33.29	0.2542	0.5699	
			35.37	0.2831	0.5920	
			37.01	0.3076	0.6088	
			39.62	0.3458	0.6383	
			41.51	0.3729	0.6529	
43.22	0.3988	0.6680				
45.12	0.4262	0.6800				
47.04	0.4564	0.6933				
48.97	0.4853	0.7055				
50.97	0.5187	0.7162				
52.68	0.5435	0.7265				
53.18	0.5520	0.7290				
54.84	0.5780	0.7386				
54.86	0.5794	0.7384				
57.04	0.6117	0.7488				
57.20	0.6143	0.7507				
58.87	0.6403	0.7602				
59.02	0.6412	0.7606				
60.91	0.6703	0.7705				
62.97	0.7049	0.7811				
64.12	0.7205	0.7820				
65.29	0.7405	0.7894				
66.40	0.7600	0.7910				
66.78	0.7695	0.7867				
67.02	0.7800	0.7800	CRIT			
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Propane-Carbon Dioxide System, Industrial & Engineering Chemistry. 43 (1951) 2515-2520. doi:10.1021/ie50503a035			T / K = 294.26			
			P / bar	x ₁	y ₁	
			10.34	0.0245	0.1618	
			13.79	0.0742	0.3589	
			17.24	0.1274	0.4812	
			20.69	0.1834	0.5634	
24.13	0.2423	0.6235				
27.58	0.3048	0.6718				
31.03	0.3727	0.7148				
34.48	0.4443	0.7518				
37.92	0.5178	0.7814				
41.37	0.5937	0.8092				
44.82	0.6722	0.8368				
48.26	0.7516	0.8673				
51.71	0.8275	0.9011				
55.16	0.9046	0.9417				
58.61	0.9805	0.9874				
Niesen, Vicki G - Rainwater, James C, Critical locus, (vapor + liquid) equilibria, and coexisting densities of (carbon dioxide + propane) at temperatures from 311 K to 361 K,			T / K = 323.15			
			P / bar	x ₁	y ₁	
			19.11	0.0210	0.0880	
21.24	0.0440	0.1640				
Kim, Ju Hyok - Kim, Min Soo, Vapor-liquid equilibria for the carbon dioxide+propane system over a temperature range from 253.15 to 323.15K, Fluid Phase Equilibria. 238 (2005) 13-19. doi:10.1016/j.fluid.2005.09.006			T / K = 323.15			
			P / bar	x ₁	y ₁	
19.11	0.0210	0.0880				
21.24	0.0440	0.1640				

HA-NA systems (BAC = 2)

24.58	0.0790	0.2570		65.50	0.3735	0.4202	
32.30	0.1650	0.4070		67.29	0.4070	0.4070	CRIT
35.63	0.2040	0.4550					
41.27	0.2690	0.5130					
48.42	0.3570	0.5750					
52.91	0.4160	0.6020					
57.38	0.4780	0.6210					
60.75	0.5250	0.6320					
62.81	0.5590	0.6360					
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Propane-Carbon Dioxide System, Industrial & Engineering Chemistry. 43 (1951) 2515-2520. doi:10.1021/ie50503a035				Niesen, Vicki G - Rainwater, James C, Critical locus, (vapor + liquid) equilibria, and coexisting densities of (carbon dioxide + propane) at temperatures from 311 K to 361 K, The Journal of Chemical Thermodynamics. 22 (1990) 777-795. doi:10.1016/0021-9614(90)90070-7			
T / K = 327.59				T / K = 344.43			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
20.69	0.0176	0.0734		28.91	0.0214	0.0650	
24.13	0.0526	0.1873		29.85	0.0293	0.0860	
27.58	0.0882	0.2739		31.38	0.0430	0.1200	
31.03	0.1246	0.3425		32.89	0.0566	0.1478	
34.48	0.1618	0.3980		35.30	0.0800	0.1934	
37.92	0.1992	0.4426		35.75	0.0833	0.2031	
41.37	0.2376	0.4804		38.13	0.1065	0.2365	
44.82	0.2770	0.5124		40.22	0.1265	0.2655	
48.26	0.3171	0.5394		42.37	0.1451	0.2902	
51.71	0.3577	0.5619		43.43	0.1562	0.3025	
55.16	0.3996	0.5806		44.89	0.1703	0.3168	
58.61	0.4403	0.5896		47.61	0.1981	0.3417	
62.05	0.4840	0.5968		49.59	0.2190	0.3598	
65.50	0.5306	0.5980		50.54	0.2274	0.3640	
68.40	0.5880	0.5880	CRIT	51.79	0.2420	0.3740	
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the Propane-Carbon Dioxide System, Industrial & Engineering Chemistry. 43 (1951) 2515-2520. doi:10.1021/ie50503a035				Niesen, Vicki G - Rainwater, James C, Critical locus, (vapor + liquid) equilibria, and coexisting densities of (carbon dioxide + propane) at temperatures from 311 K to 361 K, The Journal of Chemical Thermodynamics. 22 (1990) 777-795. doi:10.1016/0021-9614(90)90070-7			
T / K = 344.26				T / K = 361.15			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
27.58	0.0099	0.0315		38.00	0.0125	0.0306	
31.03	0.0409	0.1153		40.62	0.0354	0.0701	
34.48	0.0726	0.1832		43.10	0.0584	0.1004	
37.92	0.1043	0.2377		44.54	0.0720	0.1176	
41.37	0.1370	0.2840		47.33	0.1000	0.1423	
44.82	0.1698	0.3218		48.60	0.1149	0.1505	
48.26	0.2019	0.3513		49.26	0.1255	0.1535	
51.71	0.2338	0.3743		49.60	0.1394	0.1394	CRIT
55.16	0.2666	0.3930		49.75	0.1444	0.1448	
58.61	0.2998	0.4068					
62.05	0.3348	0.4162					

Isobaric phase equilibrium data

Poettmann, Fred H. - Katz, D. L., Phase Behavior of Binary Carbon Dioxide-Paraffin Systems, Industrial & Engineering Chemistry. 37 (1945) 847-853. doi:10.1021/ie50429a017

P / bar = 46.68

T / K	x ₁	y ₁
288.15	0.9000	0.9480
292.55	0.8000	0.9030
298.15	0.7000	0.8510
304.85	0.6000	0.7940
312.05	0.5000	0.7320
319.25	0.4000	0.6580
331.45	0.3000	0.5400
346.45	0.2000	0.3720
363.15	0.1000	0.1780

Poettmann, Fred H. - Katz, D. L., Phase Behavior of Binary Carbon Dioxide-Paraffin Systems, Industrial & Engineering Chemistry. 37 (1945) 847-853. doi:10.1021/ie50429a017

P / bar = 53.35

T / K	x ₁	y ₁
295.35	0.9000	0.9380
299.25	0.8000	0.8840
305.95	0.7000	0.8200
313.15	0.6000	0.7520
320.95	0.5000	0.6780
328.75	0.4000	0.6030
340.35	0.3000	0.4870
358.15	0.2000	0.2730

Critical point

Juntarachat, Niramol - Bello, Salma - Privat, Romain - Jaubert, Jean-Noël, Validation of a New Apparatus Using the Dynamic Method for Determining the Critical Properties of Binary Gas/Gas Mixtures, Journal of Chemical & Engineering Data. 58 (2013) 671-676. doi:10.1021/je301209u

T / K	P / bar	x ₁
303.46	68.94	0.9252
307.12	66.90	0.8254
319.00	65.29	0.6773
333.78	62.76	0.4928
344.98	58.99	0.3654
356.93	51.93	0.2129
362.84	47.91	0.1157

Morrison, G. - Kincaid, J. M., Critical point measurements on nearly polydisperse fluids, AIChE Journal. 30 (1984) 257-262. doi:10.1002/aic.690300213

T / K	P / bar	x ₁
304.13	72.29	0.9739
304.13	72.30	0.9734
304.14	72.00	0.9718
304.14	71.83	0.9667
304.15	72.43	0.9857
304.15	71.78	0.9659
304.17	73.24	0.9895
304.17	71.58	0.9609
304.28	71.08	0.9504
305.35	69.50	0.9015

Horstmann, S. - Fischer, K. - Gmehling, J., Experimental Determination of Critical Points of Pure Components and Binary Mixtures Using a Flow Apparatus, Chemical Engineering & Technology. 22 (1999) 839-842. doi:10.1002/(SICI)1521-4125(199910)22:10<839::AID-CEAT839>3.0.CO;2-L

T / K	P / bar	x ₁
304.34	70.73	0.9410
306.10	68.59	0.8814
308.47	67.65	0.8353
313.45	66.81	0.7640
318.40	66.37	0.7060
326.98	65.20	0.5999
336.37	63.08	0.4986
343.59	60.29	0.4017
351.77	56.26	0.3029
358.67	51.87	0.1965
364.76	47.44	0.1041

Ke, Jie - George, Michael W. - Poliakoff, Martyn - Han, Buxing - Yan, Haike, How Does the Critical Point Change during the Hydrogenation of Propene in Supercritical Carbon Dioxide?, The Journal of Physical Chemistry B. 106 (2002) 4496-4502. doi:10.1021/jp0129333

T / K	P / bar	x ₁
304.70	70.70	0.9356
306.10	69.00	0.8833
310.30	67.70	0.7988
314.70	66.80	0.7204
316.10	66.50	0.6851

Roof, J. G. - Baron, J. D., Critical loci of binary mixtures of propane with methane, carbon dioxide, and nitrogen, Journal of Chemical & Engineering Data. 12 (1967) 292-293. doi:10.1021/je60034a003

T / K	P / bar	x ₁
304.98	69.29	0.9200

305.87	68.95	0.8900
308.21	68.19	0.8300
327.76	66.19	0.5500
345.15	59.78	0.3500
361.26	50.19	0.1300

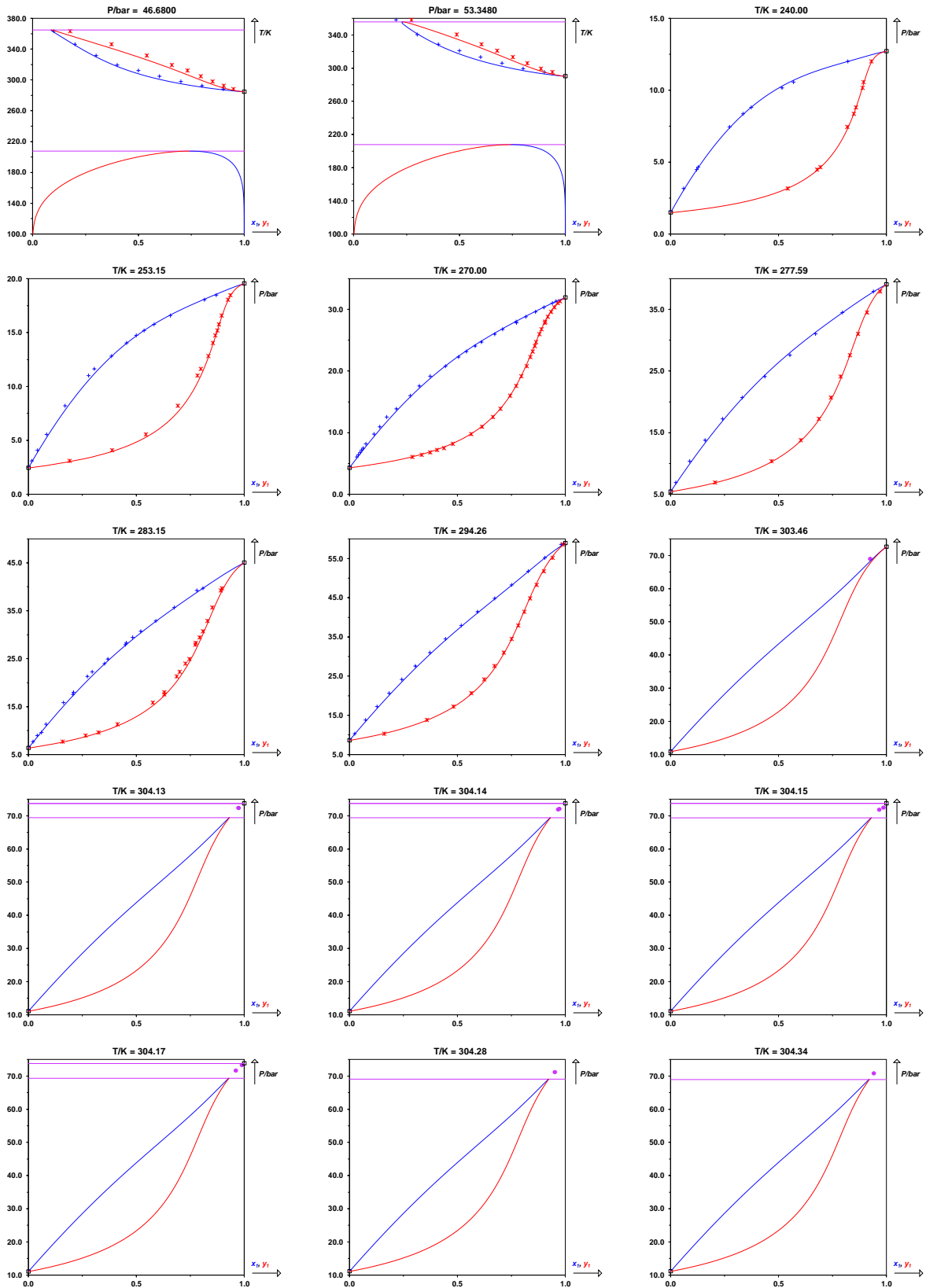
Van Poolen, Lambert J. - Holcomb, Cynthia D., Critical temperatures, pressures, and densities for the mixtures CO₂-C₃H₈, CO₂-nC₄H₁₀, C₂H₆-C₃H₈, and C₃H₈-nC₄H₁₀, Fluid Phase Equilibria. 165 (1999) 157-168. doi:10.1016/S0378-3812(99)00275-7

T / K	P / bar	x ₁
311.04	66.86	0.7805
327.74	64.97	0.5659
344.41	59.41	0.3612
361.13	49.68	0.1428

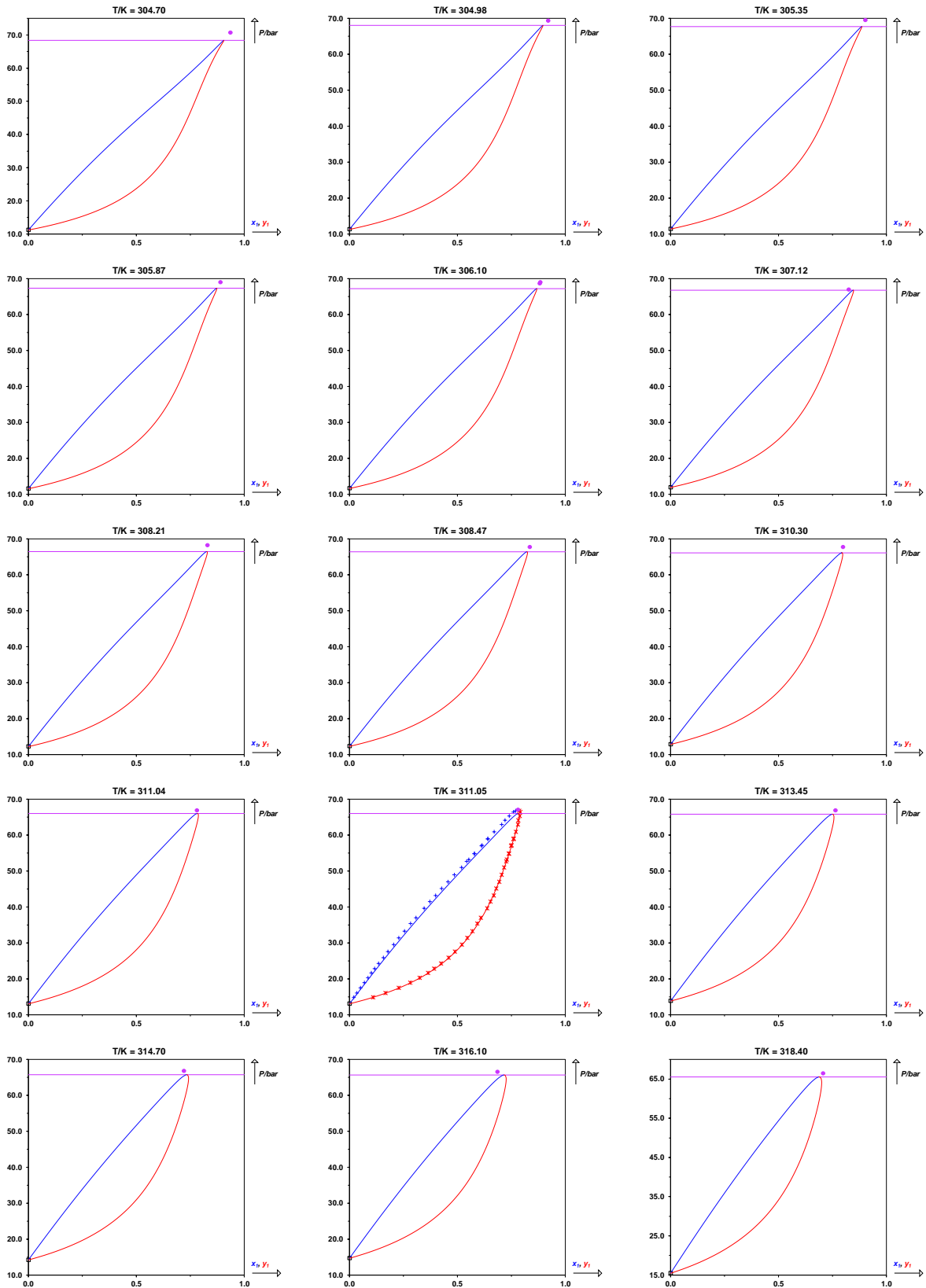
Niesen, Vicki G - Rainwater, James C, Critical locus, (vapor + liquid) equilibria, and coexisting densities of (carbon dioxide + propane) at temperatures from 311 K to 361 K, The Journal of Chemical Thermodynamics. 22 (1990) 777-795. doi:10.1016/0021-9614(90)90070-7

T / K	P / bar	x ₁
327.75	64.60	0.5594

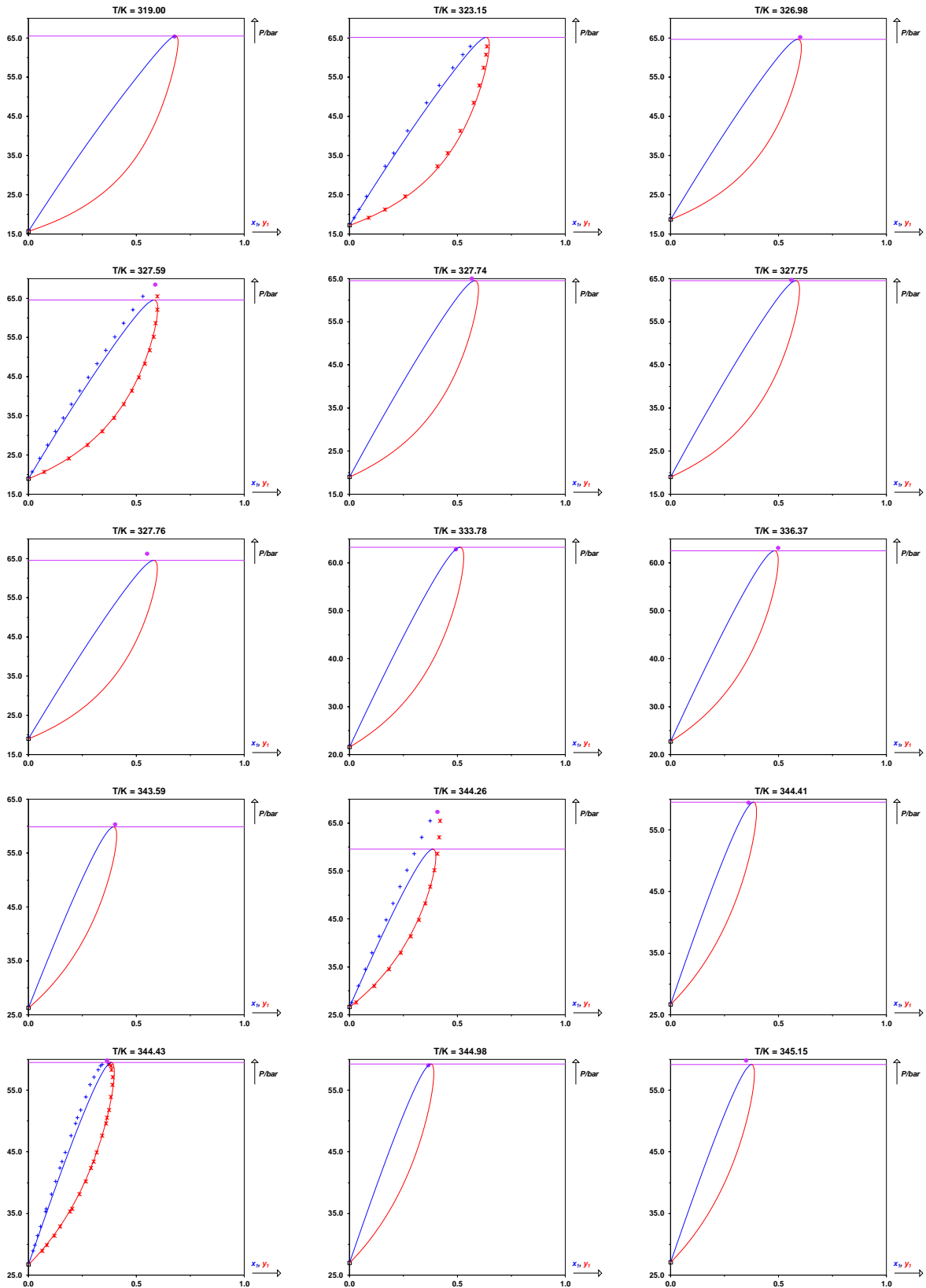
HA-NA systems (BAC = 2)



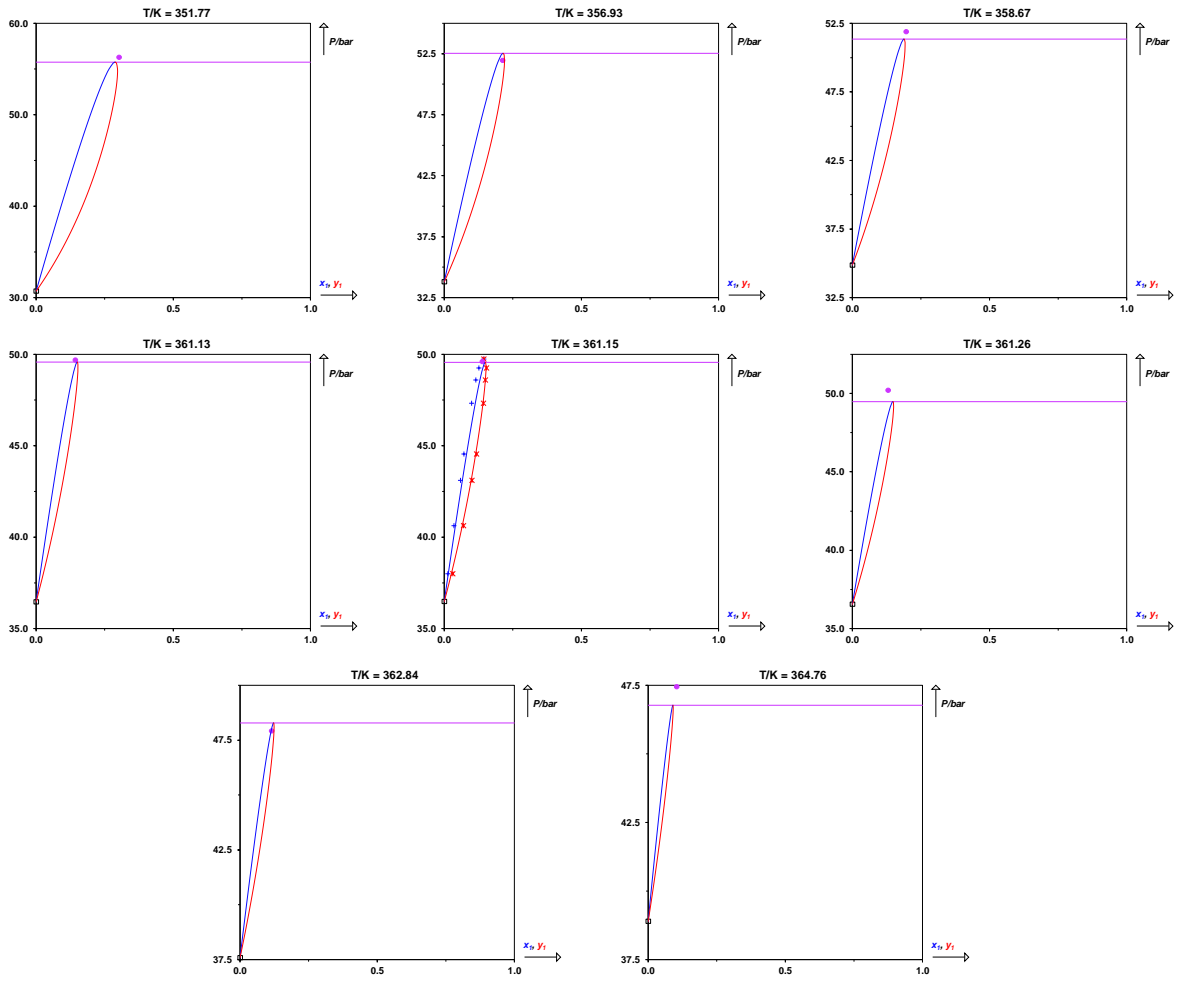
HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



CARBON DIOXIDE (1) + n-BUTANE (2)

CAS	124-38-9	106-97-8
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	IJDNQMDRQITEOD-UHFFFAOYSA-N
T_c / K	304.21	425.12
P_c / bar	73.83	37.96
ω	0.224	0.200

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 135.0$

$B/\text{MPa} = 188.2$

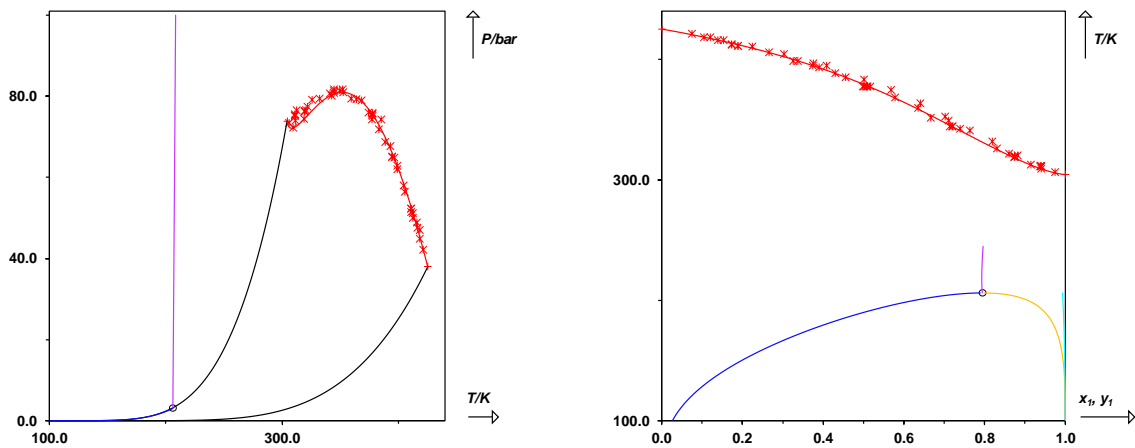
Deviations

MAPE on $x = 3.3\%$

MAPE on $y = 3.3\%$

MAPE on $x_c = 4.3\%$

MAPE on $P_c = 1.5\%$



Isothermal phase equilibrium data			T / K =	260.00	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
2.760	0.0603	0.8567	3.070	0.0530	0.7970
3.260	0.0743	0.8775	5.520	0.1110	0.8860
4.049	0.0972	0.9019	7.650	0.1670	0.9180
5.253	0.1330	0.9246	9.110	0.2110	0.9310
6.433	0.1728	0.9384	10.81	0.2560	0.9420
8.267	0.2407	0.9524	12.33	0.3230	0.9500
8.425	0.2459	0.9533	13.93	0.3850	0.9570
11.38	0.4097	0.9673	15.31	0.4590	0.9610
12.65	0.5063	0.9715	16.48	0.5200	0.9650
13.53	0.5780	0.9746	17.32	0.5650	0.9670
14.18	0.6356	0.9768	18.40	0.6460	0.9710
14.73	0.7003	0.9789	19.61	0.7340	0.9750
14.76	0.7171	0.9794	20.50	0.8020	0.9780
15.20	0.7639	0.9810	21.11	0.8410	0.9800
15.76	0.8229	0.9838	21.66	0.8740	0.9830
16.45	0.9024	0.9880	21.98	0.9050	0.9840
16.49	0.9001	0.9873			
Brown, T.S. - Niesen, V.G. - Sloan, E.D. - Kidnay, A.J., Vapor-liquid equilibria for the binary systems of nitrogen, carbon dioxide, and n-butane at temperatures from 220 to 344 K., Fluid Phase Equilibria. 53 (1989) 7-14. doi:10.1016/0378-3812(89)80067-6			Nagahama, Kunio - Konishi, Hitoshi - Hoshino, Daisuke - Hirata, Mitsuo, Binary Vapor-Liquid Equilibria Of Carbon Dioxide-Light Hydrocarbons At Low Temperature, Journal of Chemical Engineering of Japan. 7 (1974) 323-328. doi:10.1252/jcej.7.323		
Isothermal phase equilibrium data			T / K =	273.15	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
1.048	0.0109	0.5112	2.432	0.0300	0.5880
1.544	0.0223	0.6634	3.952	0.0570	0.7410
2.317	0.0387	0.7804	5.877	0.0940	0.8260
3.475	0.0686	0.8505	8.410	0.1440	0.8770
5.537	0.1233	0.9104	10.74	0.2000	0.9000
7.674	0.1888	0.9406	13.07	0.2750	0.9160
9.742	0.2634	0.9526	15.50	0.3340	0.9200
12.56	0.3831	0.9654	18.04	0.3980	0.9320
14.93	0.5225	0.9716	20.27	0.4690	0.9420
17.64	0.7387	0.9794	23.20	0.5680	0.9510
18.86	0.8150	0.9833	26.04	0.6810	0.9630
Kalra, Harish - Krishnana, Thamra R. - Robinson, Donald B., Equilibrium-phase properties of carbon dioxide-butane and nitrogen-hydrogen sulfide systems at subambient temperatures, Journal of Chemical & Engineering Data. 21 (1976) 222-225. doi:10.1021/je60069a027			Weber, L.A., Vapour-liquid equilibria measurements for carbon dioxide with normal and isobutane from 250 to 280 K, Cryogenics. 25 (1985) 338-342. doi:10.1016/0011-2275(85)90019-0		
Isothermal phase equilibrium data			T / K =	280.00	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
3.620	0.0300	0.6180	4.026	0.0420	0.6600
5.940	0.0680	0.7640	5.980	0.0720	0.7690
6.240	0.0690	0.7810			
Weber, L.A., Vapour-liquid equilibria measurements for carbon dioxide with normal and isobutane from 250 to 280 K, Cryogenics. 25 (1985) 338-342. doi:10.1016/0011-2275(85)90019-0			Weber, L.A., Vapour-liquid equilibria measurements for carbon dioxide with normal and isobutane from 250 to 280 K, Cryogenics. 25 (1985) 338-342. doi:10.1016/0011-2275(85)90019-0		

HA-NA systems (BAC = 2)

7.450	0.0880	0.8130	60.49	0.7723	0.9206	
12.02	0.1750	0.8810	63.03	0.8045	0.9243	
14.30	0.2170	0.9010	64.47	0.8247	0.9265	
17.13	0.2710	0.9170	66.82	0.8527	0.9303	
23.18	0.4400	0.9370	68.19	0.8677	0.9335	
27.05	0.5640	0.9400	69.02	0.8750	0.9354	
30.16	0.6590	0.9470	69.99	0.8866	0.9362	
32.25	0.7310	0.9500	71.16	0.8976	0.9398	
34.18	0.8100	0.9550	72.07	0.9072	0.9415	
			73.79	0.9240	0.9424	
			74.55	0.9300	0.9405	
			75.23	0.9388	0.9410	
			75.23	0.9377	0.9377	CRIT

Niesen, Vicki G., (Vapor + liquid) equilibria and coexisting densities of (carbon dioxide + n-butane) at 311 to 395 K, The Journal of Chemical Thermodynamics. 21 (1989) 915-923. doi:10.1016/0021-9614(89)90150-X

T / K = 311.09

P / bar	x ₁	y ₁
5.900	0.0245	0.3711
7.590	0.0444	0.4936
9.880	0.0722	0.6062
12.07	0.0998	0.6768
14.22	0.1227	0.7226
15.28	0.1361	0.7390
16.82	0.1540	0.7623
17.98	0.1675	0.7734
18.51	0.1756	0.7804
18.97	0.1805	0.7862
20.44	0.1998	0.7995
21.97	0.2190	0.8115
22.63	0.2283	0.8157
23.22	0.2352	0.8195
24.69	0.2535	0.8282
26.79	0.2810	0.8394
27.80	0.2948	0.8467
29.99	0.3231	0.8544
30.89	0.3393	0.8568
32.09	0.3552	0.8611
33.39	0.3757	0.8664
35.24	0.4010	0.8725
37.09	0.4255	0.8781
38.35	0.4456	0.8813
40.24	0.4720	0.8865
41.49	0.4903	0.8896
43.15	0.5171	0.8937
45.59	0.5527	0.8994
47.91	0.5873	0.9050
50.25	0.6235	0.9078
51.99	0.6493	0.9099
53.99	0.6806	0.9120
55.81	0.7065	0.9142
57.59	0.7330	0.9165

Hsu, Jack J. C. - Nagarajan, N. - Robinson, R. L., Equilibrium phase compositions, phase densities, and interfacial tensions for carbon dioxide + hydrocarbon systems. 1. Carbon dioxide + n-butane, Journal of Chemical & Engineering Data. 30 (1985) 485-491. doi:10.1021/je00042a036

T / K = 319.30

P / bar	x ₁	y ₁	
21.80	0.1880	0.7450	
25.85	0.2320	0.7780	
34.25	0.3350	0.8260	
35.45	0.3460	0.8300	
42.05	0.4280	0.8560	
48.95	0.5150	0.8730	
54.75	0.5920	0.8850	
66.05	0.7350	0.8960	
71.55	0.8000	0.8990	
72.60	0.8110	0.8980	
73.55	0.8240	0.8970	
74.35	0.8350	0.8960	
75.85	0.8550	0.8880	
76.20	0.8640	0.8820	
76.40	0.8730	0.8760	
76.25	0.8750	0.8750	CRIT

Pozo de Fernandez, Maria E. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the binary system carbon dioxide + n-butane, Journal of Chemical & Engineering Data. 34 (1989) 324-328. doi:10.1021/je00057a019

T / K = 325.01

P / bar	x ₁	y ₁
8.136	0.0288	0.2622
10.34	0.0506	0.3960
13.93	0.0863	0.5577
17.24	0.1204	0.6362
20.68	0.1553	0.6956

HA-NA systems (BAC = 2)

24.27	0.1918	0.7325	17.24	0.0740	0.4620	
27.72	0.2273	0.7634	20.69	0.1030	0.5360	
31.03	0.2665	0.7856	24.13	0.1320	0.5920	
34.47	0.3022	0.8034	27.58	0.1620	0.6350	
38.61	0.3497	0.8203	31.03	0.1920	0.6680	
44.89	0.4179	0.8388	34.48	0.2220	0.6940	
52.06	0.5017	0.8544	41.37	0.2830	0.7320	
58.61	0.5789	0.8657	48.26	0.3450	0.7540	
65.64	0.6620	0.8720	55.16	0.4090	0.7700	
68.95	0.7053	0.8722	62.05	0.4740	0.7800	
72.40	0.7433	0.8724	68.95	0.5430	0.7840	
75.57	0.7817	0.8687	75.84	0.6180	0.7780	
77.50	0.8063	0.8608	79.29	0.6610	0.7580	
			81.63	0.7130	0.7130	CRIT

Weber, Lloyd A., Simple apparatus for vapor-liquid equilibrium measurements with data for the binary systems of carbon dioxide with n-butane and isobutane, *Journal of Chemical & Engineering Data*. 34 (1989) 171-175. doi:10.1021/je00056a007

T / K = 344.26

P / bar	x ₁	y ₁
9.330	0.0091	0.0842
12.77	0.0391	0.2980
13.42	0.0446	0.3400
16.38	0.0699	0.4370
17.90	0.0822	0.4770
20.80	0.1083	0.5367
25.83	0.1520	0.6120
27.40	0.1660	0.6290
31.07	0.1980	0.6630
40.56	0.2820	0.7210
47.93	0.3510	0.7580
57.92	0.4430	0.7800
62.30	0.4830	0.7840
67.53	0.5350	0.7910
72.92	0.5900	0.7920
76.98	0.6320	0.7840
79.44	0.6640	0.7740
80.46	0.6810	0.7580
81.10	0.6940	0.7460

Olds, R. H. - Reamer, H. H. - Sage, B. H. - Lacey, W. N., The n-Butane-Carbon Dioxide System, *Industrial & Engineering Chemistry*. 41 (1949) 475-482. doi:10.1021/ie50471a011

T / K = 344.26

P / bar	x ₁	y ₁
8.619	0.0020	0.0300
10.34	0.0170	0.1730
12.07	0.0310	0.2770
13.79	0.0450	0.3550

Pozo de Fernandez, Maria E. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the binary system carbon dioxide + n-butane, *Journal of Chemical & Engineering Data*. 34 (1989) 324-328. doi:10.1021/je00057a019

T / K = 357.77

P / bar	x ₁	y ₁
14.82	0.0297	0.2165
19.03	0.0623	0.3622
23.51	0.0959	0.4577
27.44	0.1283	0.5182
31.16	0.1567	0.5645
36.40	0.1964	0.6028
42.89	0.2503	0.6469
49.57	0.3042	0.6785
56.40	0.3590	0.6973
63.57	0.4187	0.7107
70.67	0.4926	0.7139
75.43	0.5352	0.7116
77.91	0.5647	0.6986
79.29	0.5745	0.6893

Leu, Ah Dong - Robinson, Donald B., Equilibrium phase properties of the n-butane-carbon dioxide and isobutane-carbon dioxide binary systems, *Journal of Chemical & Engineering Data*. 32 (1987) 444-447. doi:10.1021/je00050a017

T / K = 368.15

P / bar	x ₁	y ₁
15.31	0.0099	0.0764
17.37	0.0243	0.1683
20.82	0.0478	0.2750
26.41	0.0878	0.4026
35.30	0.1568	0.5225
50.06	0.2631	0.6286
64.05	0.3782	0.6652

HA-NA systems (BAC = 2)

71.02	0.4320	0.6643		Engineering Data.	32	(1987)	444-447.
74.60	0.4811	0.6571		doi:10.1021/je00050a017			
77.98	0.5394	0.6206		T / K = 393.15			
79.01	0.5783	0.5783	CRIT	P / bar	x ₁	y ₁	
				23.92	0.0109	0.0506	
				25.92	0.0236	0.1016	
				29.51	0.0496	0.1828	
				34.82	0.0844	0.2661	
				43.99	0.1480	0.3686	
				59.36	0.2670	0.4495	
				65.36	0.3293	0.4422	
				65.84	0.3361	0.4304	
				67.71	0.3895	0.3895	CRIT
Hsu, Jack J. C. - Nagarajan, N. - Robinson, R. L., Equilibrium phase compositions, phase densities, and interfacial tensions for carbon dioxide + hydrocarbon systems. 1. Carbon dioxide + n-butane, Journal of Chemical & Engineering Data. 30 (1985) 485-491. doi:10.1021/je00042a036				Niesen, Vicki G., (Vapor + liquid) equilibria and coexisting densities of (carbon dioxide + n-butane) at 311 to 395 K, The Journal of Chemical Thermodynamics. 21 (1989) 915-923. doi:10.1016/0021-9614(89)90150-X			
				T / K = 394.60			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
28.80	0.0880	0.3400		24.79	0.0110	0.0678	
34.35	0.1290	0.4140		25.28	0.0156	0.0779	
41.65	0.1810	0.4810		27.81	0.0321	0.1440	
48.40	0.2300	0.5250		29.37	0.0440	0.1736	
55.45	0.2840	0.5560		31.18	0.0560	0.2051	
59.50	0.3150	0.5650		33.11	0.0687	0.2344	
62.65	0.3410	0.5710		34.25	0.0769	0.2511	
66.00	0.3680	0.5750		38.48	0.1082	0.3025	
69.15	0.3980	0.5730		40.41	0.1224	0.3165	
70.20	0.4060	0.5720		42.82	0.1379	0.3421	
71.75	0.4230	0.5690		44.62	0.1515	0.3542	
72.95	0.4340	0.5650		46.84	0.1685	0.3694	
74.25	0.4520	0.5540		48.66	0.1822	0.3808	
75.30	0.4730	0.5390		51.24	0.2016	0.3940	
75.65	0.4850	0.5270		53.12	0.2180	0.4014	
75.80	0.5100	0.5100	CRIT	54.47	0.2273	0.4070	
Poza de Fernandez, Maria E. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the binary system carbon dioxide + n-butane, Journal of Chemical & Engineering Data. 34 (1989) 324-328. doi:10.1021/je00057a019				Olds, R. H. - Reamer, H. H. - Sage, B. H. - Lacey, W. N., The n-Butane-Carbon Dioxide System, Industrial & Engineering Chemistry. 41 (1949) 475-482. doi:10.1021/ie50471a011			
				T / K = 410.93			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
26.27	0.0424	0.1789		56.68	0.2440	0.4121	
29.79	0.0673	0.2425		58.28	0.2573	0.4144	
35.99	0.1072	0.3283		59.78	0.2721	0.4170	
41.51	0.1503	0.3858		61.29	0.2867	0.4142	
46.33	0.1823	0.4213		63.18	0.3086	0.4084	
51.37	0.2175	0.4483		64.14	0.3230	0.3971	
56.12	0.2544	0.4691		64.71	0.3342	0.3918	
62.12	0.3059	0.4812		65.09	0.3535	0.3879	
64.95	0.3280	0.4811					
67.22	0.3528	0.4750					
68.05	0.3590	0.4685					
Leu, Ah Dong - Robinson, Donald B., Equilibrium phase properties of the n-butane-carbon dioxide and isobutane-carbon dioxide binary systems, Journal of Chemical &							

HA-NA systems (BAC = 2)

31.03	0.0060	0.0190		387.62	0.3000	0.4800
34.48	0.0270	0.0770		377.55	0.3260	0.5690
37.92	0.0490	0.1240		357.17	0.4090	0.7060
41.37	0.0730	0.1610		344.25	0.4730	0.7700
44.82	0.1000	0.1910		325.01	0.6200	0.8690
48.26	0.1310	0.2100				
51.71	0.1690	0.2050				
52.26	0.1880	0.1880	CRIT			

Leu, Ah Dong - Robinson, Donald B., Equilibrium phase properties of the n-butane-carbon dioxide and isobutane-carbon dioxide binary systems, *Journal of Chemical & Engineering Data*. 32 (1987) 444-447. doi:10.1021/je00050a017

T / K = 418.15

P / bar	x ₁	y ₁	
34.82	0.0131	0.0320	
37.16	0.0282	0.0632	
40.20	0.0494	0.0959	
43.58	0.0756	0.1209	
44.95	0.0858	0.1277	
46.26	0.1030	0.1314	
47.02	0.1206	0.1206	CRIT

Isobaric phase equilibrium data

Pozo de Fernandez, Maria E. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the binary system carbon dioxide + n-butane, *Journal of Chemical & Engineering Data*. 34 (1989) 324-328. doi:10.1021/je00057a019

P / bar = 41.37

T / K	x ₁	y ₁
418.48	0.0500	0.0870
410.93	0.0720	0.1610
397.89	0.1180	0.2840
387.62	0.1480	0.3850
377.55	0.1750	0.4810
357.17	0.2380	0.6380
344.25	0.2820	0.7220
325.01	0.3850	0.8250
292.60	0.7230	0.9450

Pozo de Fernandez, Maria E. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the binary system carbon dioxide + n-butane, *Journal of Chemical & Engineering Data*. 34 (1989) 324-328. doi:10.1021/je00057a019

P / bar = 62.05

T / K	x ₁	y ₁
397.89	0.2750	0.3690

Critical point

Morrison, G. - Kincaid, J. M., Critical point measurements on nearly polydisperse fluids, *AIChE Journal*. 30 (1984) 257-262. doi:10.1002/aic.690300213

T / K	P / bar	x ₁
306.15	73.36	0.9748
312.48	76.63	0.9144

Juntarachat, Niramol - Bello, Salma - Privat, Romain - Jaubert, Jean-Noël, Validation of a New Apparatus Using the Dynamic Method for Determining the Critical Properties of Binary Gas/Gas Mixtures, *Journal of Chemical & Engineering Data*. 58 (2013) 671-676. doi:10.1021/je301209u

T / K	P / bar	x ₁
309.41	72.24	0.9403
318.81	74.49	0.8732
342.29	80.12	0.7394
359.42	79.44	0.6355
377.29	74.26	0.5160
388.66	68.68	0.4303
398.71	62.04	0.3365
405.58	56.42	0.2651
412.48	50.00	0.1736
418.38	44.94	0.1052

Olds, R. H. - Reamer, H. H. - Sage, B. H. - Lacey, W. N., The n-Butane-Carbon Dioxide System, *Industrial & Engineering Chemistry*. 41 (1949) 475-482. doi:10.1021/ie50471a011

T / K	P / bar	x ₁
310.93	75.50	0.9400
325.93	79.08	0.8306
351.71	81.70	0.6666
377.21	75.36	0.5016
377.59	75.15	0.4980
398.76	62.81	0.3260
412.26	51.09	0.1727

Van Poolen, Lambert J. - Holcomb, Cynthia D., Critical temperatures, pressures, and densities for the mixtures CO₂-C₃H₈, CO₂-nC₄H₁₀, C₂H₆-C₃H₈, and C₃H₈-nC₄H₁₀, *Fluid Phase Equilibria*. 165 (1999) 157-168. doi:10.1016/S0378-3812(99)00275-7

T / K	P / bar	x_1
311.08	75.10	0.9403
319.29	76.27	0.8741
344.41	80.85	0.7190
377.57	75.77	0.5067
394.57	65.00	0.3746
410.90	51.49	0.1883

Horstmann, S. - Fischer, K. - Gmehling, J., Experimental Determination of Critical Points of Pure Components and Binary Mixtures Using a Flow Apparatus, Chemical Engineering & Technology. 22 (1999) 839-842. doi:10.1002/(SICI)1521-4125(199910)22:10<839::AID-CEAT839>3.0.CO;2-L

T / K	P / bar	x_1
311.42	73.96	0.9386
320.20	76.60	0.8814
331.99	79.41	0.8195
341.13	80.75	0.7637
352.20	80.94	0.7021
363.71	79.32	0.6403
374.35	75.95	0.5676
383.17	71.79	0.5008
394.68	65.13	0.4076
404.39	57.95	0.3025
410.60	52.26	0.2248
416.09	47.65	0.1533
421.28	42.10	0.0743

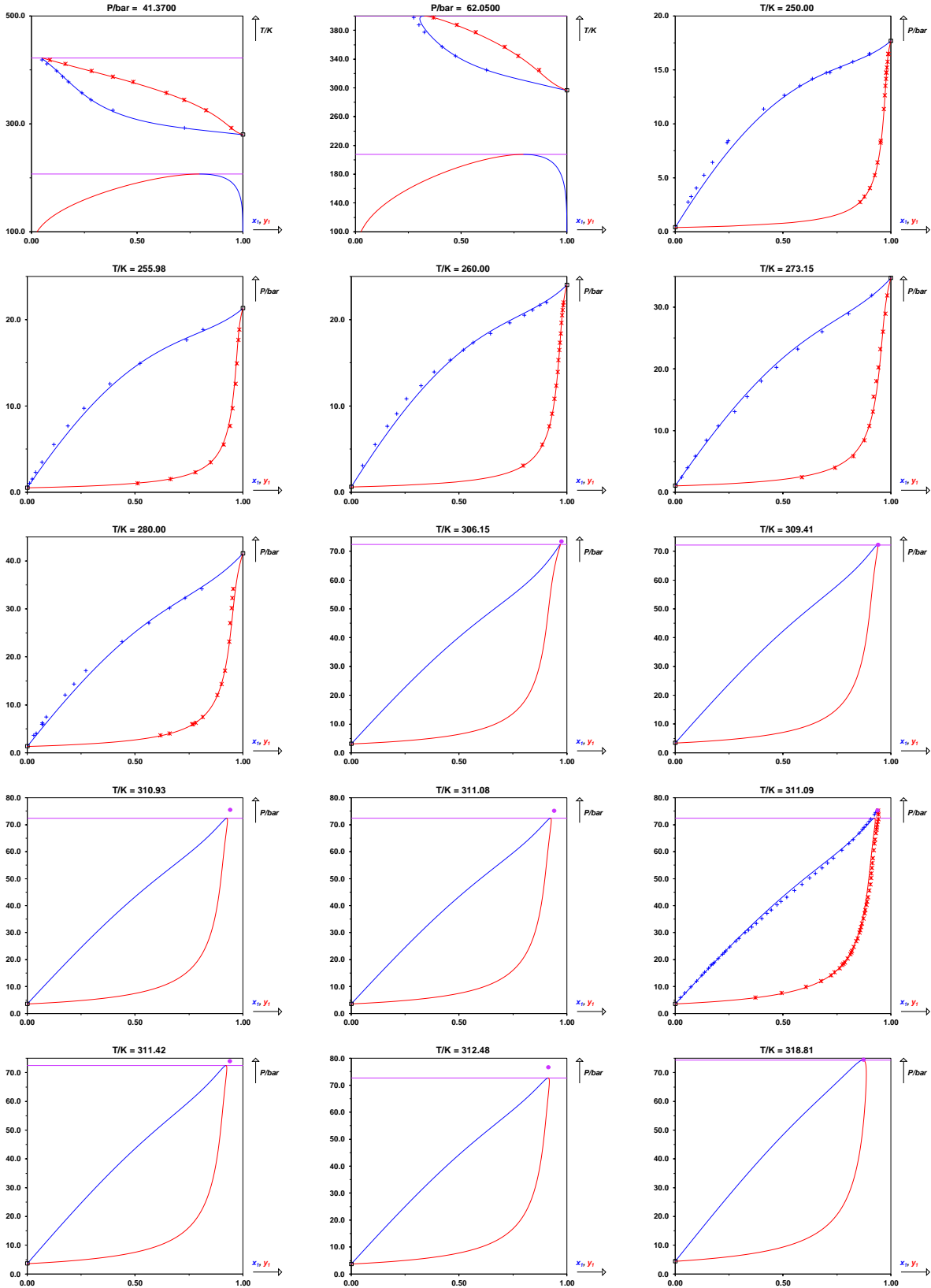
Hsu, Jack J. C. - Nagarajan, N. - Robinson, R. L., Equilibrium phase compositions, phase densities, and interfacial tensions for carbon dioxide + hydrocarbon systems. 1. Carbon dioxide + n-butane, Journal of Chemical & Engineering Data. 30 (1985) 485-491. doi:10.1021/je00042a036

T / K	P / bar	x_1
319.26	76.26	0.8750
344.26	81.22	0.7200

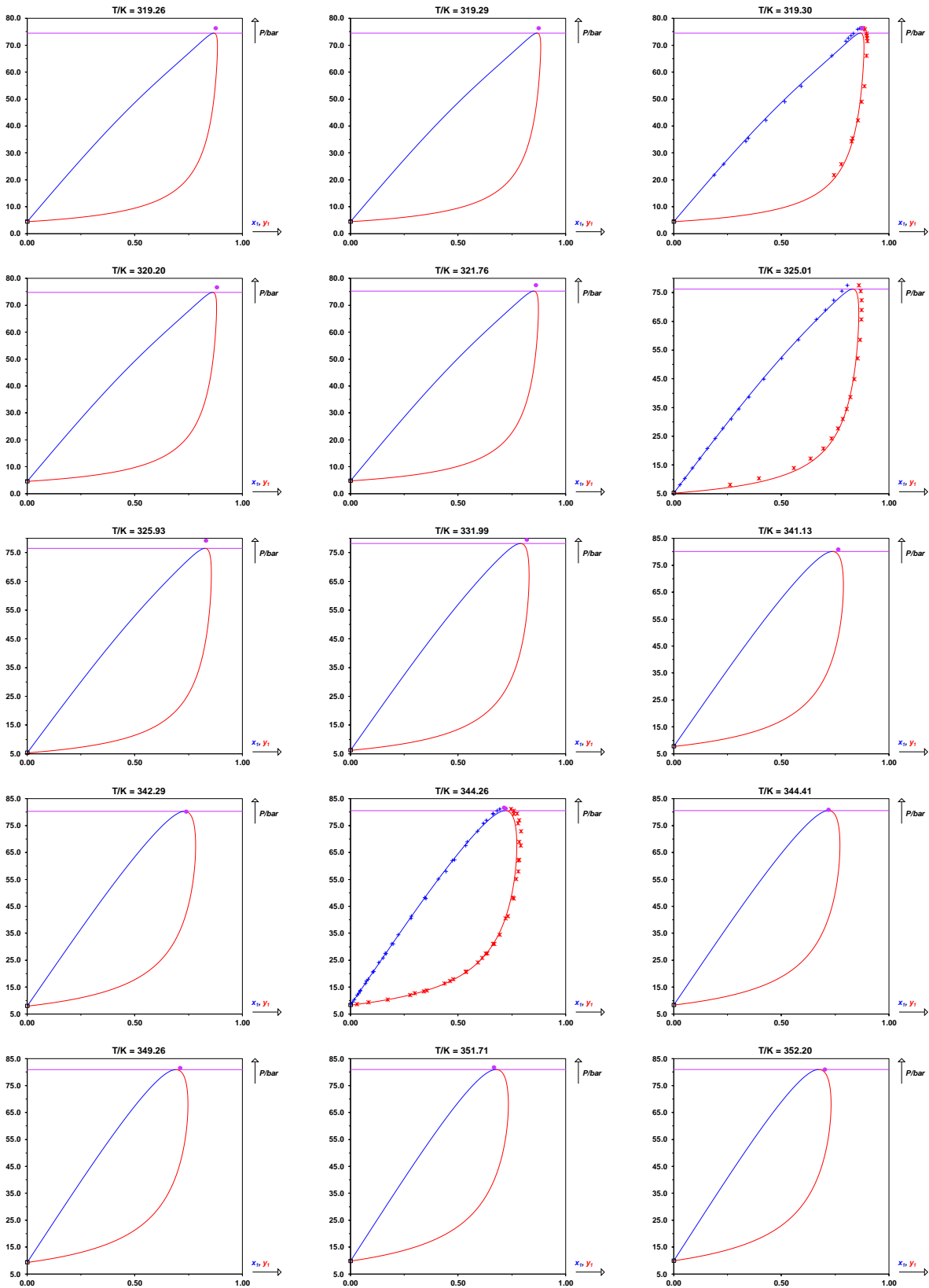
Poettmann, Fred H. - Katz, D. L., Phase Behavior of Binary Carbon Dioxide-Paraffin Systems, Industrial & Engineering Chemistry. 37 (1945) 847-853. doi:10.1021/ie50429a017

T / K	P / bar	x_1
321.76	77.36	0.8609
349.26	81.43	0.7102
385.09	74.26	0.4551
396.48	64.81	0.3761
415.82	48.88	0.1393

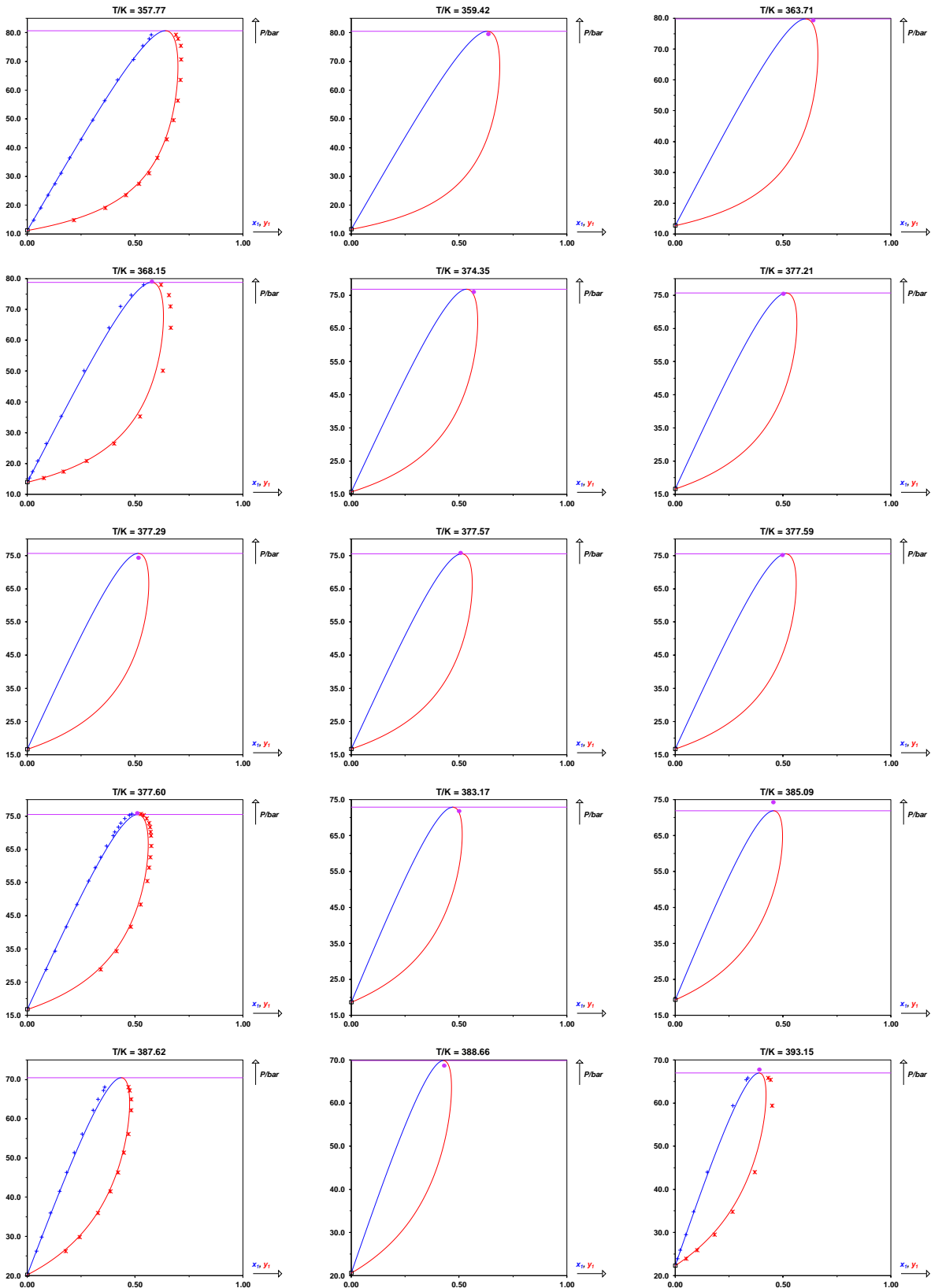
HA-NA systems (BAC = 2)



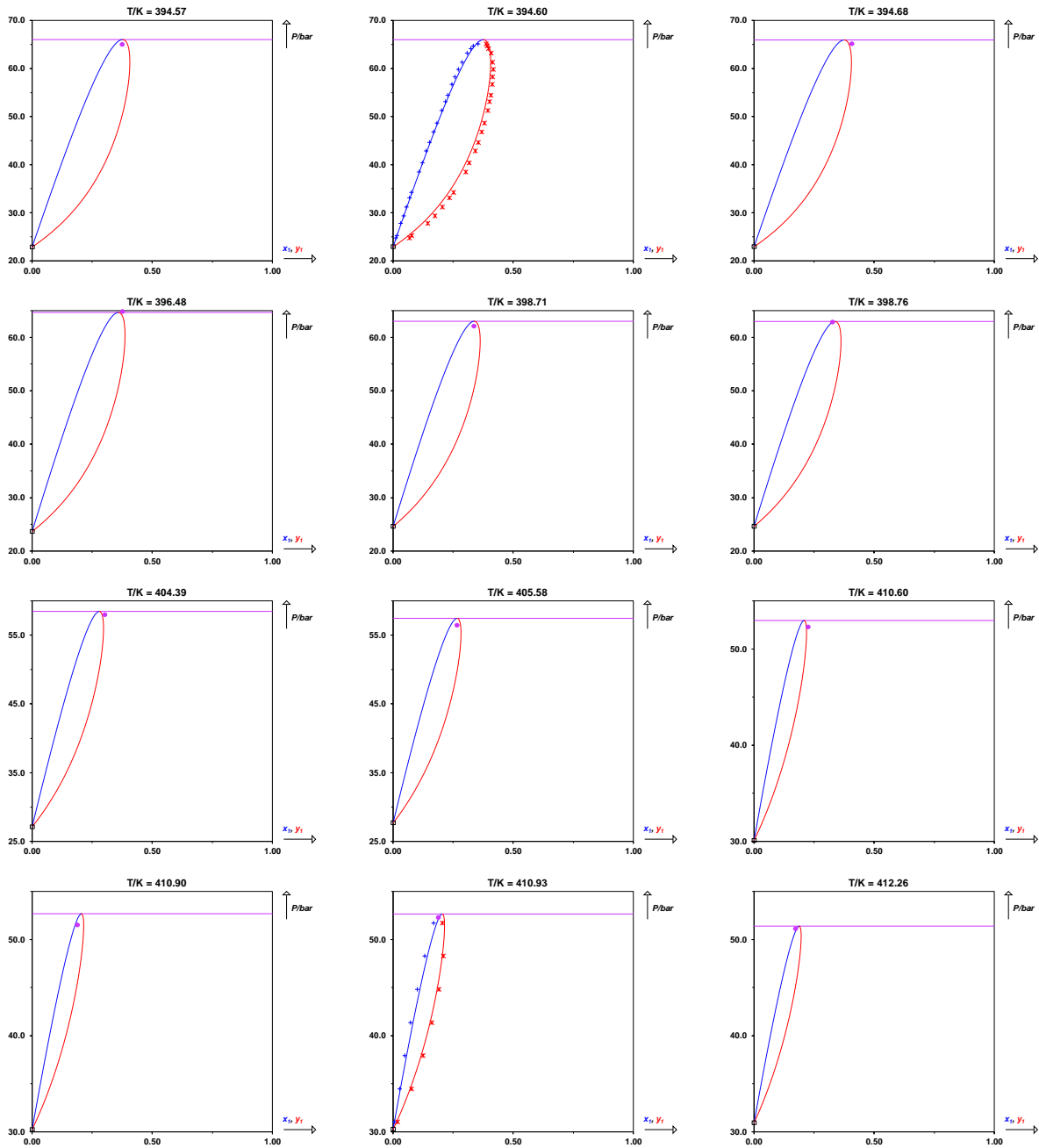
HA-NA systems (BAC = 2)



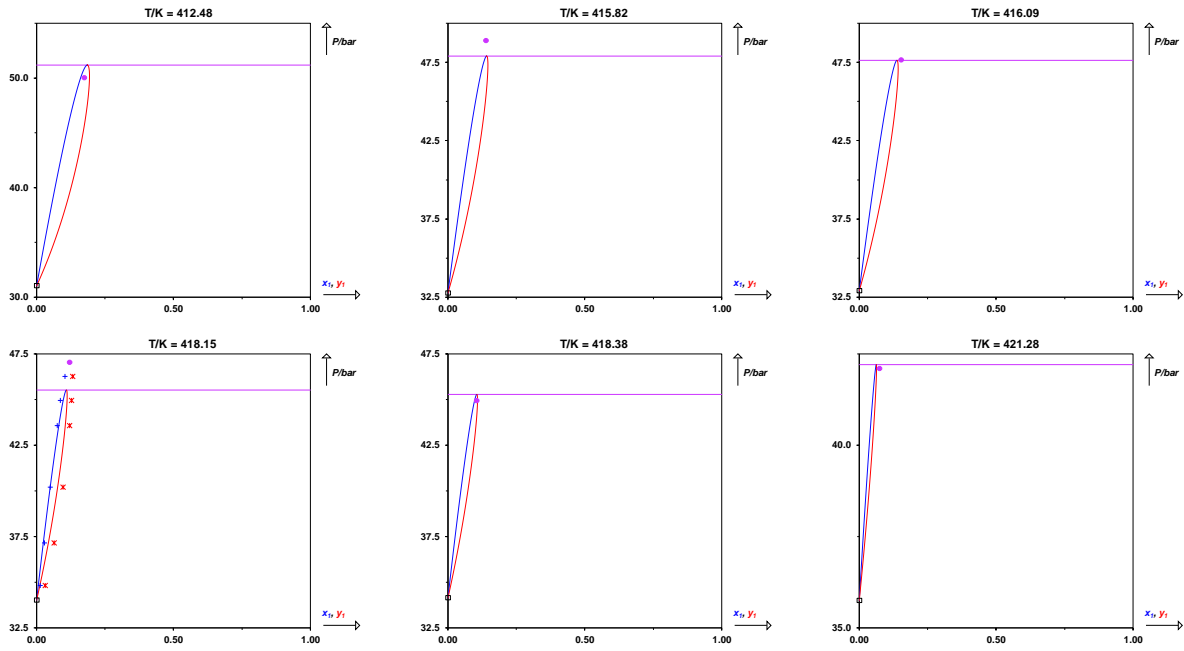
HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



CARBON DIOXIDE (1) + CYCLOPENTANE (2)

CAS	124-38-9	287-92-3
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	RGSFGYAAUTVSQA-UHFFFAOYSA-N
T_c / K	304.21	511.70
P_c / bar	73.83	45.10
ω	0.224	0.195

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 128.0$

$B/\text{MPa} = 145.5$

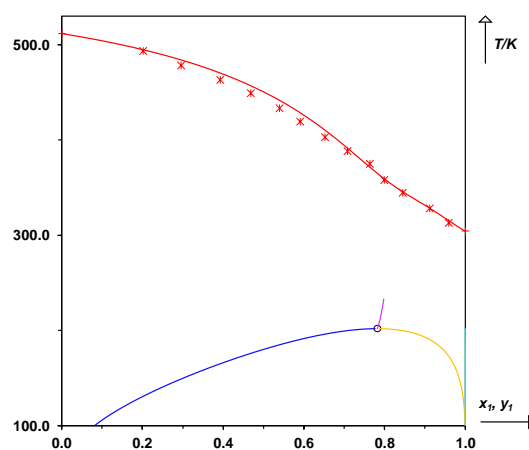
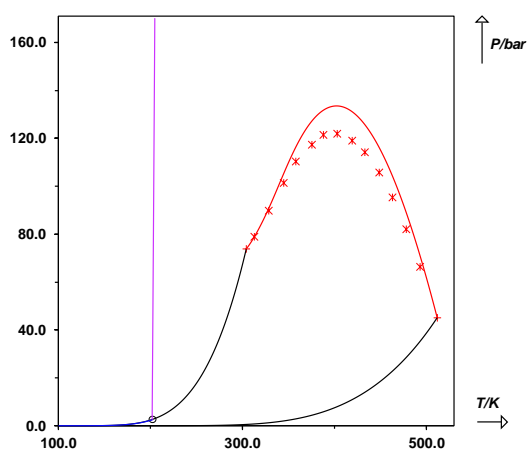
Deviations

MAPE on $x = 3.8\%$

MAPE on $y = 4.3\%$

MAPE on $x_c = 5.3\%$

MAPE on $P_c = 7.0\%$



-----				61.85	0.5130	0.9570	
Isothermal phase equilibrium data				68.88	0.5970	0.9530	
-----				88.53	0.8560	0.9480	
Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188- 192. doi:10.1021/je00002a014				89.70	0.9110	0.9110	CRIT
T / K = 313.08				Eckert, Catherine J. - Sandler, Stanley I., Vapor-liquid equilibria for the carbon dioxide-cyclopentane system at 37.7, 45.0, and 60.0.degree.C, Journal of Chemical & Engineering Data. 31 (1986) 26-28. doi:10.1021/je00043a008			
P / bar	x ₁	y ₁		T / K = 333.15			
3.310	0.0260	0.7580		P / bar	x ₁	y ₁	
6.830	0.0470	0.8760		10.67	0.0580	0.8120	
12.07	0.0900	0.9180		17.15	0.0990	0.8890	
18.55	0.1480	0.9420		24.95	0.1620	0.9290	
25.79	0.2160	0.9510		29.65	0.1870	0.9320	
32.96	0.2880	0.9560		35.45	0.2430	0.9410	
54.54	0.5790	0.9640		42.22	0.2860	0.9510	
75.36	0.9170	0.9630		48.76	0.3490	0.9560	
78.81	0.9520	0.9690		54.51	0.4180	0.9570	
78.80	0.9590	0.9590	CRIT	75.78	0.6480	0.9490	
Eckert, Catherine J. - Sandler, Stanley I., Vapor-liquid equilibria for the carbon dioxide-cyclopentane system at 37.7, 45.0, and 60.0.degree.C, Journal of Chemical & Engineering Data. 31 (1986) 26-28. doi:10.1021/je00043a008				82.63	0.7260	0.9490	
T / K = 318.15				Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188- 192. doi:10.1021/je00002a014			
P / bar	x ₁	y ₁		T / K = 344.70			
6.452	0.0480	0.8610		P / bar	x ₁	y ₁	
12.87	0.0980	0.9260		5.720	0.0210	0.5850	
18.04	0.1360	0.9470		9.930	0.0460	0.7650	
23.56	0.1950	0.9590		16.13	0.0790	0.8390	
38.00	0.3560	0.9730		23.30	0.1240	0.8770	
42.57	0.4080	0.9760		29.85	0.1650	0.8970	
59.64	0.6460	0.9750		37.16	0.2130	0.9100	
73.57	0.8440	0.9720		44.62	0.2620	0.9180	
Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188- 192. doi:10.1021/je00002a014				52.17	0.3190	0.9240	
T / K = 328.23				59.65	0.3800	0.9270	
P / bar	x ₁	y ₁		67.27	0.4400	0.9280	
5.030	0.0290	0.7180		74.83	0.5080	0.9270	
8.550	0.0510	0.8270		82.45	0.5800	0.9250	
20.62	0.1420	0.9060		89.93	0.6600	0.9190	
27.65	0.1960	0.9310		97.07	0.7420	0.9060	
34.34	0.2500	0.9360		101.12	0.8050	0.8840	
41.51	0.3080	0.9430		101.30	0.8450	0.8450	CRIT
48.19	0.3670	0.9500		Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188- 192. doi:10.1021/je00002a014			
55.16	0.4410	0.9550					

HA-NA systems (BAC = 2)

T / K = 358.06					
P / bar	x_1	y_1			
6.760	0.0200	0.4540	25.95	0.0940	0.7150
10.43	0.0400	0.6820	33.16	0.1280	0.7610
16.96	0.0750	0.7890	39.75	0.1600	0.7880
23.68	0.1130	0.8380	53.16	0.2230	0.8180
31.10	0.1540	0.8660	60.00	0.2590	0.8270
39.27	0.2020	0.8830	67.27	0.2980	0.8330
45.93	0.2410	0.8930	75.03	0.3390	0.8370
54.23	0.2940	0.9010	82.31	0.3730	0.8380
61.92	0.3430	0.9030	89.52	0.4150	0.8370
82.86	0.4930	0.9040	96.45	0.4560	0.8320
89.86	0.5480	0.8990	103.45	0.5000	0.8250
96.86	0.6080	0.8930	110.45	0.5480	0.8130
103.80	0.6730	0.8790	117.32	0.6080	0.7890
109.42	0.7430	0.8480	120.27	0.6430	0.7650
110.30	0.7990	0.7990	121.40	0.7070	0.7070
		CRIT			CRIT

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 375.15					
P / bar	x_1	y_1			
7.720	0.0170	0.4050			
11.76	0.0360	0.5890			
16.96	0.0600	0.6950			
24.71	0.0980	0.7700			
31.03	0.1290	0.8030			
38.85	0.1700	0.8330			
44.96	0.2020	0.8460			
52.24	0.2410	0.8550			
73.73	0.3650	0.8650			
80.32	0.4030	0.8620			
88.01	0.4540	0.8590			
96.18	0.5140	0.8480			
103.66	0.5750	0.8440			
110.52	0.6330	0.8370			
117.30	0.7630	0.7630			
		CRIT			

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 388.11					
P / bar	x_1	y_1			
9.100	0.0160	0.2990			
13.18	0.0340	0.5150			
19.98	0.0650	0.6570			

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 403.07					
P / bar	x_1	y_1			
10.02	0.0090	0.1670			
14.83	0.0280	0.4030			
21.28	0.0550	0.5520			
28.49	0.0860	0.6380			
35.63	0.1180	0.6900			
43.73	0.1540	0.7250			
51.97	0.1900	0.7510			
59.59	0.2250	0.7670			
67.07	0.2600	0.7760			
75.79	0.3020	0.7820			
83.34	0.3400	0.7830			
91.10	0.3800	0.7860			
98.65	0.4210	0.7790			
105.44	0.4630	0.7710			
112.17	0.5080	0.7560			
118.76	0.5620	0.7290			
122.00	0.6520	0.6520			
		CRIT			CRIT

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 419.15					
P / bar	x_1	y_1			
12.97	0.0090	0.1290			
16.82	0.0240	0.2940			
22.24	0.0450	0.4330			

HA-NA systems (BAC = 2)

29.31	0.0740	0.5400		43.52	0.0990	0.4550	
36.38	0.1050	0.6020		51.01	0.1300	0.5020	
44.69	0.1380	0.6520		58.42	0.1590	0.5320	
51.35	0.1680	0.6750		65.56	0.1900	0.5550	
58.42	0.1980	0.6950		72.56	0.2210	0.5700	
66.52	0.2330	0.7110		80.04	0.2550	0.5790	
73.38	0.2640	0.7170		87.32	0.2920	0.5810	
81.28	0.3010	0.7210		95.01	0.3330	0.5750	
89.24	0.3370	0.7250		102.35	0.3840	0.5490	
97.41	0.3820	0.7200		105.10	0.4190	0.5140	
105.44	0.4270	0.7110		105.80	0.4680	0.4680	CRIT
113.61	0.4830	0.6850					
117.80	0.5260	0.6520					
119.10	0.5910	0.5910	CRIT				

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 433.21

P / bar	x ₁	y ₁	
16.82	0.0120	0.1370	
20.11	0.0240	0.2470	
25.40	0.0450	0.3680	
32.26	0.0720	0.4700	
39.61	0.1010	0.5340	
47.02	0.1320	0.5800	
53.82	0.1600	0.6080	
61.65	0.1930	0.6320	
68.92	0.2240	0.6480	
75.58	0.2550	0.6570	
82.72	0.2880	0.6630	
90.20	0.3240	0.6640	
97.14	0.3580	0.6610	
104.00	0.3970	0.6460	
111.00	0.4510	0.6220	
112.93	0.4770	0.5970	
114.20	0.5400	0.5400	CRIT

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 448.81

P / bar	x ₁	y ₁	
20.18	0.0090	0.0760	
25.47	0.0280	0.2220	
29.79	0.0450	0.3050	
36.38	0.0710	0.3910	

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 463.23

P / bar	x ₁	y ₁	
26.84	0.0150	0.1050	
32.06	0.0350	0.2030	
38.58	0.0600	0.2940	
45.59	0.0900	0.3610	
53.48	0.1210	0.4100	
61.44	0.1540	0.4450	
68.99	0.1860	0.4670	
76.47	0.2220	0.4790	
83.82	0.2600	0.4810	
90.82	0.3050	0.4670	
93.98	0.3330	0.4460	
95.20	0.3920	0.3920	CRIT

Shah, Nilesh N. - Zollweg, John A. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide + cyclopentane from 275 to 493 K at pressures to 12.2 MPa, Journal of Chemical & Engineering Data. 36 (1991) 188-192. doi:10.1021/je00002a014

T / K = 478.17

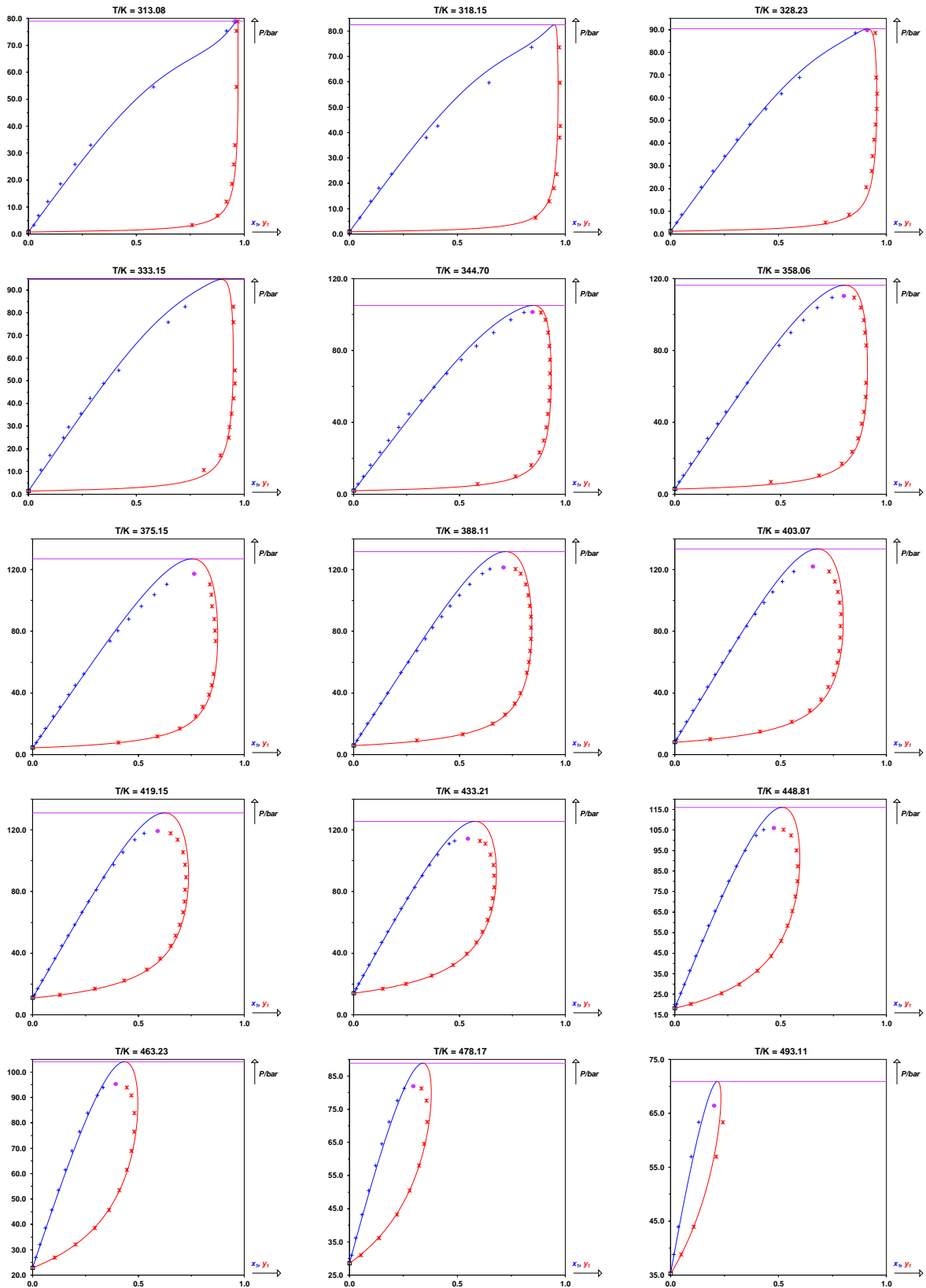
P / bar	x ₁	y ₁	
31.03	0.0100	0.0540	
36.11	0.0290	0.1370	
43.18	0.0570	0.2200	
50.46	0.0880	0.2790	
58.01	0.1200	0.3220	
64.53	0.1500	0.3460	
71.19	0.1840	0.3600	
77.57	0.2210	0.3570	
81.21	0.2540	0.3330	
81.90	0.2950	0.2950	CRIT

Shah, Nilesh N. - Zollweg, John A. - Streett, William B.,
Vapor-liquid equilibrium in the system carbon dioxide +
cyclopentane from 275 to 493 K at pressures to 12.2 MPa,
Journal of Chemical & Engineering Data. 36 (1991) 188-
192. doi:10.1021/je00002a014

T / K = 493.11

P / bar	x ₁	y ₁	
38.79	0.0140	0.0490	
43.93	0.0350	0.1070	
56.98	0.0960	0.2110	
63.36	0.1300	0.2420	
66.40	0.2020	0.2020	CRIT

HA-NA systems (BAC = 2)



CARBON DIOXIDE (1) + TOLUENE (2)

CAS	124-38-9	108-88-3
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	YXFVVABEGXRONW-UHFFFAOYSA-N
T_c / K	304.21	591.75
P_c / bar	73.83	41.08
ω	0.224	0.264

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 108.8$

$B/\text{MPa} = 324.2$

Deviations

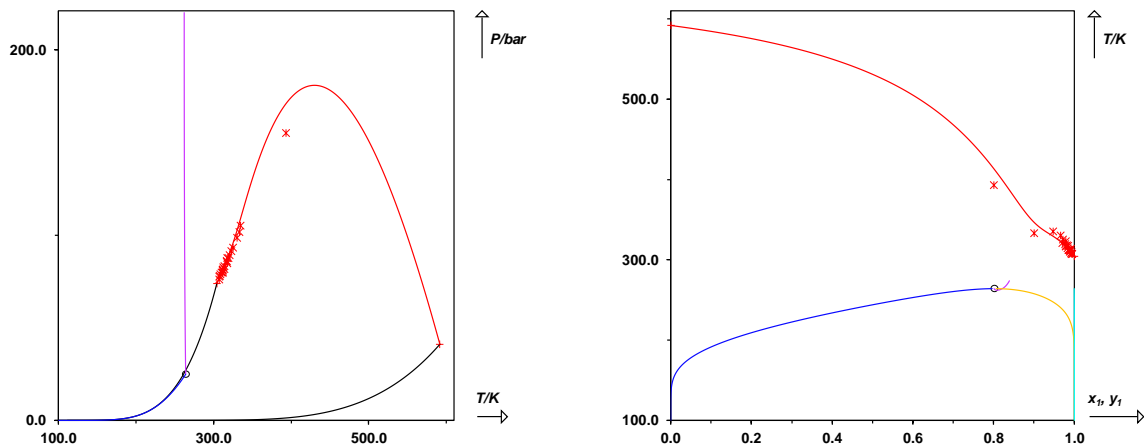
MAPE on $x = 9.8\%$

MAPE on $y = 9.8\%$

MAPE on $x_c = 12\%$

MAPE on $P_c = 1.7\%$

MAPE on $h^M = 16\%$



-----			63.21	0.7962	0.9945
Isothermal phase equilibrium data			66.38	0.8502	0.9951
-----			69.21	0.9082	0.9948
Hong, J.H. - Kobayashi, R., Multicomponent vapor-liquid equilibria measurements for the development of an extractive distillation process for the processing of gas issuing from a carbon dioxide/EOR project, Ind. Eng. Chem. Process Design Develop. 25 (1986) 584-589. doi:10.1021/i200033a041			Fink, Samuel D. - Hershey, Harry C., Modeling the vapor-liquid equilibria of 1,1,1-trichloroethane + carbon dioxide and toluene + carbon dioxide at 308, 323, and 353 K, Industrial & Engineering Chemistry Research. 29 (1990) 295-306. doi:10.1021/ie00098a022		
T / K = 263.14			T / K = 323.17		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
6.890	0.1494	0.9992	6.400	0.0426	0.9522
10.34	0.2373	0.9994	11.05	0.0786	0.9680
13.79	0.3201	0.9994	12.67	0.0857	0.9747
17.24	0.4425	0.9995	16.40	0.1211	0.9801
20.62	0.6133	0.9994	29.65	0.2197	0.9890
22.20	0.7456	0.9994	38.19	0.2846	0.9917
Naidoo, Paramespri - Ramjugernath, Deresh - Raal, Johan David, A new high-pressure vapour-liquid equilibrium apparatus, Fluid Phase Equilibria. 269 (2008) 104-112. doi:10.1016/j.fluid.2008.05.002			Park, S.D. - Kim, C.H. - Choi, C.S., Phase equilibria and mixture densities measurements of carbon dioxide-toluene system under high pressure, Hwahak Konghak. 28 (1990) 438-443.		
T / K = 283.15			T / K = 333.20		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
4.050	0.0578	0.9947	44.50	0.3482	0.9888
8.780	0.1274	0.9948	64.40	0.4944	0.9889
12.77	0.1928	0.9951	81.60	0.6441	0.9861
16.24	0.2511	0.9964	98.00	0.8169	0.9568
22.23	0.3709	0.9968	Fink, Samuel D. - Hershey, Harry C., Modeling the vapor-liquid equilibria of 1,1,1-trichloroethane + carbon dioxide and toluene + carbon dioxide at 308, 323, and 353 K, Industrial & Engineering Chemistry Research. 29 (1990) 295-306. doi:10.1021/ie00098a022		
29.40	0.5249	0.9981	T / K = 353.18		
35.32	0.6988	0.9989	P / bar	x ₁	y ₁
37.83	0.7980	0.9990	5.180	0.0232	0.8810
Fink, Samuel D. - Hershey, Harry C., Modeling the vapor-liquid equilibria of 1,1,1-trichloroethane + carbon dioxide and toluene + carbon dioxide at 308, 323, and 353 K, Industrial & Engineering Chemistry Research. 29 (1990) 295-306. doi:10.1021/ie00098a022			7.650	0.0375	0.9237
T / K = 308.16			7.770	0.0376	0.9197
P / bar	x ₁	y ₁	10.88	0.0567	0.9424
8.040	0.0627	0.9889	14.82	0.0784	0.9534
14.75	0.1229	0.9918	22.80	0.1235	0.9711
22.01	0.1886	0.9892	29.54	0.1631	0.9753
23.67	0.2110	0.9949	37.31	0.2093	0.9790
29.93	0.2745	0.9923	Fink, Samuel D. - Hershey, Harry C., Modeling the vapor-liquid equilibria of 1,1,1-trichloroethane + carbon dioxide and toluene + carbon dioxide at 308, 323, and 353 K, Industrial & Engineering Chemistry Research. 29 (1990) 295-306. doi:10.1021/ie00098a022		
32.00	0.2990	0.9956	T / K = 353.18		
38.43	0.3732	0.9944	P / bar	x ₁	y ₁
48.43	0.4923	0.9925	5.180	0.0232	0.8810
48.95	0.5118	0.9947	7.650	0.0375	0.9237
53.15	0.5724	0.9919	7.770	0.0376	0.9197
55.91	0.6288	0.9950	10.88	0.0567	0.9424
59.17	0.6896	0.9936	14.82	0.0784	0.9534

HA-NA systems (BAC = 2)

47.65	0.2683	0.9826
55.87	0.3137	0.9824
64.39	0.3645	0.9811
74.63	0.4191	0.9815
83.55	0.4769	0.9804
92.95	0.5352	0.9768
98.85	0.5885	0.9744
110.89	0.6750	0.9626
115.16	0.7194	0.9592
116.81	0.7385	0.9546
123.50	0.8301	0.9324

Park, S.D. - Kim, C.H. - Choi, C.S., Phase equilibria and mixture densities measurements of carbon dioxide-toluene system under high pressure, Hwahak Konghak. 28 (1990) 438-443.

T / K = 363.20

P / bar	x ₁	y ₁
39.80	0.2332	0.9753
60.80	0.3439	0.9776
83.50	0.4564	0.9761
103.00	0.5673	0.9727
123.80	0.6910	0.9612
133.00	0.7790	0.9432

Kim, Choon-Ho - Vimalchand, P. - Donohue, Marc D., Vapor-liquid equilibria for binary mixtures of carbon dioxide with benzene, toluene and p-xylene, Fluid Phase Equilibria. 31 (1986) 299-311. doi:10.1016/0378-3812(86)87014-5

T / K = 373.20

P / bar	x ₁	y ₁
5.150	0.0190	0.7540
12.56	0.0570	0.8820
20.16	0.0960	0.9360
29.31	0.1430	0.9530
37.47	0.1810	0.9620
45.77	0.2260	0.9670
54.89	0.2690	0.9690

Morris, William O. - Donohue, Marc D., Vapor-liquid equilibria in mixtures containing carbon dioxide, toluene, and 1-methylnaphthalene, Journal of Chemical & Engineering Data. 30 (1985) 259-263. doi:10.1021/je00041a007

T / K = 383.15

P / bar	x ₁	y ₁
5.930	0.0217	0.7710
9.720	0.0385	0.8470
19.05	0.0807	0.9080
31.80	0.1400	0.9380
48.15	0.2100	0.9510

64.05	0.2840	0.9550
113.00	0.5220	0.9530
128.00	0.6070	0.9360

Kim, Choon-Ho - Vimalchand, P. - Donohue, Marc D., Vapor-liquid equilibria for binary mixtures of carbon dioxide with benzene, toluene and p-xylene, Fluid Phase Equilibria. 31 (1986) 299-311. doi:10.1016/0378-3812(86)87014-5

T / K = 393.20

P / bar	x ₁	y ₁
13.13	0.0460	0.8390
18.09	0.0690	0.8770
26.77	0.1100	0.9220
34.92	0.1480	0.9360
43.41	0.1800	0.9450
52.72	0.2270	0.9490
64.50	0.2760	0.9520

Park, S.D. - Kim, C.H. - Choi, C.S., Phase equilibria and mixture densities measurements of carbon dioxide-toluene system under high pressure, Hwahak Konghak. 28 (1990) 438-443.

T / K = 393.20

P / bar	x ₁	y ₁
64.40	0.2922	0.9548
89.40	0.3955	0.9543
111.10	0.4898	0.9481
135.80	0.5950	0.9320
153.50	0.7016	0.8879

Morris, William O. - Donohue, Marc D., Vapor-liquid equilibria in mixtures containing carbon dioxide, toluene, and 1-methylnaphthalene, Journal of Chemical & Engineering Data. 30 (1985) 259-263. doi:10.1021/je00041a007

T / K = 413.15

P / bar	x ₁	y ₁
7.100	0.0176	0.6230
13.40	0.0409	0.7660
24.65	0.0835	0.8470
35.90	0.1300	0.8720
47.90	0.1770	0.9080
73.15	0.2860	0.9280
98.65	0.3830	0.9260
113.15	0.4370	0.9210
131.70	0.5460	0.9040

Ng, Heng-Joo - Robinson, Donald B., Equilibrium-phase properties of the toluene-carbon dioxide system, Journal of Chemical & Engineering Data. 23 (1978) 325-327. doi:10.1021/je60079a020

HA-NA systems (BAC = 2)

T / K =	477.04		$h^M / \text{J.mol}^{-1}$	z_1
P / bar	x_1	y_1	-172.00	0.0796
11.79	0.0127	0.2660	-299.00	0.1169
29.37	0.0722	0.6380	-493.00	0.1873
49.78	0.1400	0.7490	-649.00	0.2525
70.40	0.2090	0.7850	-832.00	0.3129
91.70	0.2760	0.7930	-1020.0	0.3691
119.07	0.3780	0.7870	-1150.0	0.4216
136.24	0.4450	0.7700	-1320.0	0.4706
152.24	0.5690	0.7160	-1440.0	0.5166
-----			-1590.0	0.5598
Enthalpy of mixing			-1700.0	0.6004
-----			-1810.0	0.6386
Wormald, C.J - Eyears, J.M, Excess molar enthalpies and excess molar volumes of { $x\text{CO}_2 + (1-x)\text{C}_6\text{H}_5\text{CH}_3$ } at 298.15, 304.10, and 308.15 K from 7.5 to 12.6 MPa, The Journal of Chemical Thermodynamics. 19 (1987) 845-856. doi:10.1016/0021-9614(87)90031-0			-1910.0	0.6747
T / K =	304.10		-1880.0	0.6747
P / bar =	76.00		-1960.0	0.7089
$h^M / \text{J.mol}^{-1}$	z_1		-1970.0	0.7413
-24.00	0.1450		-1980.0	0.7719
-42.00	0.2540		-1940.0	0.8011
-116.00	0.3980		-1900.0	0.8288
-250.00	0.4880		-1760.0	0.8552
-395.00	0.5570		-1540.0	0.8803
-450.00	0.6000		-1330.0	0.9043
-725.00	0.7150		-962.00	0.9272
-798.00	0.7530		-644.00	0.9492
-866.00	0.7950		Pando, C - Renuncio, J.A.R - Schofield, R.S - Izatt, R.M - Christensen, J.J, The excess enthalpies of (carbon dioxide + toluene) at 308.15, 385.15, and 413.15 K from 7.60 to 12.67 MPa, The Journal of Chemical Thermodynamics. 15 (1983) 747-755. doi:10.1016/0021-9614(83)90141-6	
-990.00	0.8670		T / K =	413.15
-941.00	0.8670		P / bar =	106.40
-960.00	0.8840		$h^M / \text{J.mol}^{-1}$	z_1
-938.00	0.8960		-118.00	0.0389
-962.00	0.8960		-298.00	0.0946
-923.00	0.9060		-478.00	0.1472
-964.00	0.9150		-624.00	0.1970
-916.00	0.9390		-791.00	0.2443
-765.00	0.9540		-923.00	0.2891
-665.00	0.9690		-1066.0	0.3317
-629.00	0.9710		-1178.0	0.3723
-492.00	0.9870		-1255.0	0.4109
Cordray, D.R - Christensen, J.J - Izatt, R.M, The excess enthalpies of (carbon dioxide + toluene) at 308.15, 358.15, and 573.15 K from 6.98 to 16.63 MPa, The Journal of Chemical Thermodynamics. 18 (1986) 647-656. doi:10.1016/0021-9614(86)90066-2			-1236.0	0.4234
T / K =	358.15		-1192.0	0.4357
P / bar =	138.80		-1153.0	0.4478
			-844.00	0.5167
			-686.00	0.5489
			-433.00	0.6094
			-171.00	0.6650

HA-NA systems (BAC = 2)

47.00	0.7165	325.10	93.20	0.9710
160.00	0.7407	330.20	98.50	0.9660
258.00	0.7641			
457.00	0.8084			
549.00	0.8294			
651.00	0.8496			
806.00	0.8882			
889.00	0.9065			
978.00	0.9242			
807.00	0.9414			
608.00	0.9580			
374.00	0.9742			
134.00	0.9898			

Zhang, J.C. - Wu, X.Y. - Cao, W.L., Phase Equilibrium Properties of Supercritical Carbon Dioxide in Binary System, Gaodeng Xuexiao Huaxue Xuebao. 23 (2002) 10-13.

T / K	P / bar	x ₁
307.25	77.60	0.9947
308.95	78.80	0.9929
311.55	81.20	0.9900
312.15	82.50	0.9863
317.75	87.70	0.9816
322.85	91.40	0.9785

Christensen, J.J - Zebolsky, D.M - Izatt, R.M, The excess enthalpies of (carbon dioxide + toluene) at 470.15 and 573.15 K from 7.60 to 12.67 MPa, The Journal of Chemical Thermodynamics. 17 (1985) 1-10. doi:10.1016/0021-9614(85)90025-4

T / K = **470.15**

P / bar = **126.70**

h^M / J.mol⁻¹

z ₁	
285.00	0.4653
540.00	0.5113
756.00	0.5545
1030.0	0.5952
1240.0	0.6337
1440.0	0.6701
1630.0	0.7045
1820.0	0.7371
1980.0	0.7682
2190.0	0.7977
2260.0	0.8119

Zhang, Haifei - Liu, Zhimin - Han, Buxing, Critical points and phase behavior of toluene-CO₂ and toluene-H₂-CO₂ mixture in CO₂-rich region, The Journal of Supercritical Fluids. 18 (2000) 185-192. doi:10.1016/S0896-8446(00)00081-4

T / K	P / bar	x ₁
308.05	77.82	0.9915
310.15	79.76	0.9893
311.95	81.27	0.9851
314.15	83.21	0.9823
316.65	85.64	0.9787
320.55	89.09	0.9694
335.05	105.00	0.9478

Wu, Weize - Ke, Jie - Poliakov, Martyn, Phase Boundaries of CO₂ + Toluene, CO₂ + Acetone, and CO₂ + Ethanol at High Temperatures and High Pressures, Journal of Chemical & Engineering Data. 51 (2006) 1398-1403. doi:10.1021/jc060099a

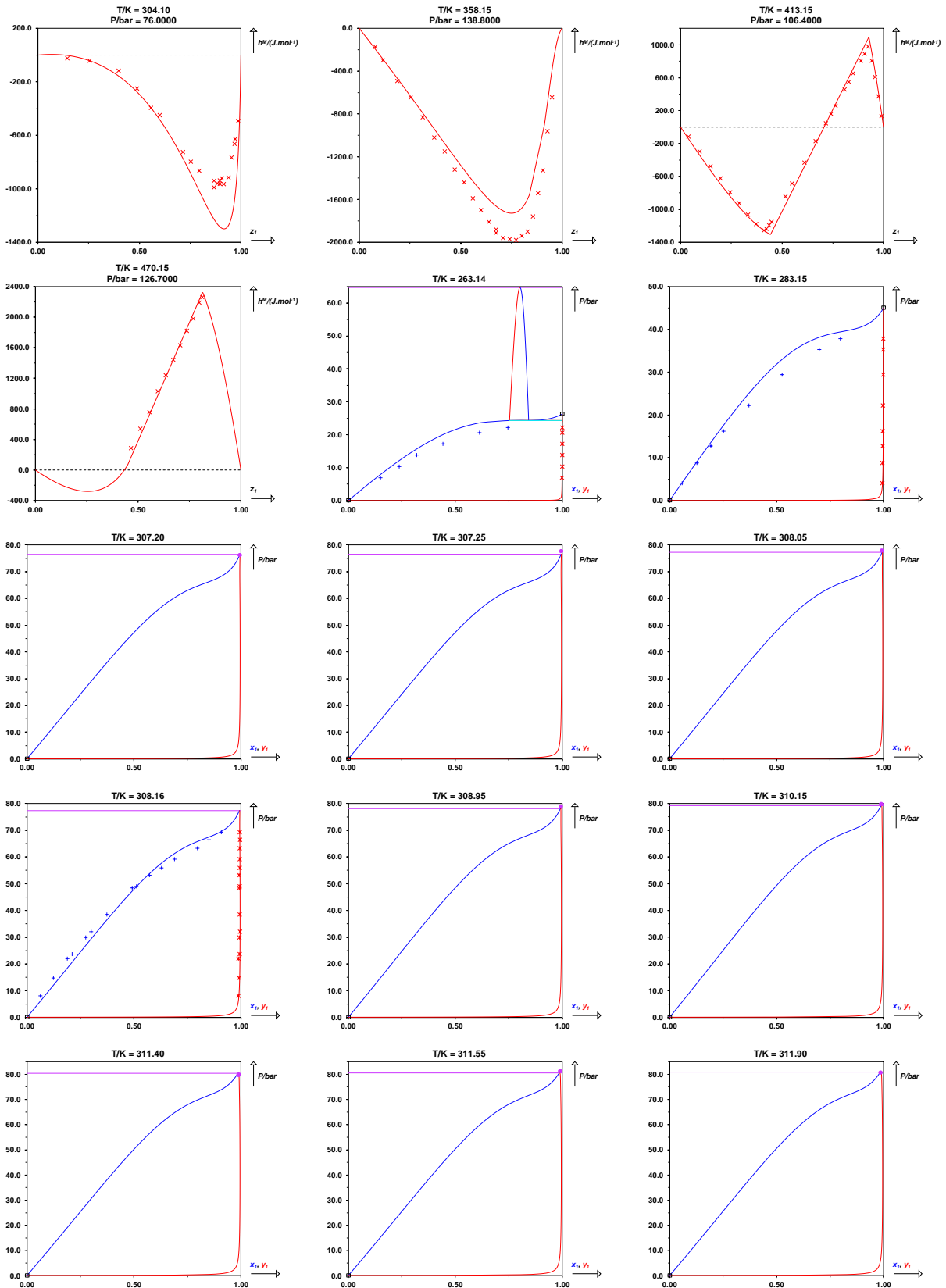
T / K	P / bar	x ₁
333.20	101.60	0.9000
393.20	155.10	0.8000

Critical point

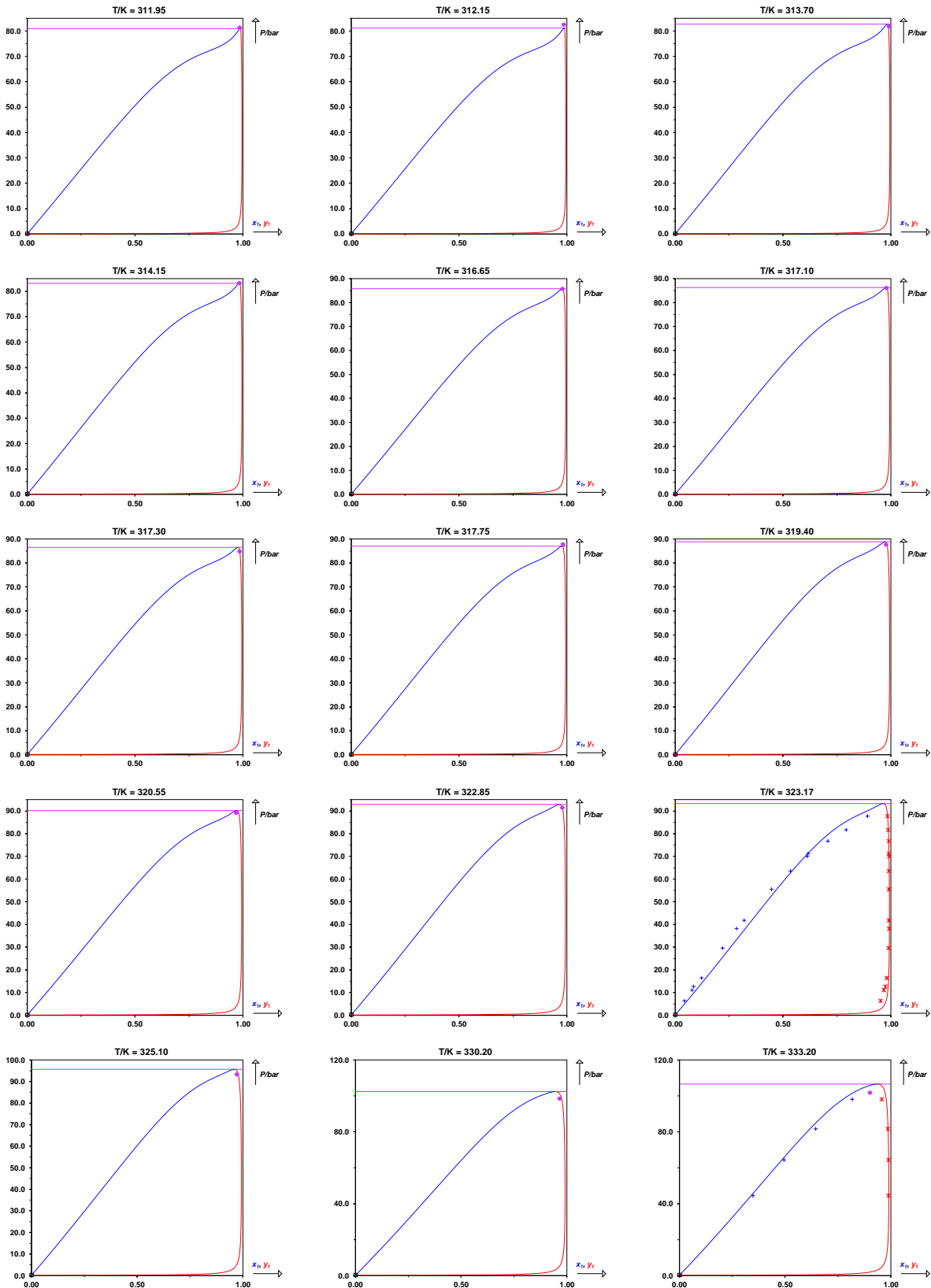
Reaves, J. Todd - Griffith, Aron T. - Roberts, Christopher B., Critical Properties of Dilute Carbon Dioxide + Entrainer and Ethane + Entrainer Mixtures, Journal of Chemical & Engineering Data. 43 (1998) 683-686. doi:10.1021/jc9702753

T / K	P / bar	x ₁
307.20	76.10	0.9950
311.40	79.80	0.9900
311.40	79.70	0.9890
311.90	80.60	0.9860
313.70	81.70	0.9910
317.10	86.00	0.9790
317.30	84.80	0.9840
319.40	87.60	0.9770

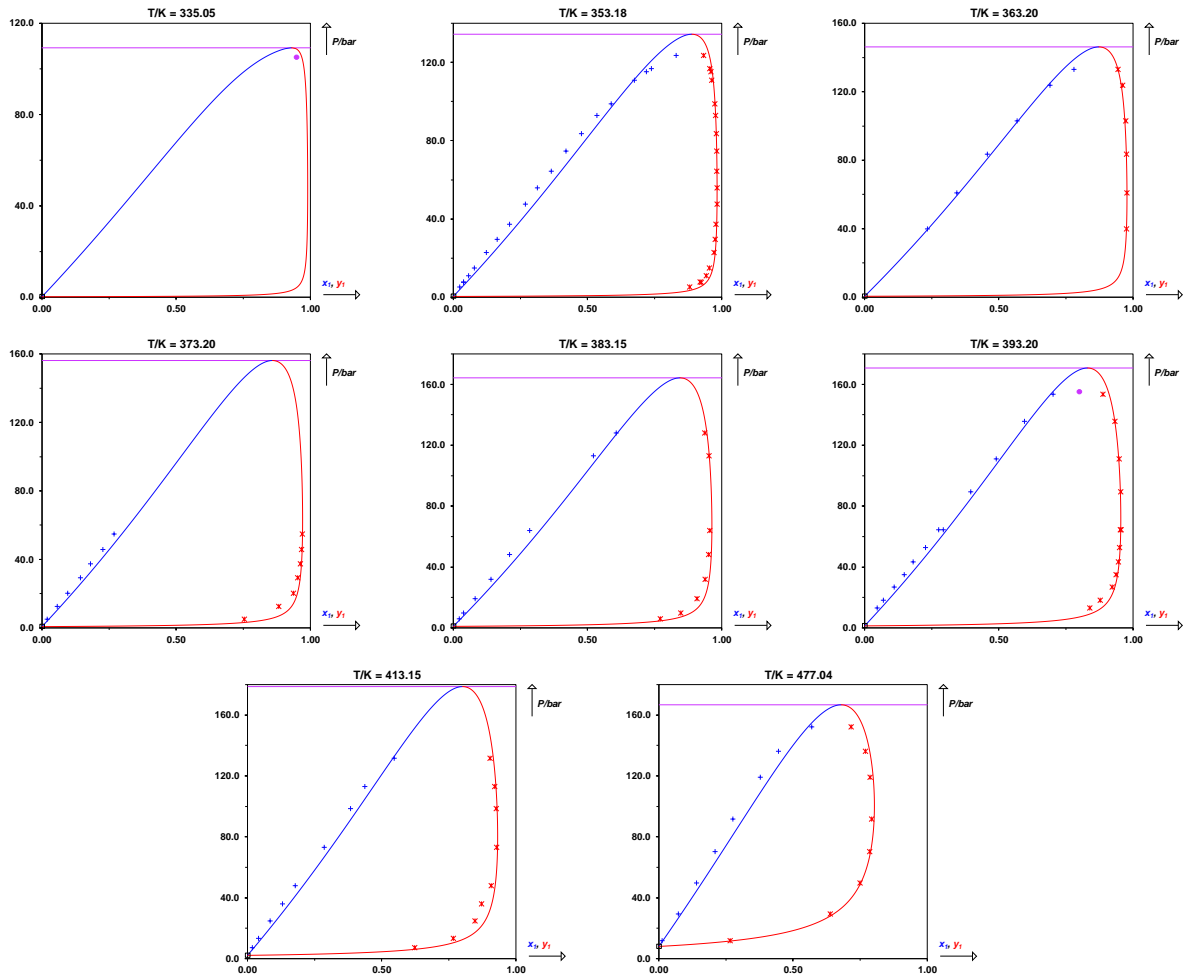
HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



CARBON DIOXIDE (1) + n-DECANE (2)

CAS	124-38-9	124-18-5
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	DIOQZVSQGTUSAI-UHFFFAOYSA-N
T_c / K	304.21	617.70
P_c / bar	73.83	21.10
ω	0.224	0.492

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 132.5

B/MPa = 286.7

Deviations

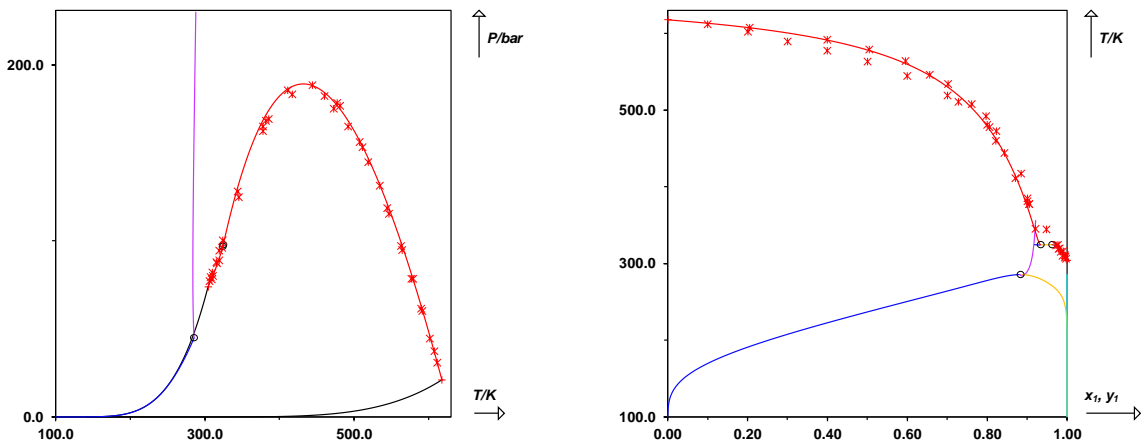
MAPE on x = 6.8 %

MAPE on y = 8.8 %

MAPE on x_c = 8.9 %

MAPE on P_c = 1.9 %

MAPE on h^M = 21 %



Isothermal phase equilibrium data

Jiménez-Gallegos, R. - Galicia-Luna, L. A. - Elizalde-Solis, O., Experimental Vapor-Liquid Equilibria for the Carbon Dioxide + Octane and Carbon Dioxide + Decane Systems, Journal of Chemical & Engineering Data. 51 (2006) 1624-1628. doi:10.1021/je060111z

T / K = 319.11		
P / bar	x ₁	y ₁
34.85	0.3395	0.9991
45.49	0.4243	0.9990
56.78	0.5262	0.9988
68.74	0.6338	0.9980
78.80	0.7336	0.9961
85.09	0.8847	0.9926
86.78	0.9240	0.9889
89.02	0.9731	0.9868

Iwai, Yoshio - Hosotani, Noriaki - Morotomi, Tatsuo - Koga, Yoshio - Arai, Yasuhiko, High-Pressure Vapor-Liquid Equilibria for Carbon Dioxide + Linalool, Journal of Chemical & Engineering Data. 39 (1994) 900-902. doi:10.1021/je00016a059

T / K = 344.30		
P / bar	x ₁	y ₁
55.10	0.3834	0.9975
85.50	0.5936	0.9968
118.50	0.8058	0.9877

Nagarajan, N. - Robinson, R. L., Equilibrium phase compositions, phase densities, and interfacial tensions for carbon dioxide + hydrocarbon systems. 2. Carbon dioxide + n-decane, Journal of Chemical & Engineering Data. 31 (1986) 168-171. doi:10.1021/je00044a012

T / K = 344.30		
P / bar	x ₁	y ₁
89.60	0.6150	0.9940
96.50	0.6570	0.9930
103.40	0.7020	0.9900
110.20	0.7530	0.9870
113.80	0.7750	0.9860
117.30	0.8040	0.9830
119.00	0.8150	0.9810
120.70	0.8340	0.9790
122.20	0.8470	0.9760
124.00	0.8660	0.9710
124.90	0.8770	0.9680
125.50	0.8830	0.9650
126.20	0.8860	0.9600
126.70	0.8930	0.9550
127.00	0.8970	0.9530

127.30 0.9180 0.9350

Reamer, H. H. - Sage, B. H., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the n-Decane-CO₂ System., Journal of Chemical & Engineering Data. 8 (1963) 508-513. doi:10.1021/je60019a010

T / K = 377.59		
P / bar	x ₁	y ₁
13.79	0.0931	0.9892
27.58	0.1774	0.9926
41.37	0.2549	0.9933
86.19	0.4798	0.9931
103.42	0.5602	0.9912
120.66	0.6394	0.9877
137.90	0.7173	0.9789
155.13	0.7968	0.9640

Reamer, H. H. - Sage, B. H., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the n-Decane-CO₂ System., Journal of Chemical & Engineering Data. 8 (1963) 508-513. doi:10.1021/je60019a010

T / K = 410.93		
P / bar	x ₁	y ₁
13.79	0.0796	0.9677
27.58	0.1548	0.9797
41.37	0.2240	0.9830
55.16	0.2879	0.9848
68.95	0.3476	0.9850
86.19	0.4183	0.9849
103.42	0.4878	0.9831
120.66	0.5576	0.9804
137.90	0.6277	0.9748
155.13	0.6954	0.9633
172.37	0.7635	0.9436

Reamer, H. H. - Sage, B. H., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the n-Decane-CO₂ System., Journal of Chemical & Engineering Data. 8 (1963) 508-513. doi:10.1021/je60019a010

T / K = 444.26		
P / bar	x ₁	y ₁
13.79	0.0683	0.9182
27.58	0.1372	0.9517
41.37	0.2018	0.9617
55.16	0.2623	0.9657
68.95	0.3195	0.9672
86.19	0.3865	0.9674
103.42	0.4510	0.9652
120.66	0.5156	0.9614

137.90 0.5795 0.9548
 155.13 0.6461 0.9427
 172.37 0.7170 0.9220

Reamer, H. H. - Sage, B. H., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the n-Decane-CO₂ System., Journal of Chemical & Engineering Data. 8 (1963) 508-513. doi:10.1021/je60019a010

T / K = 477.59

P / bar	x ₁	y ₁
13.79	0.0578	0.8231
27.58	0.1238	0.9017
41.37	0.1861	0.9255
55.16	0.2445	0.9346
68.95	0.2993	0.9377
86.19	0.3650	0.9379
103.42	0.4304	0.9353
120.66	0.4952	0.9292
137.90	0.5605	0.9177
155.13	0.6287	0.8978
172.37	0.7178	0.8545

Reamer, H. H. - Sage, B. H., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the n-Decane-CO₂ System., Journal of Chemical & Engineering Data. 8 (1963) 508-513. doi:10.1021/je60019a010

T / K = 510.93

P / bar	x ₁	y ₁
13.79	0.0450	0.6548
27.58	0.1104	0.8116
41.37	0.1730	0.8578
55.16	0.2308	0.8684
68.95	0.2868	0.8724
86.19	0.3550	0.8739
103.42	0.4206	0.8706
120.66	0.4880	0.8608
137.90	0.5717	0.8347

Inomata, Hiroshi - Tuchiya, Kazuhiro - Arai, Kunio - Saito, Shozaburo, Measurement of vapor-liquid equilibria at elevated temperatures and pressures using a flow type apparatus., Journal of Chemical Engineering of Japan. 19 (1986) 386-391. doi:10.1252/jcej.19.386

T / K = 520.40

P / bar	x ₁	y ₁
30.90	0.1110	0.7990
46.10	0.1870	0.8320
60.80	0.2470	0.8510
90.50	0.3760	0.8650
119.10	0.4930	0.8400

139.70 0.6060 0.7830

Sebastian, Herbert M. - Simnick, James J. - Lin, Ho-Mu - Chao, Kwang-Chu, Vapor-liquid equilibrium in binary mixtures of carbon dioxide + n-decane and carbon dioxide + n-hexadecane, Journal of Chemical & Engineering Data. 25 (1980) 138-140. doi:10.1021/je60085a012

T / K = 542.95

P / bar	x ₁	y ₁
19.64	0.0656	0.5700
30.02	0.1147	0.6818
40.02	0.1628	0.7357
51.68	0.2145	0.7655

Sebastian, Herbert M. - Simnick, James J. - Lin, Ho-Mu - Chao, Kwang-Chu, Vapor-liquid equilibrium in binary mixtures of carbon dioxide + n-decane and carbon dioxide + n-hexadecane, Journal of Chemical & Engineering Data. 25 (1980) 138-140. doi:10.1021/je60085a012

T / K = 583.65

P / bar	x ₁	y ₁
20.02	0.0427	0.2489
30.40	0.0974	0.4115
41.04	0.1558	0.5015
51.07	0.2125	0.5419

Enthalpy of mixing

Pando, C. - Renuncio, J.A.R. - McFall, T.A. - Izatt, R.M. - Christensen, J.J., The excess enthalpies of (carbon dioxide + decane) from 283.15 to 323.15 K at 7.58 MPa, The Journal of Chemical Thermodynamics. 15 (1983) 173-180. doi:10.1016/0021-9614(83)90157-X

T / K = 283.15

P / bar = 75.80

h ^M / J.mol ⁻¹	z ₁
293.00	0.0631
411.00	0.0631
627.00	0.1480
890.00	0.1480
974.00	0.2230
977.00	0.2230
1155.0	0.2897
1321.0	0.3495
1336.0	0.3495
1424.0	0.4033
1441.0	0.4521
1476.0	0.4964
1446.0	0.5369
1412.0	0.6083
1375.0	0.6692

HA-NA systems (BAC = 2)

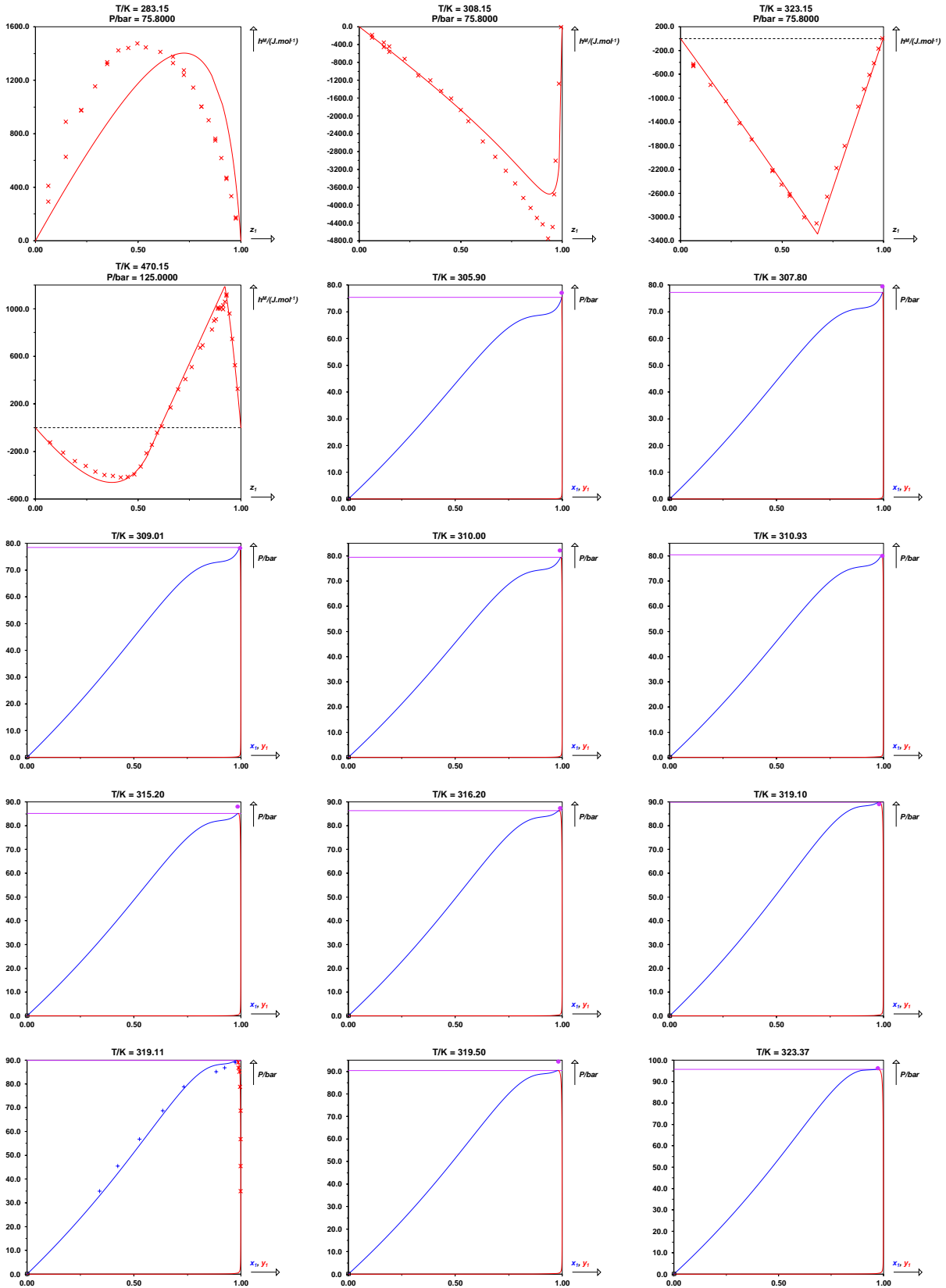
1329.0	0.6692	-5.100	0.9939
1241.0	0.7217		
1274.0	0.7217		
1146.0	0.7674		
1002.0	0.8077		
1002.0	0.8077		
901.00	0.8434		
749.00	0.8752		
762.00	0.8752		
619.00	0.9038		
461.00	0.9296		
471.00	0.9296		
333.00	0.9530		
166.00	0.9743		
175.00	0.9743		
Pando, C. - Renuncio, J.A.R. - McFall, T.A. - Izatt, R.M. - Christensen, J.J., The excess enthalpies of (carbon dioxide + decane) from 283.15 to 323.15 K at 7.58 MPa, The Journal of Chemical Thermodynamics. 15 (1983) 173-180. doi:10.1016/0021-9614(83)90157-X			
	T / K = 308.15		
	P / bar = 75.80		
	$h^M / J.mol^{-1}$	z_1	
-246.00	0.0631	-464.00	0.0631
-182.00	0.0631	-428.00	0.0631
-457.00	0.1209	-453.00	0.0631
-354.00	0.1209	-778.00	0.1480
-563.00	0.1480	-1053.0	0.2230
-442.00	0.1480	-1422.0	0.2897
-723.00	0.2230	-1697.0	0.3495
-1097.0	0.2897	-2226.0	0.4521
-1205.0	0.3495	-2214.0	0.4521
-1442.0	0.4033	-2458.0	0.4964
-1612.0	0.4522	-2644.0	0.5369
-1870.0	0.4996	-2617.0	0.5369
-2117.0	0.5371	-3006.0	0.6083
-2572.0	0.6083	-3106.0	0.6692
-2920.0	0.6693	-2660.0	0.7217
-3228.0	0.7218	-2175.0	0.7674
-3516.0	0.7676	-1808.0	0.8077
-3839.0	0.8078	-1146.0	0.8752
-4064.0	0.8435	-851.00	0.9038
-4291.0	0.8753	-612.00	0.9296
-4434.0	0.9038	-412.00	0.9530
-4750.0	0.9296	-168.00	0.9743
-4490.0	0.9530	4.900	0.9939
-3761.0	0.9603		
-3010.0	0.9675		
-1276.0	0.9843		
Christensen, J.J. - Cordray, D. - Izatt, R.M., The excess enthalpies of (carbon dioxide + decane) from 293.15 to 573.15 K at 12.50 MPa, The Journal of Chemical Thermodynamics. 18 (1986) 53-61. doi:10.1016/0021-9614(86)90043-1			
	T / K = 470.15		
	P / bar = 125.00		
	$h^M / J.mol^{-1}$	z_1	
		-124.00	0.0705
		-211.00	0.1340
		-280.00	0.1917
		-322.00	0.2442
		-369.00	0.2922
		-398.00	0.3363
		-405.00	0.3769
		-419.00	0.4144
		-414.00	0.4492

-392.00	0.4815			
-326.00	0.5117			
-215.00	0.5399			
-143.00	0.5662			
-43.00	0.5910			
11.00	0.6142			
168.00	0.6568			
321.00	0.6948			
408.00	0.7290			
510.00	0.7599			
673.00	0.8010			
694.00	0.8135			
825.00	0.8584			
898.00	0.8685			
911.00	0.8782			
1000.0	0.8876			
1010.0	0.8876			
1000.0	0.8966			
1010.0	0.9052			
1030.0	0.9136			
997.00	0.9136			
1060.0	0.9217			
1120.0	0.9294			
1110.0	0.9294			
961.00	0.9442			
746.00	0.9580			
526.00	0.9710			
328.00	0.9831			

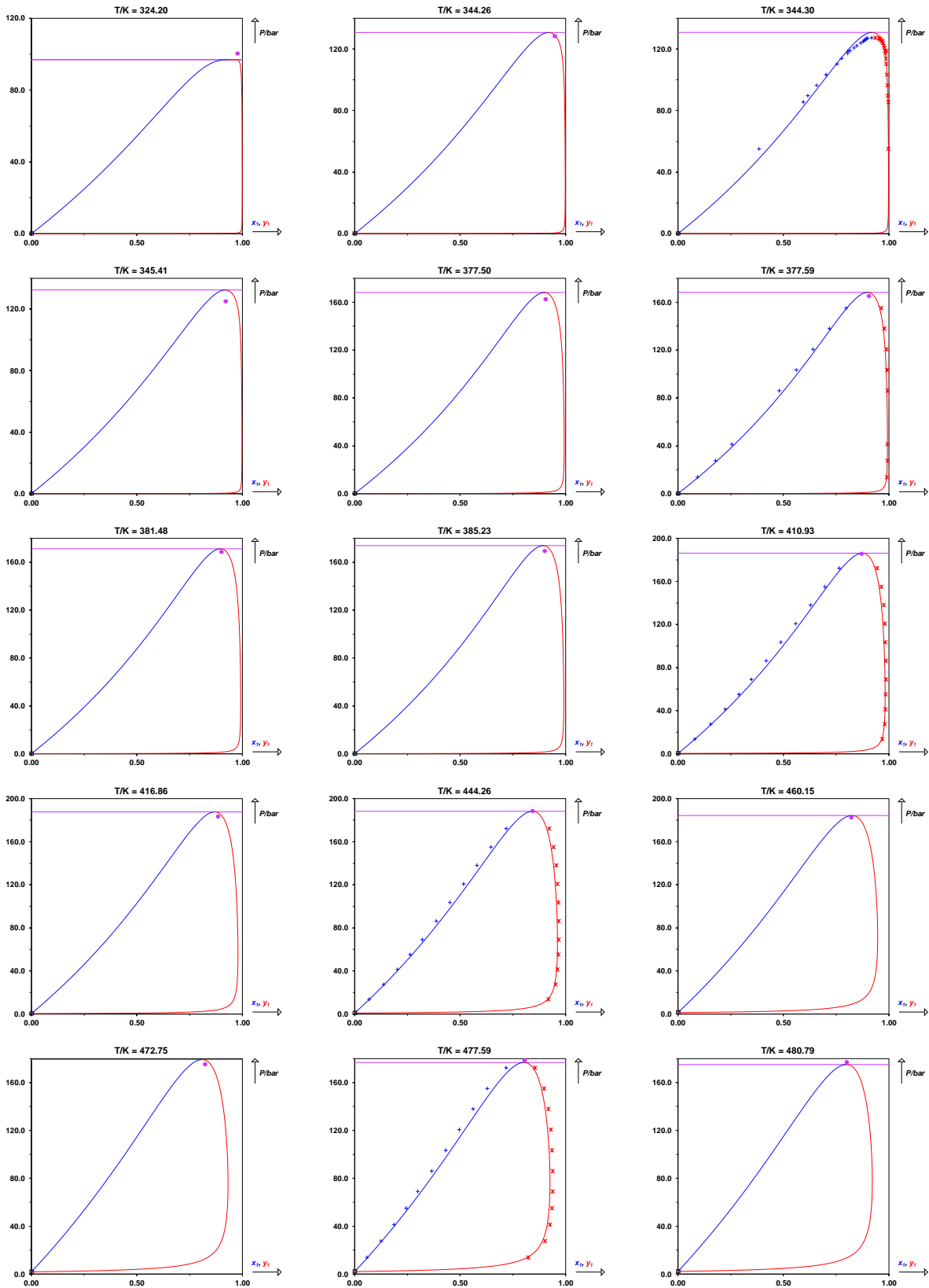
Critical point				

Gurdial, Gurdev S. - Foster, Neil R. - Yun, S. L. Jimmy - Tilly, Kevin D., Phase Behavior of Supercritical Fluid—Entrainers Systems, <i>Supercritical Fluid Engineering Science</i> . 514 (1992) 34-45.				
T / K	P / bar	x ₁		
305.90	77.00	0.9971		
307.80	79.40	0.9941		
310.00	82.10	0.9880		
315.20	88.00	0.9845		
319.50	94.30	0.9809		
324.20	100.30	0.9773		
Gulari, Es. - Saad, H. - Bae, Y. C., Effect of Critical Phenomena on Transport Properties in the Supercritical Region, <i>Supercritical Fluids</i> . 329 (1987) 2-14.				
T / K	P / bar	x ₁		
309.01	78.20	0.9960		
316.20	87.30	0.9900		
319.10	89.00	0.9790		
323.37	96.10	0.9720		
Reamer, H. H. - Sage, B. H., Phase Equilibria in Hydrocarbon Systems. Volumetric and Phase Behavior of the n-Decane-CO ₂ System., <i>Journal of Chemical & Engineering Data</i> . 8 (1963) 508-513. doi:10.1021/je60019a010				
T / K	P / bar	x ₁		
310.93	79.98	0.9946		
344.26	128.24	0.9477		
377.59	164.92	0.9046		
381.48	168.37	0.9000		
410.93	185.61	0.8705		
444.26	188.36	0.8430		
477.59	178.37	0.8050		
480.79	176.78	0.8000		
510.93	153.34	0.7280		
519.26	144.86	0.7000		
544.68	118.59	0.6000		
563.01	97.22	0.5000		
577.04	78.60	0.4000		
589.54	61.36	0.3000		
601.76	44.61	0.2000		
611.76	30.89	0.1000		
Juntarachat, Niramol - Bello, Salma - Privat, Romain - Jaubert, Jean-Noël, Validation of a new apparatus using the dynamic method for determining the critical properties of binary mixtures containing CO ₂ and a n-alkane, <i>Fluid Phase Equilibria</i> . 325 (2012) 66-70. doi:10.1016/j.fluid.2012.04.010				
T / K	P / bar	x ₁		
345.41	124.85	0.9201		
385.23	169.22	0.9008		
416.86	183.36	0.8852		
472.75	175.02	0.8223		
492.23	165.09	0.7970		
507.65	156.15	0.7613		
534.04	131.23	0.7016		
546.30	115.24	0.6555		
564.13	94.83	0.5946		
578.84	78.36	0.5048		
591.43	60.21	0.3987		
607.32	37.39	0.2051		
Polikhronidi, N. G. - Batyrova, R. G. - Abdulagatov, I. M. - Stepanov, G. V., Isochoric Heat Capacity of CO ₂ + n-Decane Mixtures in the Critical Region, <i>International Journal of Thermophysics</i> . 27 (2006) 729-759. doi:10.1007/s10765-006-0056-z				
T / K	P / bar	x ₁		
377.50	162.50	0.9050		
460.15	182.30	0.8220		

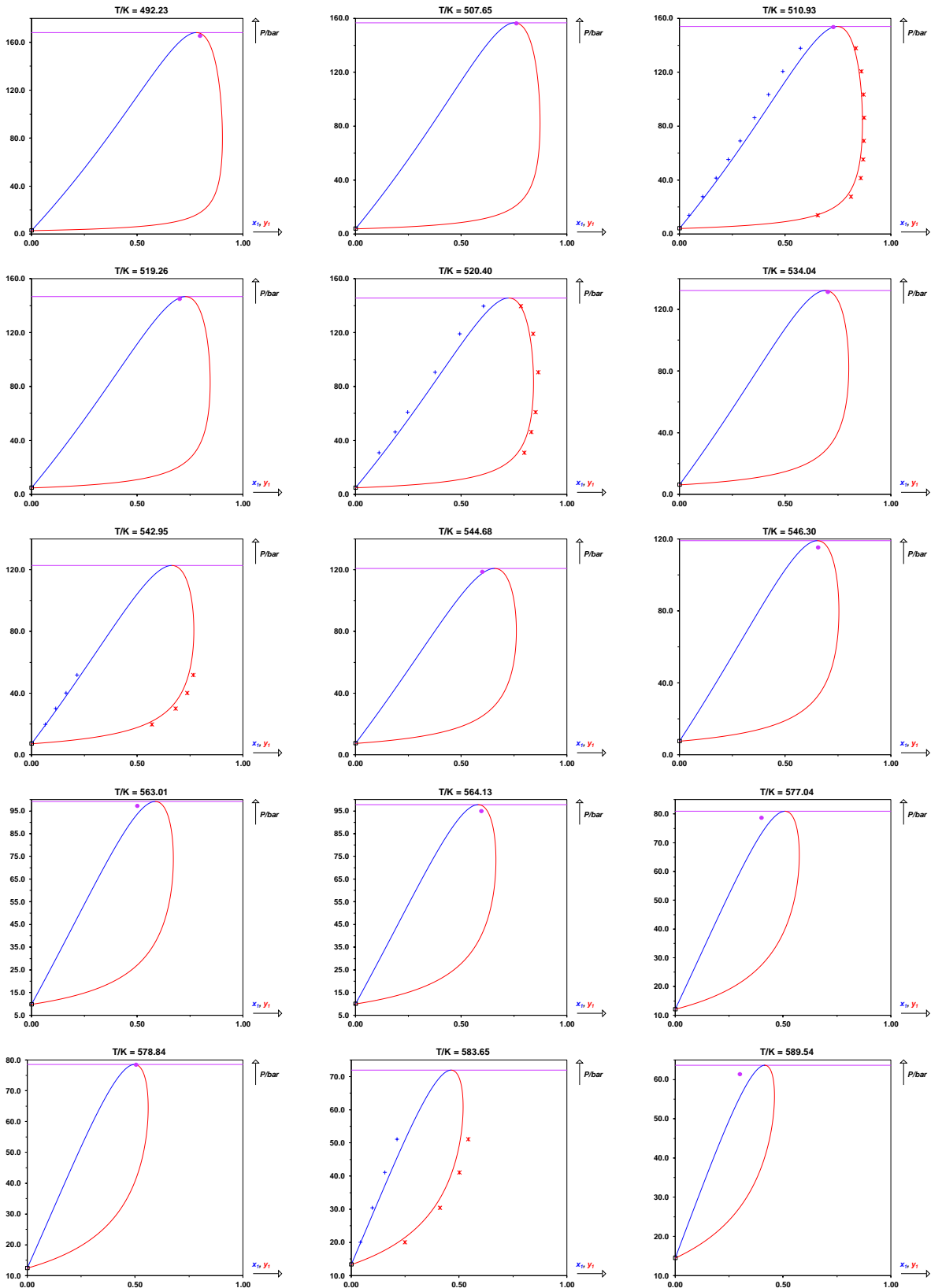
HA-NA systems (BAC = 2)



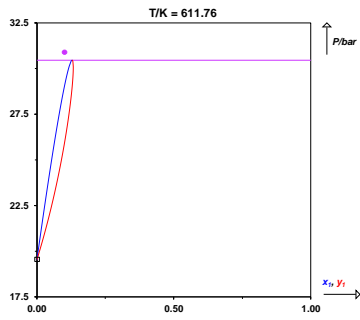
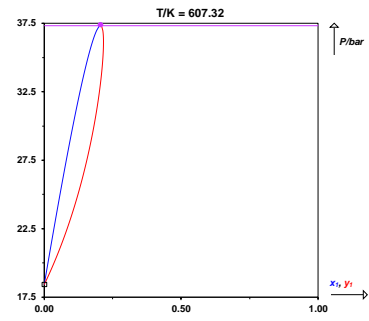
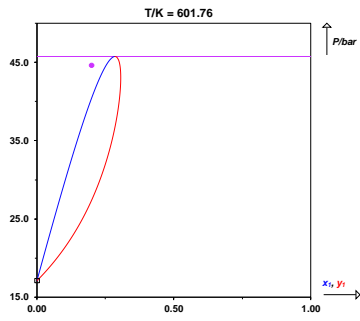
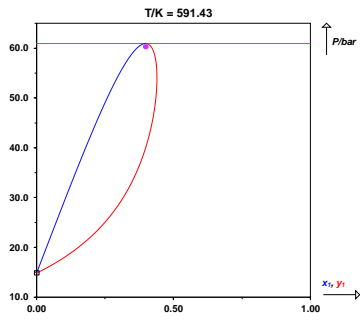
HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



CARBON DIOXIDE (1) + n-DOTRIACONTANE (2)

CAS	124-38-9	544-85-4
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	QHMGJGNTMQDRQA-UHFFFAOYSA-N
T_c / K	304.21	855.00
P_c / bar	73.83	7.50
ω	0.224	1.377

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

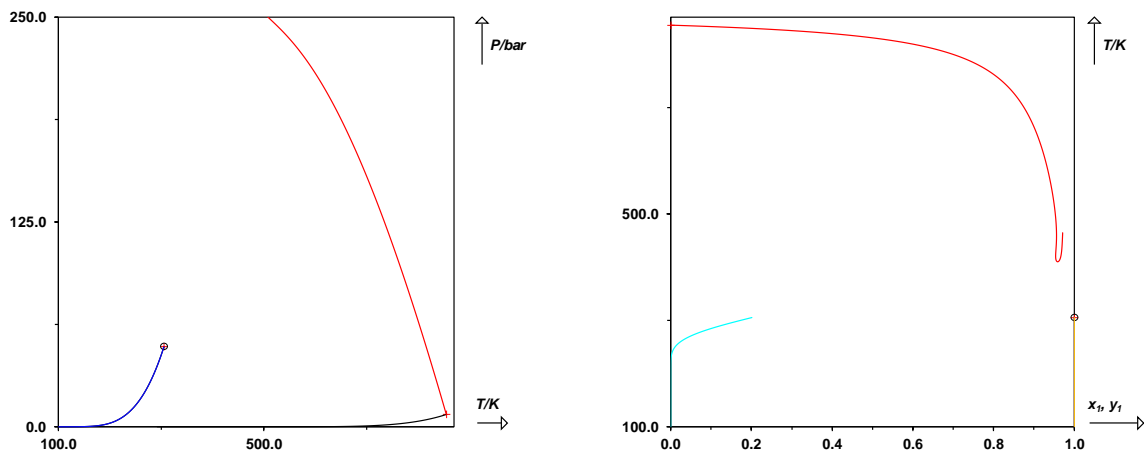
$A/\text{MPa} = 201.0$

$B/\text{MPa} = 997.7$

Deviations

MAPE on $x = 4.4\%$

MAPE on $y = 34\%$



Isothermal phase equilibrium data

Fall, David J. - Luks, Kraemer D., Phase equilibria behavior of the systems carbon dioxide + n-dotriacontane and carbon dioxide + n-docosane, Journal of Chemical & Engineering Data. 29 (1984) 413-417.

doi:10.1021/je00038a013

T / K = 348.15

P / bar	x_1
9.520	0.1111
12.39	0.1501
20.92	0.2279
25.50	0.2793
34.05	0.3409
42.25	0.4037
48.35	0.4368
57.83	0.4941
63.44	0.5218
69.73	0.5503
72.08	0.5618

Fall, David J. - Luks, Kraemer D., Phase equilibria behavior of the systems carbon dioxide + n-dotriacontane and carbon dioxide + n-docosane, Journal of Chemical & Engineering Data. 29 (1984) 413-417.

doi:10.1021/je00038a013

T / K = 373.15

P / bar	x_1
11.57	0.1223
27.08	0.2575
35.68	0.3114
42.86	0.3606
43.88	0.3687
49.68	0.4006
57.79	0.4457
58.13	0.4455
64.30	0.4724
70.34	0.5056
72.23	0.5087

Tsai, Fuan Nan - Yau, Jun Shun, Solubility of carbon dioxide in n-tetracosane and in n-dotriacontane, Journal of Chemical & Engineering Data. 35 (1990) 43-45.

doi:10.1021/je00059a014

T / K = 373.15

P / bar	x_1
10.13	0.1008
20.27	0.1971
30.40	0.2701
40.53	0.3371
50.66	0.3962

Spee, M. - Schneider, G.M., Fluid phase equilibrium studies on binary and ternary mixtures of carbon dioxide with hexadecane, 1-dodecanol, 1,8-octanediol and dotriacontane at 393.2 K and at pressures up to 100 MPa, Fluid Phase Equilibria. 65 (1991) 263-274.

doi:10.1016/0378-3812(91)87029-9

T / K = 393.20

P / bar	x_1	y_1
100.00	0.6773	0.9997
200.00	0.7639	0.9996
200.00	0.7668	0.9997
250.00	0.7844	0.9992
300.00	0.8079	0.9982
400.00	0.8671	0.9972
500.00	0.9081	0.9934
600.00	0.9272	0.9849
630.00	0.9426	0.9800
630.00	0.9456	0.9804

Fall, David J. - Luks, Kraemer D., Phase equilibria behavior of the systems carbon dioxide + n-dotriacontane and carbon dioxide + n-docosane, Journal of Chemical & Engineering Data. 29 (1984) 413-417.

doi:10.1021/je00038a013

T / K = 398.15

P / bar	x_1
9.460	0.0963
12.04	0.1168
14.76	0.1431
21.19	0.1990
26.86	0.2379
29.36	0.2553
34.51	0.2944
43.82	0.3438
44.31	0.3483
48.93	0.3760
53.89	0.3980
58.98	0.4186
64.42	0.4518
71.64	0.4821
72.29	0.4772

Tsai, Fuan Nan - Yau, Jun Shun, Solubility of carbon dioxide in n-tetracosane and in n-dotriacontane, Journal of Chemical & Engineering Data. 35 (1990) 43-45.

doi:10.1021/je00059a014

T / K = 473.15

P / bar	x_1
10.13	0.0714
20.27	0.1465
30.40	0.2010

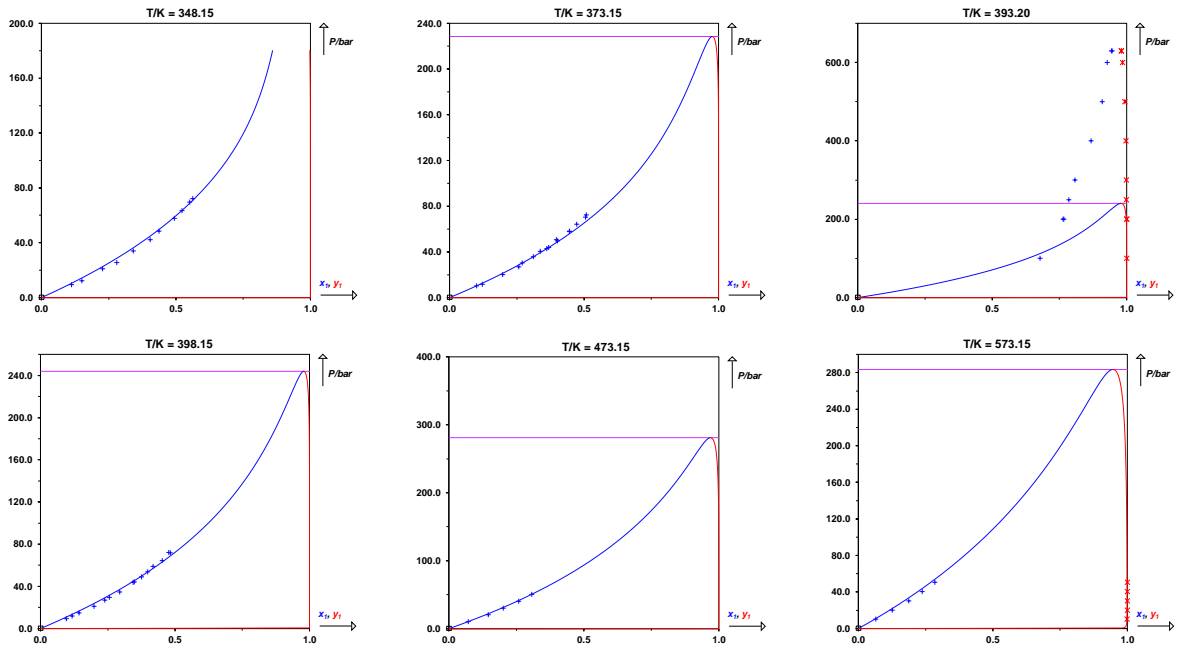
40.53	0.2582
50.66	0.3074

Tsai, Fuan Nan - Yau, Jun Shun, Solubility of carbon dioxide in n-tetracosane and in n-dotriacontane, Journal of Chemical & Engineering Data. 35 (1990) 43-45.
doi:10.1021/je00059a014

T / K = 573.15

P / bar	x_1	y_1
10.13	0.0649	0.9989
20.27	0.1260	0.9994
30.40	0.1868	0.9995
40.53	0.2367	0.9995
50.66	0.2839	0.9996

HA-NA systems (BAC = 2)



n-PENTANE (1) + ACETONE (2)

CAS	109-66-0	67-64-1
InChiKey	OFBQJSOFQDEBGM-UHFFFAOYSA-N	CSCPPACGZOO CGX-UHFFFAOYSA-N
T_c / K	469.70	508.20
P_c / bar	33.70	47.01
ω	0.252	0.307

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 88.96

B/MPa = 104.3

Deviations

MAPE on x = 13 %

MAPE on y = 5.8 %

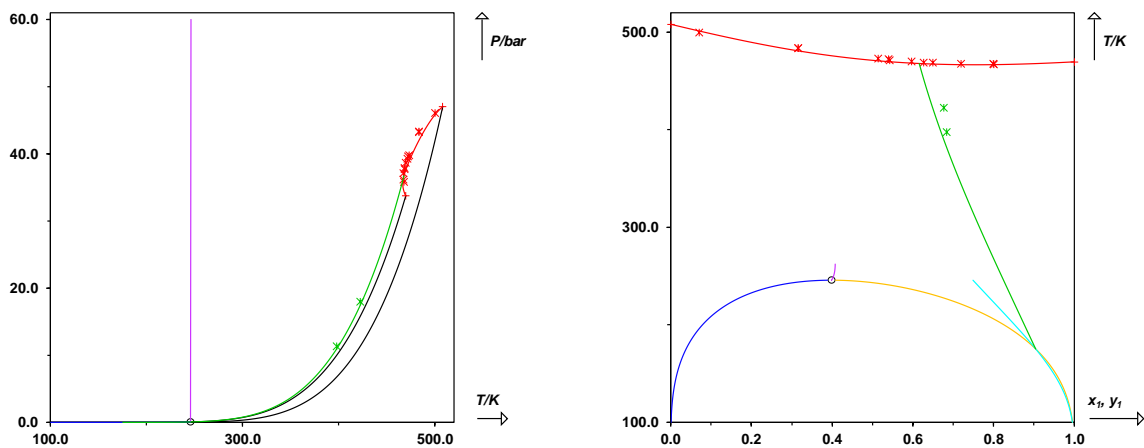
MAPE on x_c = 15 %

MAPE on P_c = 2.2 %

MAPE on x_{az} = 4.8 %

MAPE on P_{az} = 3.3 %

MAPE on h^M = 14 %



-----			6.609	0.5320	0.6160	
Isothermal phase equilibrium data			6.722	0.6490	0.6710	
-----			6.681	0.7850	0.7530	
Rall, W. - Schäfer, K., Thermodynamische Untersuchungen an flüssigen Mischsystemen von Aceton und n-Pentan sowie von Aceton und n-Hexan, Z. Elektrochem. 63 (1959) 1019-1024.			6.378	0.9160	0.8690	
T / K = 258.15			Campbell, Scott W. - Wilsak, Richard A. - Thodos, George, Isothermal vapor-liquid equilibrium measurements for the n-pentane-acetone system at 372.7, 397.7, and 422.6 K, Journal of Chemical & Engineering Data. 31 (1986) 424-430. doi:10.1021/je00046a016			
P / bar	x ₁	y ₁	T / K = 397.70			
0.0779	0.0497	0.5079	P / bar	x ₁	y ₁	
0.1072	0.1269	0.6617	7.601	0.0440	0.1350	
0.1171	0.1639	0.6890	8.208	0.0870	0.2080	
0.1291	0.2851	0.7319	8.863	0.1330	0.2940	
0.1332	0.3857	0.7442	9.680	0.2100	0.3920	
0.1351	0.4730	0.7490	10.47	0.3310	0.4780	
0.1353	0.5459	0.7550	10.84	0.4120	0.5330	
0.1365	0.6580	0.7650	11.10	0.4950	0.5690	
0.1371	0.7173	0.7689	11.28	0.5760	0.6210	
0.1372	0.8325	0.7933	11.36	0.6840	0.6840	AZEO
0.1329	0.9287	0.8490	11.35	0.7020	0.7010	
Rall, W. - Schäfer, K., Thermodynamische Untersuchungen an flüssigen Mischsystemen von Aceton und n-Pentan sowie von Aceton und n-Hexan, Z. Elektrochem. 63 (1959) 1019-1024.			11.15	0.8240	0.7900	
T / K = 298.15			10.68	0.9190	0.8820	
P / bar	x ₁	y ₁	Campbell, Scott W. - Wilsak, Richard A. - Thodos, George, Isothermal vapor-liquid equilibrium measurements for the n-pentane-acetone system at 372.7, 397.7, and 422.6 K, Journal of Chemical & Engineering Data. 31 (1986) 424-430. doi:10.1021/je00046a016			
0.3408	0.0094	0.1055	T / K = 422.60			
0.4581	0.0540	0.3633	P / bar	x ₁	y ₁	
0.5285	0.0887	0.4592	13.62	0.1140	0.2080	
0.6245	0.1600	0.5648	14.81	0.1800	0.2980	
0.7330	0.3741	0.6654	15.87	0.2570	0.3810	
0.7305	0.3880	0.6658	17.39	0.4450	0.5370	
0.7561	0.4721	0.6865	17.99	0.6580	0.6630	
0.7666	0.5689	0.7074	17.99	0.6760	0.6760	AZEO
0.7763	0.6548	0.7274	17.82	0.7940	0.7700	
0.7767	0.7192	0.7442	17.22	0.8790	0.8470	
0.7782	0.7787	0.7623	16.36	0.9560	0.9310	
0.7529	0.9223	0.8486	-----			
Campbell, Scott W. - Wilsak, Richard A. - Thodos, George, Isothermal vapor-liquid equilibrium measurements for the n-pentane-acetone system at 372.7, 397.7, and 422.6 K, Journal of Chemical & Engineering Data. 31 (1986) 424-430. doi:10.1021/je00046a016			Enthalpy of mixing			
T / K = 372.70			-----			
P / bar	x ₁	y ₁	Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.			
4.781	0.0840	0.2650	T / K = 243.20			
5.516	0.1800	0.3740	P / bar = UNKNOWN (1.0132)			
6.133	0.3150	0.5100	h ^M / J.mol ⁻¹ x ₁			
6.422	0.4220	0.5460				

HA-NA systems (BAC = 2)

284.00	0.0507	1345.0	0.6301
583.00	0.1153	1239.0	0.7056
814.00	0.1822	1068.0	0.7920
1030.0	0.2677	802.00	0.8743
1148.0	0.3481	519.00	0.9290
1207.0	0.4312	292.00	0.9664
1223.0	0.4710		
1229.0	0.4868		
1236.0	0.5635		
1174.0	0.6552		
1120.0	0.7009		
968.00	0.7892		
789.00	0.8634		
611.00	0.9047		
396.00	0.9462		

Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.

T / K = 253.20

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

463.00	0.0859
791.00	0.1716
1029.0	0.2544
1170.0	0.3324
1256.0	0.4298
1276.0	0.5061
1280.0	0.5727
1268.0	0.6168
1179.0	0.6868
1084.0	0.7513
946.00	0.8129
714.00	0.8854
402.00	0.9474

Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.

T / K = 273.20

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

335.00	0.0584
623.00	0.1181
922.00	0.2006
1096.0	0.2643
1251.0	0.3332
1327.0	0.4073
1367.0	0.4672
1374.0	0.5456

Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.

T / K = 293.20

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

314.00	0.0534
745.00	0.1452
1037.0	0.2256
1254.0	0.3026
1387.0	0.3805
1426.0	0.4292
1440.0	0.4883
1450.0	0.5704
1386.0	0.6553
1282.0	0.7261
1133.0	0.7882
892.00	0.8567
540.00	0.9290

Critical point

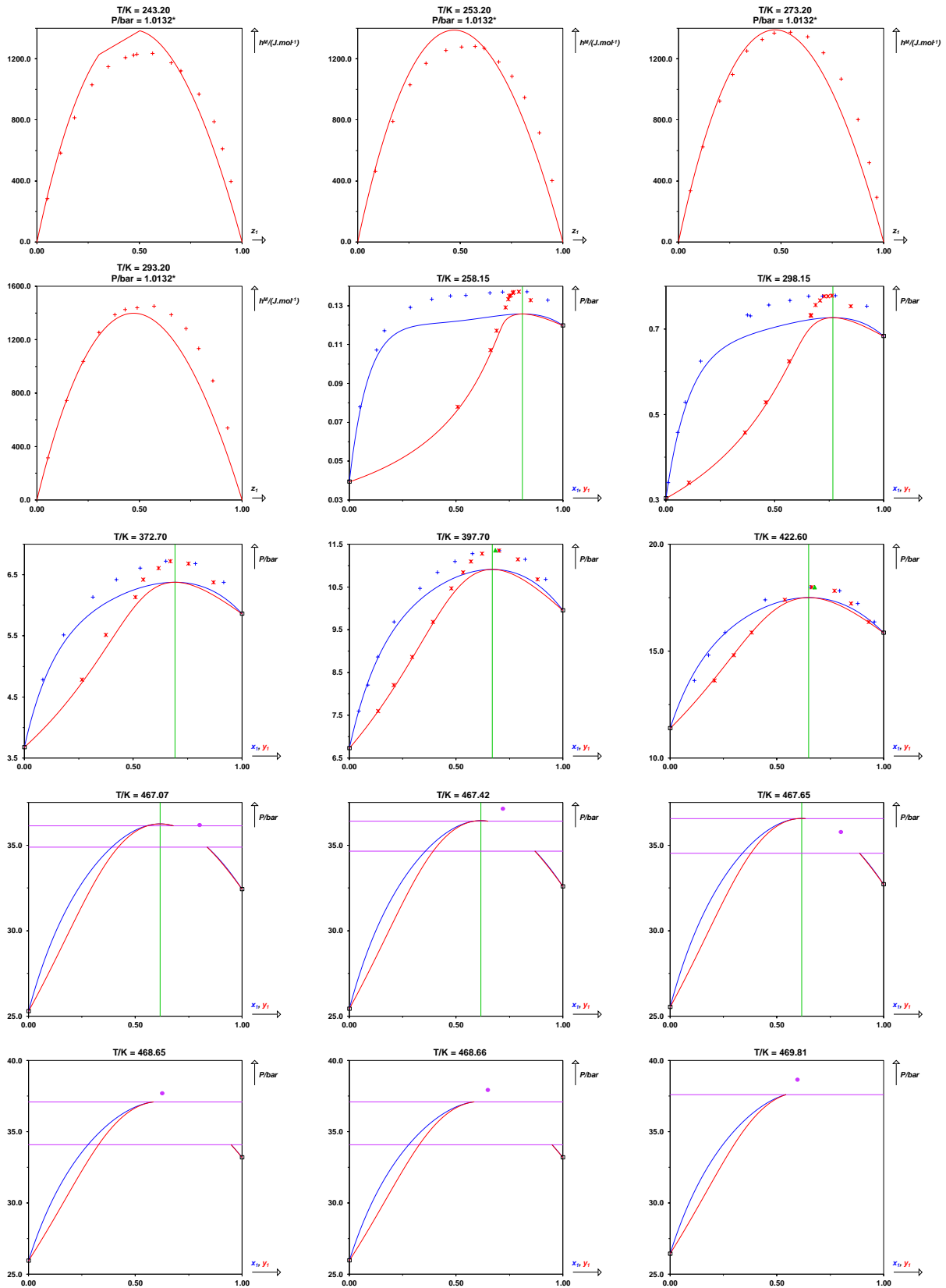
Hajjar, Raja F. - Cherry, R.H. - Kay, W.B., Critical properties of the vapor—liquid equilibria of the binary system acetone—n-pentane, Fluid Phase Equilibria. 25 (1986) 137-146. doi:10.1016/0378-3812(86)80011-5

T / K	P / bar	x_1
467.07	36.17	0.8003
467.42	37.13	0.7188
468.66	37.91	0.6490
469.81	38.64	0.5967
471.31	39.23	0.5430
472.99	39.73	0.5141
483.65	43.20	0.3154
499.95	46.10	0.0708

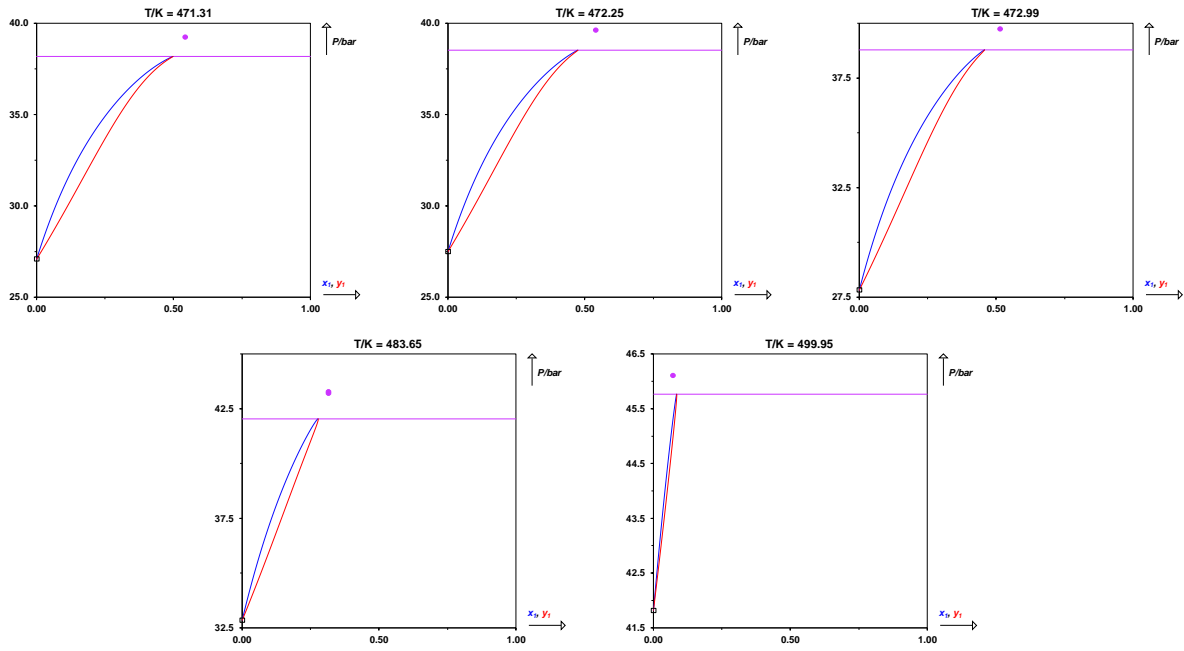
Kay, Webster B., P-T-x Diagrams in the Critical Region. Acetone-n-Alkane Systems, The Journal of Physical Chemistry. 68 (1964) 827-831. doi:10.1021/j100786a021

T / K	P / bar	x_1
467.65	35.77	0.7990
468.65	37.69	0.6260
472.25	39.62	0.5390
483.65	43.27	0.3150

HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



ACETONE (1) + BENZENE (2)

CAS	67-64-1	71-43-2
InChiKey	CSCPPACGZOO CGX-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	508.20	562.05
P_c / bar	47.01	48.95
ω	0.307	0.210

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 23.54$

$B/\text{MPa} = 23.11$

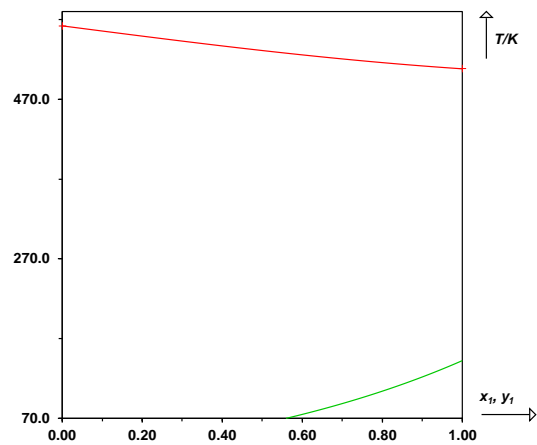
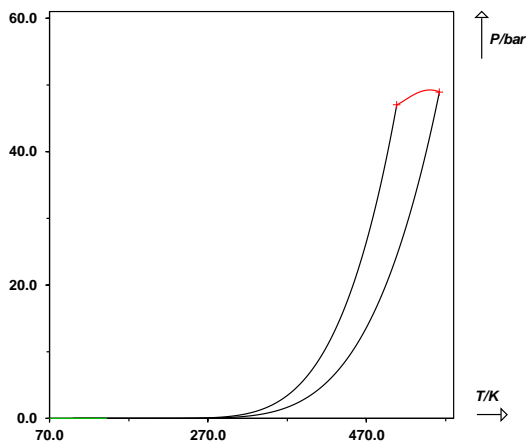
Deviations

MAPE on $x = 8.0\%$

MAPE on $y = 7.2\%$

MAPE on $h^M = 61\%$

MAPE on $c_p^M = 174\%$



-----			0.2200	0.0500	0.1410
Isothermal phase equilibrium data			0.2403	0.1000	0.2540
-----			0.2595	0.1500	0.3460
Tasić, Aleksandar - Djordjević, Bojan - Grozdanić, Dušan -			0.2777	0.2000	0.4220
Afgan, Naim - Malić, Dragomir, Vapour—liquid equilibria			0.2949	0.2500	0.4870
of the systems acetone—benzene, benzene—			0.3114	0.3000	0.5430
cyclohexane and acetone—cyclohexane at 25°C, Chemical			0.3270	0.3500	0.5930
Engineering Science. 33 (1978) 189-197.			0.3418	0.4000	0.6360
doi:10.1016/0009-2509(78)85053-2			0.3558	0.4500	0.6760
T / K =	298.15		0.3692	0.5000	0.7110
P / bar	x ₁	y ₁	0.3817	0.5500	0.7440
0.1555	0.0820	0.2480	0.3936	0.6000	0.7740
0.1829	0.1850	0.4160	0.4048	0.6500	0.8030
0.2084	0.3070	0.5500	0.4152	0.7000	0.8300
0.2257	0.4010	0.6320	0.4250	0.7500	0.8560
0.2428	0.5050	0.7030	0.4341	0.8000	0.8820
0.2549	0.5900	0.7550	0.4425	0.8500	0.9080
0.2709	0.7040	0.8240	0.4501	0.9000	0.9350
0.2845	0.8055	0.8820	0.4570	0.9500	0.9650
0.2946	0.8955	0.9360			
Drobig, J. - Lindenau, E., A new apparatus to determine			Kraus, J. - Linek, J., Liquid-vapor equilibrium. XLVIII.		
the isothermal liquid-vapor equilibrium, Wiss. Z. Tech.			Systems acetone-benzene, acetone-toluene, benzene-		
Hochsch. Chem. Leuna-Merseburg. 8 (1966) 144-147.			methyl ethyl ketone, methyl ethyl ketone-toluene, and		
T / K =	298.15		methyl ethyl ketone-ethylbenzene, Collection of		
P / bar	x ₁	y ₁	Czechoslovak Chemical Communications. 36 (1971) 2547-		
0.1419	0.0500	0.1460	2567. doi:10.1135/cccc19712547		
0.1555	0.1000	0.2600	T / K =	313.15	
0.1684	0.1500	0.3530	P / bar	x ₁	y ₁
0.1805	0.2000	0.4290	0.2814	0.0570	0.1758
0.1920	0.2500	0.4940	0.3063	0.1027	0.2769
0.2028	0.3000	0.5490	0.3742	0.2615	0.4921
0.2132	0.3500	0.5980	0.3959	0.3240	0.5535
0.2229	0.4000	0.6410	0.4124	0.3734	0.5946
0.2323	0.4500	0.6800	0.4384	0.4636	0.6631
0.2411	0.5000	0.7150	0.4597	0.5300	0.7085
0.2493	0.5500	0.7470	0.4756	0.5892	0.7481
0.2573	0.6000	0.7780	0.5087	0.7325	0.8355
0.2648	0.6500	0.8060	0.5244	0.8051	0.8782
0.2717	0.7000	0.8330	0.5418	0.8807	0.9238
0.2784	0.7500	0.8590	Drobig, J. - Lindenau, E., A new apparatus to determine		
0.2844	0.8000	0.8840	the isothermal liquid-vapor equilibrium, Wiss. Z. Tech.		
0.2900	0.8500	0.9090	Hochsch. Chem. Leuna-Merseburg. 8 (1966) 144-147.		
0.2952	0.9000	0.9360	T / K =	318.15	
0.2997	0.9500	0.9650	P / bar	x ₁	y ₁
Drobig, J. - Lindenau, E., A new apparatus to determine			0.3293	0.0500	0.1380
the isothermal liquid-vapor equilibrium, Wiss. Z. Tech.			0.3585	0.1000	0.2490
Hochsch. Chem. Leuna-Merseburg. 8 (1966) 144-147.			0.3864	0.1500	0.3400
T / K =	308.15		0.4129	0.2000	0.4160
P / bar	x ₁	y ₁	0.4381	0.2500	0.4820
			0.4621	0.3000	0.5380

HA-NA systems (BAC = 2)

0.4849	0.3500	0.5880	340.65	0.2750	0.4880
0.5066	0.4000	0.6320	337.05	0.4390	0.6320
0.5270	0.4500	0.6720	334.15	0.5920	0.7420
0.5465	0.5000	0.7080	332.75	0.6930	0.8060
0.5648	0.5500	0.7410	331.65	0.7860	0.8650
0.5820	0.6000	0.7710	330.65	0.8730	0.9160
0.5982	0.6500	0.8000	329.95	0.9420	0.9640
0.6133	0.7000	0.8270	329.55	0.9810	0.9880
0.6274	0.7500	0.8540			
0.6405	0.8000	0.8800			
0.6526	0.8500	0.9060			
0.6637	0.9000	0.9340			
0.6737	0.9500	0.9650			

Drobig, J. - Lindenau, E., A new apparatus to determine the isothermal liquid-vapor equilibrium, *Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg*. 8 (1966) 144-147.

T / K = 328.15

P / bar	x ₁	y ₁
0.4773	0.0500	0.1350
0.5184	0.1000	0.2450
0.5577	0.1500	0.3350
0.5952	0.2000	0.4120
0.6309	0.2500	0.4770
0.6649	0.3000	0.5340
0.6973	0.3500	0.5840
0.7279	0.4000	0.6280
0.7569	0.4500	0.6680
0.7843	0.5000	0.7040
0.8102	0.5500	0.7370
0.8345	0.6000	0.7680
0.8571	0.6500	0.7970
0.8785	0.7000	0.8250
0.8982	0.7500	0.8510
0.9165	0.8000	0.8780
0.9333	0.8500	0.9050
0.9487	0.9000	0.9330
0.9626	0.9500	0.9650

Isobaric phase equilibrium data

Müller, Eckart - Stage, H, Experimentelle Vermessung von Dampf-Flüssigkeits-Phasengleichgewichten dargestellt am Beispiel des Siedeverhaltens von Fettsäuren (1961)

P / bar = 1.013

T / K	x ₁	y ₁
350.95	0.0290	0.0910
347.55	0.0830	0.2230
343.65	0.1780	0.3740

Free, K. W. - Hutchinson, H. P., Isobaric Vapor-Liquid Equilibria for the Ternary System Acetone-Benzene-Chlorobenzene., *Journal of Chemical & Engineering Data*. 4 (1959) 193-197. doi:10.1021/je60003a001

P / bar = 1.013

T / K	x ₁	y ₁
349.65	0.0540	0.1550
348.05	0.0840	0.2180
344.95	0.1560	0.3380
342.25	0.2370	0.4400
341.95	0.2400	0.4440
339.55	0.3350	0.5410
337.35	0.4320	0.6230
335.55	0.5320	0.6980
333.75	0.6470	0.7740
332.75	0.7090	0.8130
332.25	0.7580	0.8450
330.85	0.8690	0.9150

Ishikawa, T. - Watari, R. - Kosakai, K. - Hirata, M., Vapor-liquid equilibriums of binary systems containing acetone at 760 mm of mercury. Acetone with aromatic hydrocarbons, *Mem. Fac. Technol. Tokyo Metropol. Univ.* 21 (1971) 1883-1896.

P / bar = 1.013

T / K	x ₁	y ₁
349.15	0.0560	0.1500
346.45	0.1060	0.2460
342.25	0.2080	0.3965
339.45	0.3180	0.5125
337.15	0.4285	0.6140
337.05	0.4360	0.6215
335.05	0.5575	0.7000
333.25	0.6730	0.7850
331.85	0.7860	0.8550
330.65	0.9030	0.9340
330.05	0.9560	0.9690

Monick, J. A. - Allen, H. D. - Marlies, C. J., Vapor-liquid equilibrium data for fatty acids and fatty methyl esters at low pressures, *Oil & Soap*. 23 (1946) 177-182. doi:10.1007/BF02545630

P / bar =	1.013	
T / K	x_1	y_1
352.35	0.0100	0.0352
349.50	0.0500	0.1496
346.75	0.1000	0.2531
342.85	0.2000	0.4030
339.90	0.3000	0.5147
337.65	0.4000	0.6030
335.80	0.5000	0.6785
334.15	0.6000	0.7464
332.75	0.7000	0.8100
331.50	0.8000	0.8737
330.40	0.9000	0.9371
329.85	0.9500	0.9687
329.42	0.9900	0.9937

Kojima, Kazuo - Tochigi, Katsumi - Kurihara, Kiyofumi - Nakamichi, Mikiyoshi, Isobaric vapor-liquid equilibria for acetone + chloroform + benzene and the three constituent binary systems, *Journal of Chemical & Engineering Data*. 36 (1991) 343-345. doi:10.1021/je00003a024

P / bar =	1.013	
T / K	x_1	y_1
345.38	0.1390	0.3210
343.36	0.1930	0.3990
341.03	0.2700	0.4880
338.14	0.3870	0.6010
337.31	0.4280	0.6300
336.94	0.4460	0.6470
336.54	0.4660	0.6610
335.97	0.4980	0.6830
335.06	0.5500	0.7210
334.20	0.6020	0.7530
333.86	0.6270	0.7690
333.16	0.6730	0.7980
332.39	0.7300	0.8330
332.36	0.7330	0.8340
330.90	0.8490	0.9050
330.63	0.8720	0.9190
330.49	0.8830	0.9260

Enthalpy of mixing

Akamatsu, Yutaka - Ogawa, Hideo - Murakami, Sachio, Molar excess enthalpies, molar excess volumes and molar isentropic compressions of mixtures of 2-propanone with heptane, benzene and trichloromethane at 298.15 K, *Thermochimica Acta*. 113 (1987) 141-150. doi:10.1016/0040-6031(87)88317-X

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
$h^M / J.mol^{-1}$	x_1	
39.70	0.0500	
67.90	0.1000	
89.00	0.1500	
105.10	0.2000	
117.60	0.2500	
126.70	0.3000	
133.20	0.3500	
135.90	0.4000	
138.20	0.4500	
138.40	0.5000	
136.80	0.5500	
132.70	0.6000	
126.50	0.6500	
118.00	0.7000	
106.70	0.7500	
92.70	0.8000	
76.10	0.8500	
55.00	0.9000	
27.00	0.9500	

Möbius, Hans-Heinrich, Mischungsenthalpien und Mischbarkeit von Aceton, Benzol und Wasser, *Journal für Praktische Chemie*. 2 (1955) 95-104. doi:10.1002/prac.19550020108

T / K =	303.15	
P / bar =	UNKNOWN (1.0132)	
$h^M / J.mol^{-1}$	x_1	
53.55	0.0666	
83.15	0.1215	
128.41	0.2811	
146.25	0.4967	
112.33	0.7430	
40.37	0.9285	

Heat capacity of mixing

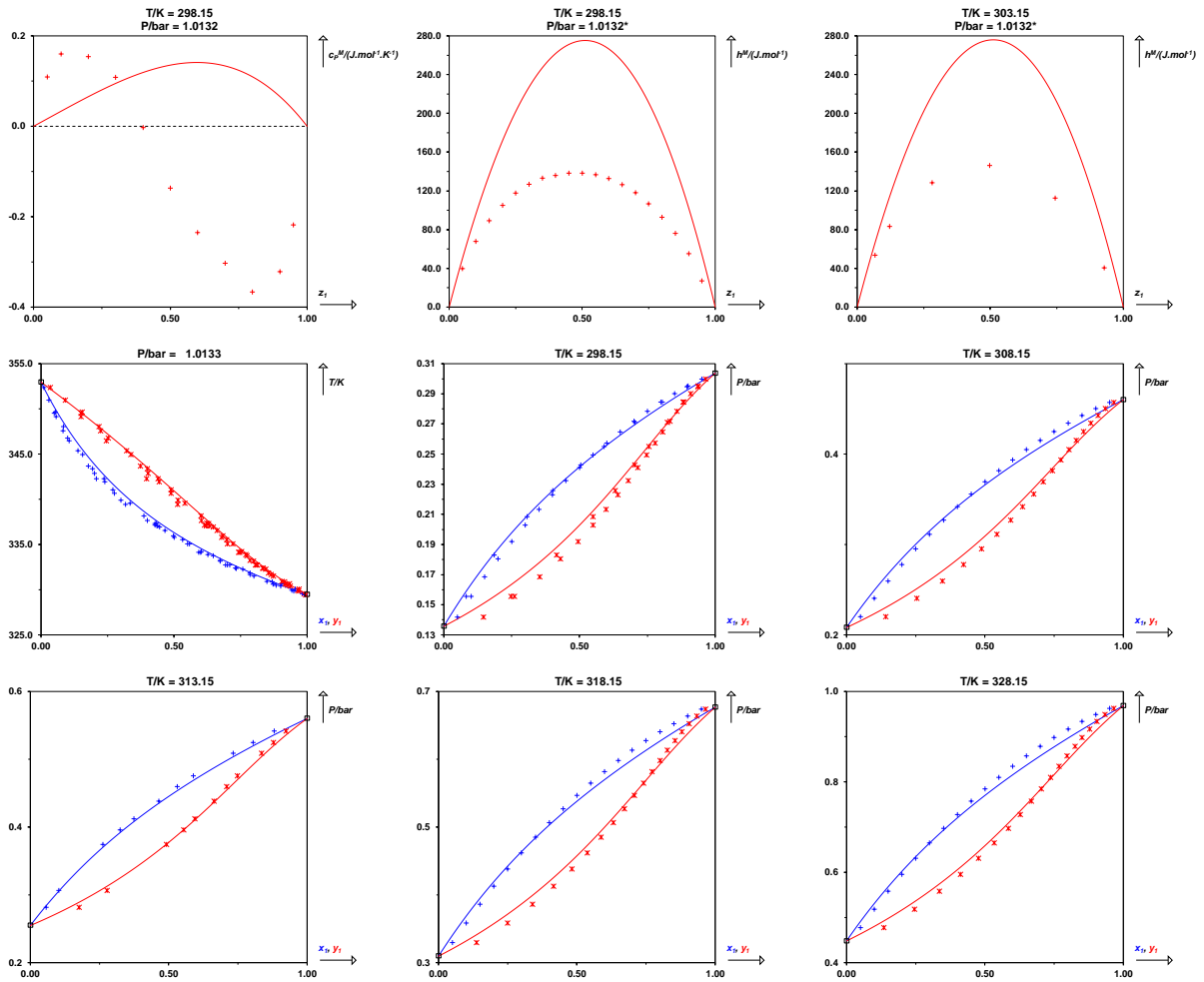
Yamanaka, Katsuhiko - Ogawa, Hideo - Murakami, Sachio, Excess molar isobaric heat capacities of mixtures of 2-propanone with heptane, benzene, and trichloromethane at 298.15 K, *Thermochimica Acta*. 169 (1990) 193-201. doi:10.1016/0040-6031(90)80145-O

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
$c_p^M / J.mol^{-1}.K^{-1}$	x_1	
0.1090	0.0500	
0.1600	0.1000	
0.1540	0.2000	

HA-NA systems (BAC = 2)

0.1080	0.3000
-0.0030	0.4000
-0.1370	0.5000
-0.2350	0.6000
-0.3030	0.7000
-0.3670	0.8000
-0.3220	0.9000
-0.2180	0.9500

HA-NA systems (BAC = 2)



ACETONE (1) + CYCLOHEXANE (2)

CAS	67-64-1	110-82-7
InChiKey	CSCPPACGZOO CGX-UHFFFAOYSA-N	XDTMQSROBMDMFD-UHFFFAOYSA-N
T_c / K	508.20	553.80
P_c / bar	47.01	40.80
ω	0.307	0.208

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 100.3$

$B/\text{MPa} = 120.7$

Deviations

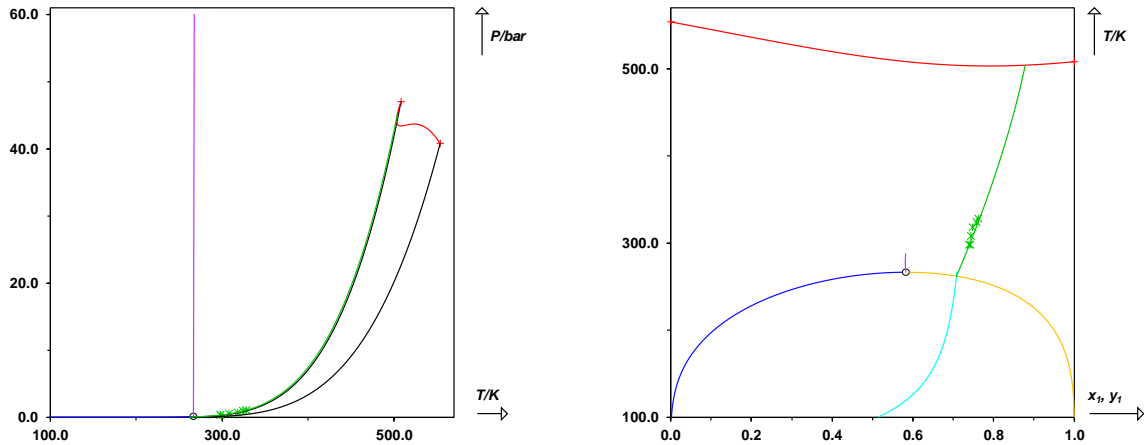
MAPE on $x = 10\%$

MAPE on $y = 3.2\%$

MAPE on $x_{az} = 1.3\%$

MAPE on $P_{az} = 0.53\%$

MAPE on $h^M = 16\%$



Isothermal phase equilibrium data							
-----				0.3494	0.7420	0.7420	AZEO
Isothermal phase equilibrium data				0.3483	0.7990	0.7681	
-----				0.3453	0.8610	0.7976	
Tasić, Aleksandar - Djordjević, Bojan - Grozdanić, Dušan -				0.3380	0.9209	0.8536	
Afgan, Naim - Malić, Dragomir, Vapour—liquid equilibria				Marinichev, A.N. - Susarev, M.P., Liquid-vapor			
of the systems acetone—benzene, benzene—				equilibriums in the systems acetone-methanol and			
cyclohexane and acetone—cyclohexane at 25°C, Chemical				acetone-cyclohexane at 35, 45, and 55° and a pressure of			
Engineering Science. 33 (1978) 189-197.				760 mm, J. Appl. Chem. USSR. 38 (1965) 371-375.			
doi:10.1016/0009-2509(78)85053-2				T / K = 308.15			
T / K =	298.15			P / bar	x ₁	y ₁	
P / bar	x ₁	y ₁		0.4548	0.1980	0.6010	
0.1574	0.0115	0.1810		0.4797	0.2830	0.6350	
0.1666	0.0160	0.2250		0.4949	0.3870	0.6650	
0.1839	0.0250	0.3040		0.5032	0.4890	0.6860	
0.1933	0.0300	0.3450		0.5097	0.5980	0.7090	
0.2137	0.0440	0.4100		0.5130	0.7000	0.7320	
0.2305	0.0575	0.4580		0.5146	0.7430	0.7430	AZEO
0.2609	0.0890	0.5330		0.5141	0.7710	0.7540	
0.2769	0.1125	0.5670		0.5020	0.8950	0.8410	
0.3036	0.1775	0.6110		Marinichev, A.N. - Susarev, M.P., Liquid-vapor			
0.3171	0.2330	0.6325		equilibriums in the systems acetone-methanol and			
0.3284	0.3090	0.6550		acetone-cyclohexane at 35, 45, and 55° and a pressure of			
0.3385	0.4235	0.6800		760 mm, J. Appl. Chem. USSR. 38 (1965) 371-375.			
0.3432	0.5105	0.6940		T / K = 318.15			
0.3458	0.5760	0.7050		P / bar	x ₁	y ₁	
0.3473	0.6250	0.7095		0.6509	0.1970	0.5870	
0.3481	0.6605	0.7170		0.6917	0.2810	0.6290	
0.3486	0.6920	0.7250		0.7161	0.3840	0.6580	
0.3493	0.7390	0.7390	AZEO	0.7290	0.4910	0.6800	
0.3492	0.7575	0.7460		0.7415	0.5980	0.7040	
0.3449	0.8605	0.8030		0.7509	0.7000	0.7340	
0.3409	0.8930	0.8280		0.7513	0.7470	0.7470	AZEO
0.3360	0.9250	0.8580		0.7478	0.7710	0.7590	
0.3250	0.9625	0.9160		0.7318	0.8950	0.8510	
Puri, Pushpinder S. - Polak, Jiri - Ruether, John A., Vapor-				Crespo Colin, A. - Compostizo, A. - Díaz Peña, M., Excess			
liquid equilibriums of acetone-cyclohexane and acetone-				Gibbs energy and excess volume of (cyclohexane + 2-			
isopropanol systems at 25°C, Journal of Chemical &				propanone) and of (cyclohexane+2-butanone), The			
Engineering Data. 19 (1974) 87-89.				Journal of Chemical Thermodynamics. 16 (1984) 497-502.			
doi:10.1021/je60060a007				doi:10.1016/0021-9614(84)90208-8			
T / K =	298.15			T / K = 323.15			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
0.3092	0.2077	0.6184		0.5275	0.0501	0.3381	
0.3238	0.2868	0.6452		0.7167	0.1546	0.5450	
0.3322	0.3520	0.6609		0.7681	0.2087	0.5869	
0.3374	0.4158	0.6737		0.7925	0.2434	0.6055	
0.3418	0.4847	0.6867		0.8067	0.2695	0.6166	
0.3455	0.5654	0.7025		0.8357	0.3350	0.6404	
0.3477	0.6311	0.7156		0.8464	0.3666	0.6504	
0.3487	0.6809	0.7272					
0.3494	0.7316	0.7403					

HA-NA systems (BAC = 2)

0.8678	0.4491	0.6711	329.52	0.1910	0.5800	
0.8747	0.4812	0.6790	328.01	0.2460	0.6140	
0.8800	0.5122	0.6854	327.05	0.2960	0.6340	
0.8825	0.5226	0.6897	326.40	0.3450	0.6500	
0.8856	0.5470	0.6952	325.85	0.3990	0.6640	
0.8922	0.5922	0.7054	325.39	0.4530	0.6780	
0.8957	0.6197	0.7111	325.05	0.5010	0.6880	
0.8981	0.6418	0.7212	324.80	0.5520	0.6990	
0.9007	0.6770	0.7276	324.57	0.6090	0.7120	
0.9022	0.6916	0.7356	324.38	0.6590	0.7250	
0.9041	0.7161	0.7435	324.25	0.7570	0.7570	AZEO
0.9050	0.7463	0.7556	324.33	0.8230	0.7900	
0.9045	0.7751	0.7675	324.65	0.8790	0.8300	
0.9043	0.7931	0.7765	325.36	0.9350	0.8870	
0.9011	0.8309	0.7981	326.11	0.9690	0.9380	
0.8952	0.8677	0.8220				
0.8863	0.8985	0.8496				
0.8647	0.9495	0.9036				

Marinichev, A.N. - Susarev, M.P., Liquid-vapor equilibria in the systems acetone-methanol and acetone-cyclohexane at 35, 45, and 55° and a pressure of 760 mm, J. Appl. Chem. USSR. 38 (1965) 371-375.

T / K = 328.15

P / bar	x ₁	y ₁	
0.7474	0.0900	0.4320	
0.9110	0.1950	0.5760	
0.9721	0.2780	0.6230	
1.004	0.3800	0.6500	
1.036	0.4930	0.6770	
1.052	0.5980	0.7030	
1.067	0.7000	0.7380	
1.070	0.7620	0.7620	AZEO
1.070	0.7700	0.7660	
1.046	0.8950	0.8650	

Isobaric phase equilibrium data

Mejía, Andrés - Segura, Hugo - Cartes, Marcela - Calvo, Catherine, Vapor-liquid equilibria and interfacial tensions for the ternary system acetone+2,2'-oxybis[propane]+cyclohexane and its constituent binary systems, Fluid Phase Equilibria. 270 (2008) 75-86. doi:10.1016/j.fluid.2008.06.006

P / bar = 0.9400

T / K	x ₁	y ₁
345.05	0.0240	0.1990
339.48	0.0530	0.3490
334.38	0.0990	0.4740
331.43	0.1440	0.5390

Enthalpy of mixing

Pfeffer, Thomas - Löwen, Burkhard - Schulz, Siegfried, Calorimetric measurement of the partial molar excess enthalpy at infinite dilution iE_{∞} and its meaning for the calculation of the concentration and temperature dependence of the molar excess enthalpy hE , Fluid Phase Equilibria. 106 (1995) 139-167. doi:10.1016/0378-3812(94)02630-J

T / K = 283.15

P / bar = 4.000

$h^M / J.mol^{-1}$	z ₁
6.730	0.0007
13.40	0.0015
19.88	0.0022
26.21	0.0029
32.67	0.0036
38.98	0.0042

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochemica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 283.15

P / bar = 4.000

$h^M / J.mol^{-1}$	z ₁
376.40	0.0480
728.00	0.1050
966.20	0.1530
1145.8	0.1990
1293.0	0.2490
1416.2	0.2970
1494.4	0.3450

HA-NA systems (BAC = 2)

1536.9	0.3950	1364.6	0.6550
1553.2	0.4460	1259.6	0.7030
1546.4	0.4910	1125.6	0.7530
1525.4	0.5440	973.30	0.7990
1475.7	0.5920	766.80	0.8530
1383.0	0.6550	550.80	0.9010
1278.9	0.7030	307.10	0.9480
1148.8	0.7530		
995.10	0.7990		
784.00	0.8530		
566.70	0.9010		
318.30	0.9480		

Marongiu, B., Excess enthalpy. 2-Propanone-cyclohexane system, Int. DATA Ser., Sel. Data Mixtures, Ser. A. 1987 (1987) 1-6.

T / K = 298.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

477.00	0.0639
781.00	0.1153
1100.0	0.1832
1405.0	0.2873
1538.0	0.3775
1567.0	0.5072
1466.0	0.5987
1275.0	0.6939
1147.0	0.7388
828.00	0.8341
524.00	0.9025

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochemica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 298.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1

417.80	0.0480
759.10	0.1050
973.70	0.1530
1138.6	0.1990
1289.2	0.2490
1378.4	0.2970
1448.0	0.3450
1502.0	0.3950
1532.3	0.4460
1531.2	0.4910
1509.9	0.5440
1462.6	0.5920

Singh, Prem P. - Malik, Renu - Maken, S. - Acree, William E. - Zvaigzni, Anita I., Thermochemical investigations of associated solutions, Thermochemica Acta. 165 (1990) 113-127. doi:10.1016/0040-6031(90)80211-G

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

806.00	0.1086
1280.0	0.1965
1290.0	0.1997
1725.0	0.3339
1805.0	0.3882
1817.0	0.3979
1810.0	0.5654
1802.0	0.5704
1770.0	0.5887
1776.0	0.5891
1380.0	0.7419
1363.0	0.7461
1258.0	0.7751
755.00	0.8818
727.00	0.8862

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochemica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 323.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1

415.10	0.0480
782.10	0.1050
1022.8	0.1530
1201.3	0.1990
1345.7	0.2490
1460.6	0.2970
1550.4	0.3450
1603.9	0.3950
1627.5	0.4460
1633.9	0.4910
1597.9	0.5440
1538.8	0.5920

HA-NA systems (BAC = 2)

1422.8	0.6550	1608.7	0.3950
1306.1	0.7030	1640.7	0.4460
1157.8	0.7530	1648.5	0.4910
993.70	0.7990	1627.0	0.5440
775.90	0.8530	1575.3	0.5920
553.50	0.9010	1467.2	0.6550
305.90	0.9480	1349.3	0.7030

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochimica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 343.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1

379.80	0.0480
740.80	0.1050
976.50	0.1530
1162.7	0.1990
1312.0	0.2490
1432.4	0.2970
1518.1	0.3450
1573.3	0.3950
1601.2	0.4460
1608.4	0.4910
1582.6	0.5440
1531.7	0.5920
1426.6	0.6550
1312.5	0.7030
1169.1	0.7530
1005.3	0.7990
785.80	0.8530
560.10	0.9010
310.00	0.9480

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochimica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 363.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1

385.10	0.0480
743.50	0.1050
989.40	0.1530
1184.5	0.1990
1345.9	0.2490
1463.8	0.2970
1551.2	0.3450

1202.2	0.7530
1034.6	0.7990
808.80	0.8530
577.20	0.9010
319.20	0.9480

Gmehling, J. - Krentscher, B., Excess enthalpies of 12 binary liquid mixtures containing cyclohexane at elevated temperatures and pressures (up to 416 K and 1.9 MPa), ELDATA Int. Electron. J. Phys.-Chem. Data. 1 (1995) 181-190.

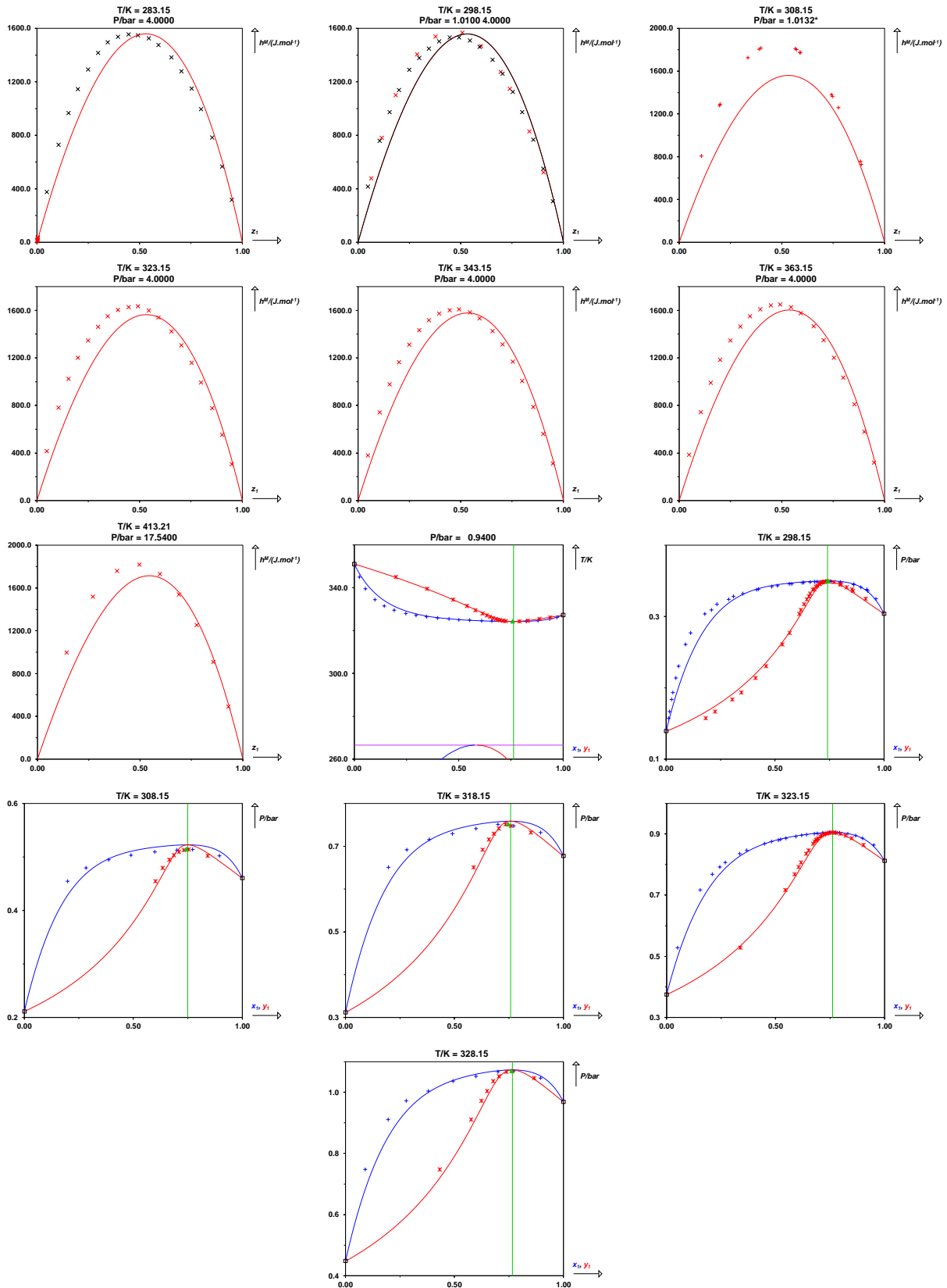
T / K = 413.21

P / bar = 17.54

$h^M / \text{J.mol}^{-1}$ z_1

997.16	0.1410
1517.9	0.2698
1759.2	0.3878
1818.1	0.4963
1729.5	0.5964
1539.2	0.6891
1254.4	0.7752
909.06	0.8553
490.00	0.9301

HA-NA systems (BAC = 2)



ACETONE (1) + n-HEXANE (2)

CAS	67-64-1	110-54-3
InChiKey	CSCPPACGZOO CGX-UHFFFAOYSA-N	VLKZOEYOYAKHREP-UHFFFAOYSA-N
T_c / K	508.20	507.60
P_c / bar	47.01	30.25
ω	0.307	0.301

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 97.06

B/MPa = 104.3

Deviations

MAPE on x = 16 %

MAPE on y = 7.0 %

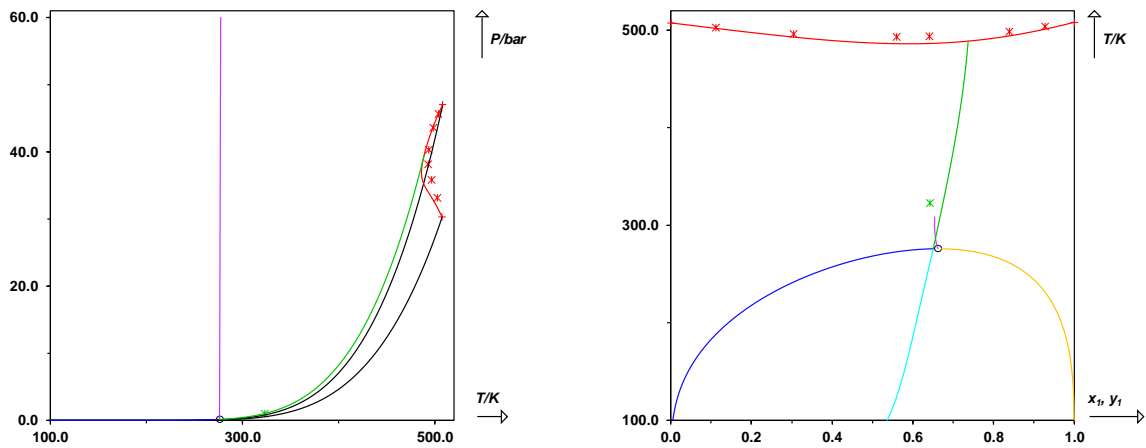
MAPE on x_c = 26 %

MAPE on P_c = 4.4 %

MAPE on x_{az} = 7.2 %

MAPE on P_{az} = 0.28 %

MAPE on h^M = 17 %



-----			0.6615	0.2369	0.5149
Isothermal phase equilibrium data			0.6654	0.2469	0.5200
-----			0.6674	0.2534	0.5231
Rall, W. - Schäfer, K., Thermodynamische Untersuchungen an flüssigen Mischsystemen von Aceton und n-Pentan sowie von Aceton und n-Hexan, Z. Elektrochem. 63 (1959) 1019-1024.			0.6810	0.2964	0.5418
T / K = 268.15			0.6838	0.3140	0.5485
P / bar	x ₁	y ₁	0.6931	0.3497	0.5609
0.0777	0.0839	0.4372	0.7057	0.4366	0.5864
0.0937	0.2618	0.5688	0.7122	0.4948	0.6013
0.0955	0.3402	0.5827	0.7153	0.5550	0.6160
0.0966	0.4172	0.5935	0.7172	0.6145	0.6309
0.0971	0.4569	0.5988	0.7172	0.6633	0.6441
0.0980	0.5230	0.6057	0.7070	0.7897	0.6921
0.0977	0.6039	0.6161	0.6809	0.8760	0.7543
0.0973	0.7250	0.6389	0.6524	0.9262	0.8175
0.0945	0.8535	0.6851	0.6395	0.9401	0.8412
0.0865	0.9337	0.7738	0.6147	0.9645	0.8925
0.0779	0.9768	0.8900	Kudryavtseva, L. S. - Susarev, M. P., Liquid-vapor equilibria in the systems acetone-hexane and hexane-ethyl alcohol at 35, 45, and 55 and 760mmHg, Zh. Prikl. Khim. 36 (1963) 1419-1424.		
Kudryavtseva, L. S. - Susarev, M. P., Liquid-vapor equilibria in the systems acetone-hexane and hexane-ethyl alcohol at 35, 45, and 55 and 760mmHg, Zh. Prikl. Khim. 36 (1963) 1419-1424.			T / K = 318.15		
T / K = 308.15			P / bar	x ₁	y ₁
P / bar	x ₁	y ₁	0.6405	0.0894	0.3300
0.4421	0.0862	0.3240	0.7649	0.1958	0.4890
0.5309	0.1902	0.4760	0.8153	0.2967	0.5400
0.5672	0.2945	0.5400	0.8413	0.3950	0.5840
0.5834	0.3917	0.5780	0.8579	0.4955	0.6080
0.5945	0.4945	0.6000	0.8617	0.5997	0.6220
0.5953	0.5996	0.6280	0.8633	0.6997	0.6540
0.5956	0.6995	0.6480	0.8482	0.8035	0.7000
0.5853	0.8049	0.7000	0.8055	0.9045	0.7870
0.5540	0.9060	0.7800	Kudryavtseva, L. S. - Susarev, M. P., Liquid-vapor equilibria in the systems acetone-hexane and hexane-ethyl alcohol at 35, 45, and 55 and 760mmHg, Zh. Prikl. Khim. 36 (1963) 1419-1424.		
Kolasińska, G. - Góral, M. - Giza, J., Vapour-Liquid Equilibria and Excess Gibbs Free Energy in Binary Systems of Acetone with Aliphatic and Aromatic Hydrocarbons at 313 15 K, Zeitschrift für Physikalische Chemie. 2630 (1982) doi:10.1515/zpch-1982-26317			T / K = 328.15		
T / K = 313.15			P / bar	x ₁	y ₁
P / bar	x ₁	y ₁	0.8930	0.0926	0.3300
0.4719	0.0385	0.2328	1.041	0.1846	0.4760
0.5017	0.0540	0.2869	1.136	0.2989	0.5400
0.5391	0.0782	0.3490	1.165	0.3933	0.5780
0.5891	0.1224	0.4222	1.191	0.4975	0.6020
0.6079	0.1417	0.4446	1.207	0.5998	0.6280
0.6397	0.1916	0.4874	1.200	0.6993	0.6610
0.6415	0.1950	0.4898	1.178	0.8021	0.7000
			1.122	0.9090	0.7950

-----			1236.0	0.6030
Isobaric phase equilibrium data			1112.0	0.7206
-----			980.00	0.7872
Acosta, Jhoany - Arce, Alberto - Martínez-Ageitos, José - Rodil, Eva - Soto, Ana, Vapor-Liquid Equilibrium of the Ternary System Ethyl Acetate + Hexane + Acetone at 101.32 kPa, Journal of Chemical & Engineering Data. 47 (2002) 849-854. doi:10.1021/je0102917			955.00	0.7936
P / bar = 1.013			883.00	0.8182
T / K	x ₁	y ₁	718.00	0.8670
340.07	0.0106	0.0575	534.00	0.9087
338.78	0.0132	0.0994	216.00	0.9679
336.35	0.0295	0.1811	Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.	
333.36	0.0631	0.2749	T / K = 253.20	
330.00	0.1032	0.3764	P / bar = UNKNOWN (1.0132)	
326.82	0.1796	0.4666	h ^M / J.mol ⁻¹	x ₁
325.08	0.2451	0.5173	587.00	0.0850
324.16	0.3050	0.5446	934.00	0.1712
323.43	0.3746	0.5773	1148.0	0.2565
322.88	0.4834	0.6042	1301.0	0.3584
322.78	0.5131	0.6102	1331.0	0.4225
322.69	0.5450	0.6172	1357.0	0.4599
322.70	0.6420	0.6420	1379.0	0.4902
322.69	0.6931	0.6570	1326.0	0.5526
322.82	0.7315	0.6706	1328.0	0.5604
322.93	0.7592	0.6829	1316.0	0.5900
323.16	0.7953	0.7012	1274.0	0.6365
323.83	0.8580	0.7428	1261.0	0.6607
324.60	0.8999	0.7840	1100.0	0.7480
325.73	0.9378	0.8386	1093.0	0.7535
327.02	0.9681	0.8999	815.00	0.8450
327.84	0.9826	0.9383	623.00	0.8921
328.67	0.9950	0.9763	559.00	0.9062
-----			223.00	0.9502
Enthalpy of mixing			Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.	
-----			T / K = 273.20	
Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.			P / bar = UNKNOWN (1.0132)	
T / K = 243.20			h ^M / J.mol ⁻¹	x ₁
P / bar = UNKNOWN (1.0132)			405.00	0.0509
h ^M / J.mol ⁻¹	x ₁		428.00	0.0531
334.00	0.0407		919.00	0.1517
618.00	0.0932		1070.0	0.1979
806.00	0.1395		1206.0	0.2540
1048.0	0.2324		1356.0	0.3181
1179.0	0.3314		1426.0	0.3819
1232.0	0.3803		1451.0	0.4466
1252.0	0.4318		1462.0	0.4587
1267.0	0.5278		1472.0	0.5243

1406.0	0.6057	1780.0	0.3781
1399.0	0.6121	1430.0	0.2323
1181.0	0.7341	1423.0	0.2287
1002.0	0.8079	943.00	0.1286
802.00	0.8490		
515.00	0.9163		
213.00	0.9680		

Critical point

Schaefer, K., Excess enthalpies of acetone + n-alkane (C3-C6) binary mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1978) 74-77.

T / K = 293.20

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

460.00	0.0580
813.00	0.1188
1067.0	0.1821
1276.0	0.2487
1425.0	0.3183
1534.0	0.3864
1572.0	0.4772
1549.0	0.5152
1513.0	0.5741
1491.0	0.5868
1459.0	0.6185
1374.0	0.6719
1359.0	0.6918
1218.0	0.7489
887.00	0.8402
482.00	0.9260

Kay, Webster B., P-T-x Diagrams in the Critical Region. Acetone-n-Alkane Systems, The Journal of Physical Chemistry. 68 (1964) 827-831. doi:10.1021/j100786a021

T / K	P / bar	x_1
493.05	38.10	0.5590
493.55	40.33	0.6410
496.35	35.77	0.3040
498.65	43.57	0.8390
502.55	33.13	0.1110
503.75	45.60	0.9280

Singh, Prem P. - Malik, Renu - Maken, S. - Acree, William E. - Tucker, Sheryl A., Thermochemical investigations of associated solutions. 10. Excess enthalpies and excess volumes of ternary acetone + bromoform + n-hexane mixtures, Thermochimica Acta. 162 (1990) 291-309. doi:10.1016/0040-6031(90)80350-8

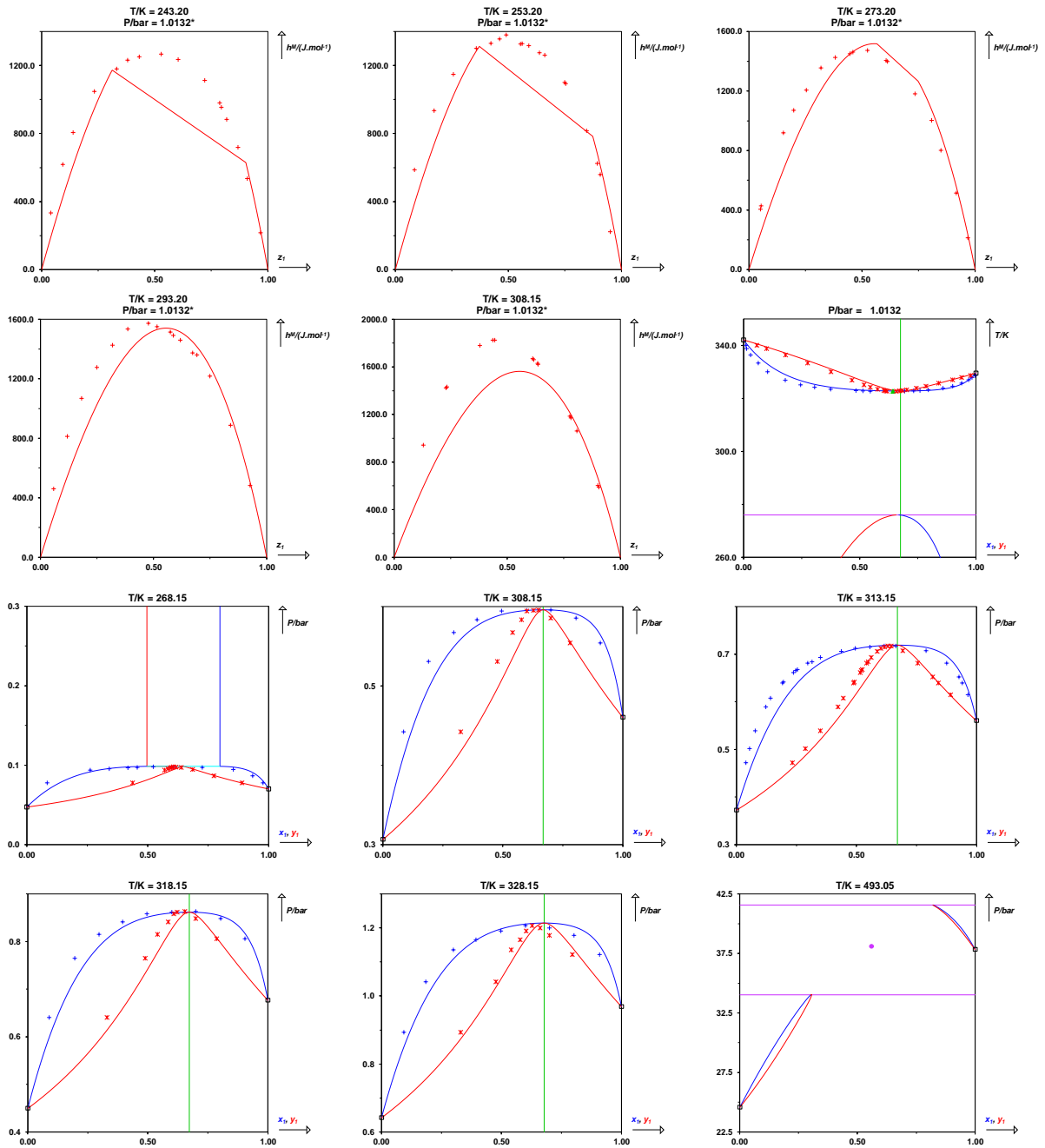
T / K = 308.15

P / bar = UNKNOWN (1.0132)

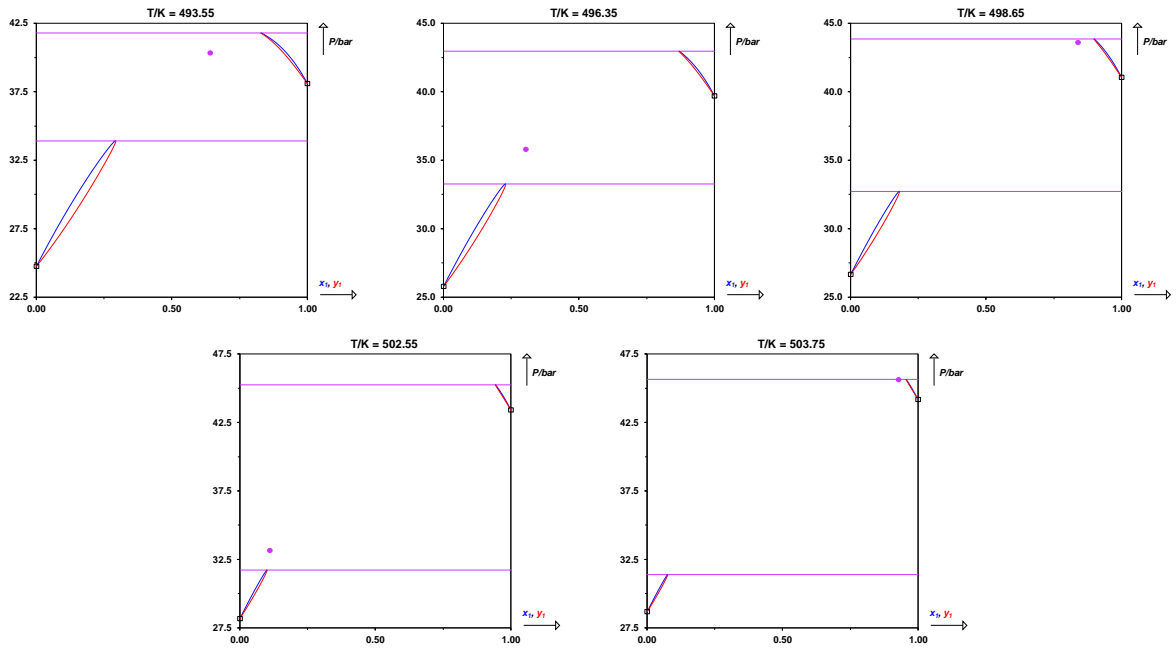
$h^M / \text{J.mol}^{-1}$ x_1

590.00	0.9042
603.00	0.9005
1060.0	0.8069
1171.0	0.7809
1185.0	0.7771
1622.0	0.6349
1629.0	0.6345
1659.0	0.6169
1668.0	0.6120
1825.0	0.4449
1824.0	0.4349

HA-NA systems (BAC = 2)



HA-NA systems (BAC = 2)



METHYL ETHYL KETONE (1) + BENZENE (2)

CAS	78-93-3	71-43-2
InChiKey	ZWEHNKRNPQVVGH-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	535.50	562.05
P_c / bar	41.50	48.95
ω	0.323	0.210

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 6.724$

$B/\text{MPa} = -4.692$

Deviations

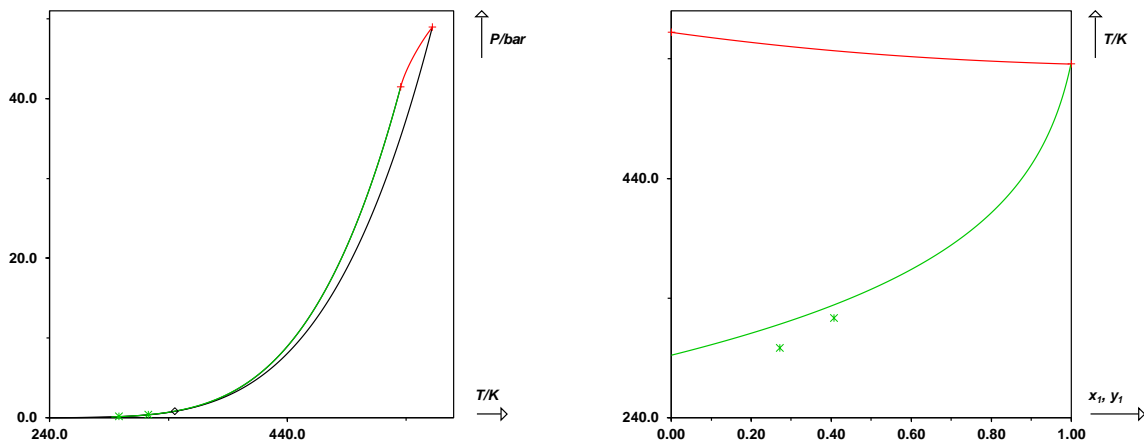
MAPE on $x = 52\%$

MAPE on $y = 51\%$

MAPE on $x_{az} = 35\%$

MAPE on $P_{az} = 0.72\%$

MAPE on $h^M = 63\%$



-----			0.3733	0.7247	0.7063
Isothermal phase equilibrium data			0.3720	0.7572	0.7398
-----			0.3713	0.7749	0.7575
Ohta, Tatsuhiko - Koyabu, Jitsuo - Nagata, Isamu, Vapor—			0.3695	0.8191	0.8034
liquid equilibria for the ternary Ethanol—2-butanone—			0.3674	0.8676	0.8548
benzene system at 298.15 K, Fluid Phase Equilibria. 7			0.3663	0.8887	0.8775
(1981) 65-73. doi:10.1016/0378-3812(81)87006-9			0.3644	0.9262	0.9181
T / K =	298.15		0.3623	0.9652	0.9609
P / bar	x ₁	y ₁	-----		
0.1321	0.0830	0.0940	Isobaric phase equilibrium data		
0.1328	0.1100	0.1220	-----		
0.1339	0.2710	0.2710	Kumarkrishna Rao, V.N. - Swami, D.R. - Narasinga Rao, M.,		
0.1333	0.4000	0.3870	High-pressure vapor-liquid equilibriums of nonideal		
0.1315	0.5180	0.4980	solutions. II. Benzene-methyl ethyl ketone system, J. Sci.		
0.1289	0.6790	0.6520	Ind. Res. Sect. B. 16 (1957) 195-201.		
0.1269	0.7620	0.7360	P / bar = 5.649		
0.1245	0.8540	0.8350	T / K	x ₁	y ₁
0.1219	0.9640	0.9580	421.95	0.1000	0.1140
Diaz Peña, M - Crespo Colin, A - Compostizo, A, Isothermal			420.65	0.2000	0.2220
liquid-vapour equilibria 2. The binary systems formed by			419.95	0.3000	0.3240
benzene + acetone, + methyl ethyl ketone, + methyl			419.45	0.4000	0.4220
propyl ketone, and + methyl isobutyl ketone, The Journal			418.95	0.5000	0.5150
of Chemical Thermodynamics. 10 (1978) 1101-1106.			418.65	0.6000	0.6100
doi:10.1016/0021-9614(78)90084-8			418.35	0.7000	0.7040
T / K =	323.15		Kumarkrishna Rao, V.N. - Swami, D.R. - Narasinga Rao, M.,		
P / bar	x ₁	y ₁	High-pressure vapor-liquid equilibriums of nonideal		
0.3685	0.0774	0.0920	solutions. II. Benzene-methyl ethyl ketone system, J. Sci.		
0.3694	0.0903	0.1061	Ind. Res. Sect. B. 16 (1957) 195-201.		
0.3709	0.1135	0.1306	P / bar = 7.516		
0.3722	0.1328	0.1502	T / K	x ₁	y ₁
0.3734	0.1554	0.1733	435.95	0.1000	0.1180
0.3743	0.1769	0.1945	434.75	0.2000	0.2230
0.3753	0.2117	0.2275	434.05	0.3000	0.3230
0.3761	0.2458	0.2599	433.55	0.4000	0.4210
0.3768	0.2737	0.2847	433.15	0.5000	0.5160
0.3773	0.3056	0.3141	432.85	0.6000	0.6120
0.3777	0.3357	0.3410	432.55	0.7000	0.7100
0.3779	0.3539	0.3571	432.35	0.8000	0.8060
0.3780	0.3737	0.3753	Kumarkrishna Rao, V.N. - Swami, D.R. - Narasinga Rao, M.,		
0.3782	0.3928	0.3925	High-pressure vapor-liquid equilibriums of nonideal		
0.3784	0.4072	0.4072	solutions. II. Benzene-methyl ethyl ketone system, J. Sci.		
0.3784	0.4109	0.4084	Ind. Res. Sect. B. 16 (1957) 195-201.		
0.3782	0.4767	0.4691	P / bar = 10.65		
0.3782	0.5001	0.4909	T / K	x ₁	y ₁
0.3780	0.5271	0.5157	455.95	0.1000	0.1160
0.3776	0.5514	0.5388	454.15	0.2000	0.2180
0.3772	0.5737	0.5599	452.95	0.3000	0.3180
0.3770	0.5892	0.5743	452.35	0.4000	0.4180
0.3767	0.6068	0.5915	-----		
0.3764	0.6255	0.6092	-----		

451.95	0.5000	0.5170	8.280	0.0500
451.55	0.6000	0.6150	9.050	0.0700
451.15	0.7000	0.7120	8.650	0.0900
450.85	0.8000	0.8100	8.270	0.1000
450.65	0.9000	0.9060	7.570	0.1100
			3.520	0.1500
Kumarkrishna Rao, V.N. - Swami, D.R. - Narasinga Rao, M., High-pressure vapor-liquid equilibriums of nonideal solutions. II. Benzene-methyl ethyl ketone system, J. Sci. Ind. Res. Sect. B. 16 (1957) 195-201.			-4.060	0.2000
P / bar = 13.98			-12.83	0.2500
T / K	x ₁	y ₁	-22.03	0.3000
471.75	0.1000	0.1170	-30.66	0.3500
470.15	0.2000	0.2220	-38.37	0.4000
469.25	0.3000	0.3230	-44.71	0.4500
468.65	0.4000	0.4220	-49.53	0.5000
468.05	0.5000	0.5190	-52.70	0.5500
467.55	0.6000	0.6160	-53.98	0.6000
467.05	0.7000	0.7110	-53.29	0.6500
466.65	0.8000	0.8070	-50.70	0.7000
466.35	0.9000	0.9050	-50.65	0.7000
			-46.16	0.7500
			-39.91	0.8000
			-32.12	0.8500
			-22.75	0.9000
Kumarkrishna Rao, V.N. - Swami, D.R. - Narasinga Rao, M., High-pressure vapor-liquid equilibriums of nonideal solutions. II. Benzene-methyl ethyl ketone system, J. Sci. Ind. Res. Sect. B. 16 (1957) 195-201.			-12.01	0.9500

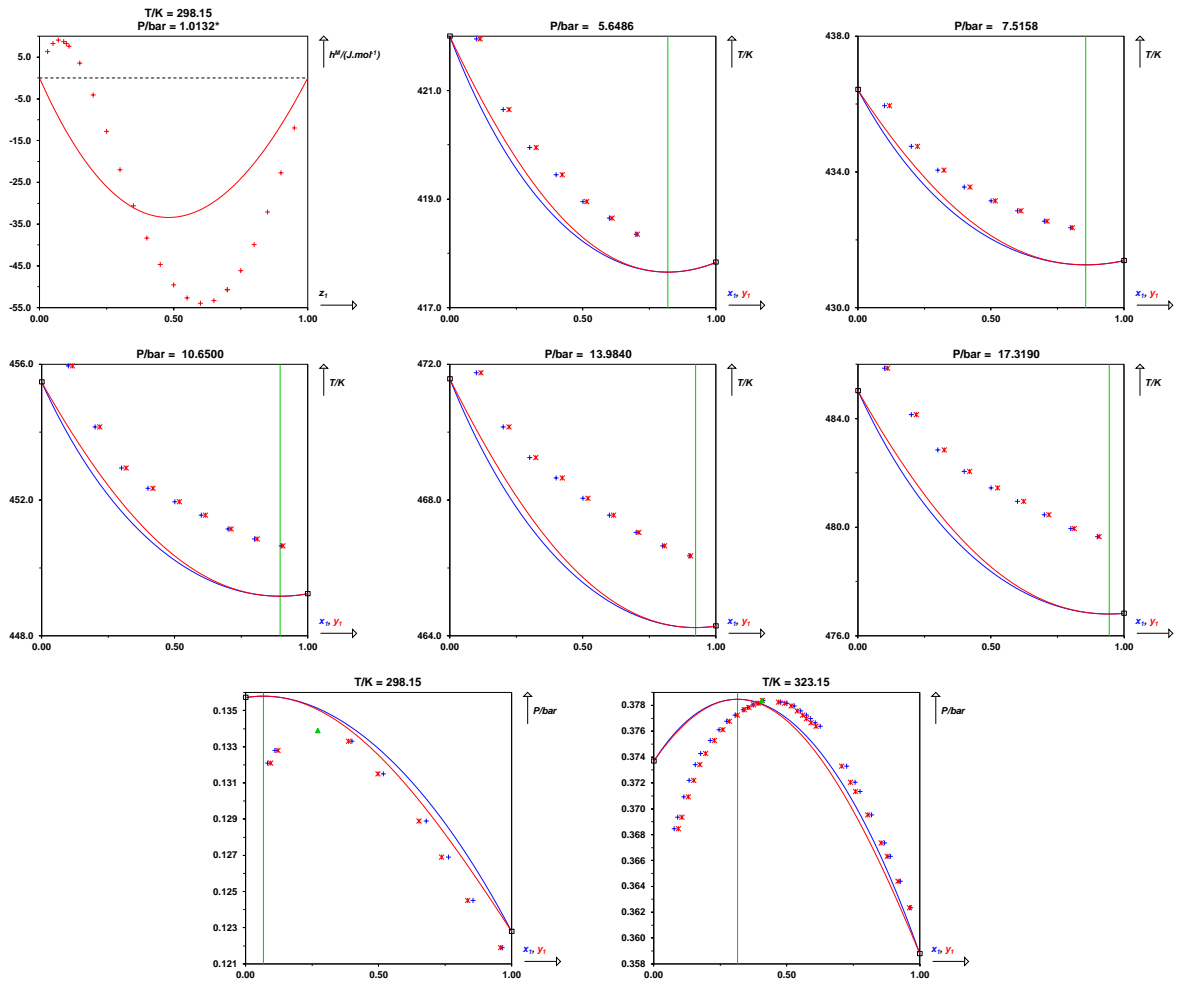
P / bar = 17.32		
T / K	x ₁	y ₁
485.85	0.1000	0.1120
484.15	0.2000	0.2200
482.85	0.3000	0.3240
482.05	0.4000	0.4200
481.45	0.5000	0.5240
480.95	0.6000	0.6230
480.45	0.7000	0.7180
479.95	0.8000	0.8130
479.65	0.9000	0.9070

Enthalpy of mixing

Kiyohara, Osamu - Benson, George C - Grolier, Jean-Pierre E, Thermodynamic properties of binary mixtures containing ketones I. Excess enthalpies of some aliphatic ketones + n-hexane, + benzene, and + tetrachloromethane, The Journal of Chemical Thermodynamics. 9 (1977) 315-323. doi:10.1016/0021-9614(77)90052-0

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
6.260	0.0300

HA-NA systems (BAC = 2)



n-HEXANE (1) + METHYL ETHYL KETONE (2)

CAS	110-54-3	78-93-3
InChiKey	VLKZOEYAKHREP-UHFFFAOYSA-N	ZWEHNKRNPVVGH-UHFFFAOYSA-N
T_c / K	507.60	535.50
P_c / bar	30.25	41.50
ω	0.301	0.323

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 65.92

B/MPa = 86.16

Deviations

MAPE on x = 17 %

MAPE on y = 8.0 %

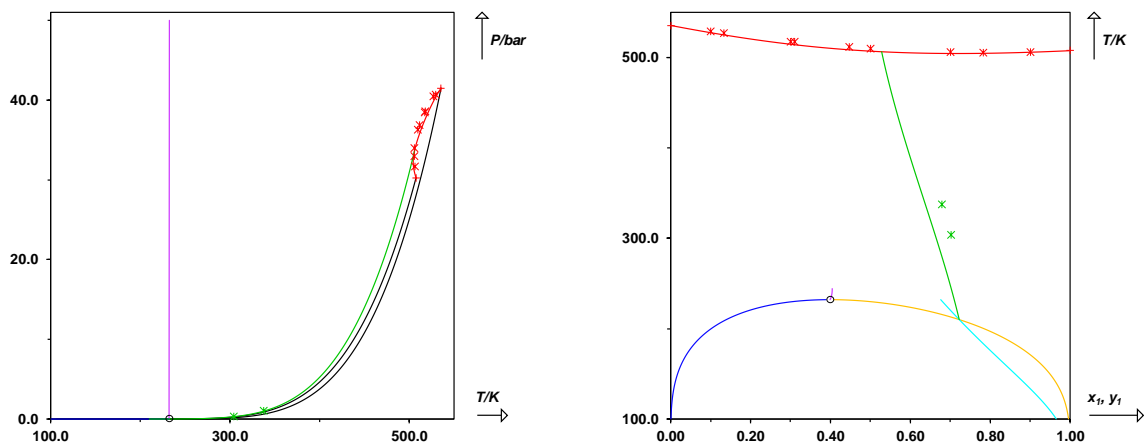
MAPE on x_c = 16 %

MAPE on P_c = 2.6 %

MAPE on x_{az} = 9.5 %

MAPE on P_{az} = 3.1 %

MAPE on h^M = 14 %



Isothermal phase equilibrium data

Hanson, Donald O. - Van Winkle, Matthew, Alteration of the relative volatility of hexane-1-hexene by oxygenated and chlorinated solvents, Journal of Chemical & Engineering Data. 12 (1967) 319-325. doi:10.1021/je60034a009

T / K = 333.15		
P / bar	x ₁	y ₁
0.6690	0.0950	0.2820
0.6702	0.0980	0.2880
0.7587	0.1970	0.4190
0.8078	0.2820	0.4840
0.8466	0.3950	0.5500
0.8643	0.4790	0.5970
0.8758	0.5560	0.6260
0.8815	0.7160	0.6970
0.8725	0.8030	0.7480
0.8553	0.8720	0.8040
0.8343	0.9160	0.8540
0.8030	0.9610	0.9170

Isobaric phase equilibrium data

Lladosa, Estela - Martínez, Nelson F. - Montón, Juan B. - de la Torre, Javier, Measurements and correlation of vapour-liquid equilibria of 2-butanone and hydrocarbons binary systems at two different pressures, Fluid Phase Equilibria. 307 (2011) 24-29. doi:10.1016/j.fluid.2011.05.004

P / bar = 0.3000		
T / K	x ₁	y ₁
317.76	0.0100	0.0560
313.80	0.0520	0.2180
310.48	0.1080	0.3480
308.23	0.1700	0.4340
306.78	0.2390	0.4950
305.54	0.3170	0.5390
304.94	0.3860	0.5800
304.43	0.4590	0.6080
304.08	0.5370	0.6360
303.91	0.6160	0.6650
303.83	0.6970	0.6960
303.90	0.7020	0.7020
303.93	0.7780	0.7330
304.38	0.8580	0.7830
305.40	0.9310	0.8680

AZEO

Lladosa, Estela - Martínez, Nelson F. - Montón, Juan B. - de la Torre, Javier, Measurements and correlation of vapour-liquid equilibria of 2-butanone and hydrocarbons binary systems at two different pressures, Fluid Phase Equilibria. 307 (2011) 24-29. doi:10.1016/j.fluid.2011.05.004

P / bar = 1.013		
T / K	x ₁	y ₁
352.40	0.0020	0.0090
347.18	0.0710	0.2210
344.15	0.1320	0.3330
341.97	0.1970	0.4120
340.45	0.2620	0.4650
339.36	0.3280	0.5110
338.54	0.3990	0.5500
337.95	0.4740	0.5840
337.59	0.5530	0.6190
337.38	0.6280	0.6520
337.40	0.6790	0.6790
337.42	0.7060	0.6910
337.64	0.7830	0.7350
338.30	0.8600	0.7920
339.60	0.9330	0.8760

AZEO

Enthalpy of mixing

Murakami, Sachio - Amaya, Kazuo - Fujishiro, Ryoichi, Heats of Mixing for Binary Mixtures. The Energy of Hydrogen Bonding between Alcohol and Ketone Molecules, Bulletin of the Chemical Society of Japan. 37 (1964) 1776-1780. doi:10.1246/bcsj.37.1776

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
946.63	0.2475
1245.2	0.4453
1267.3	0.5658
1162.3	0.6695
984.74	0.7602
687.47	0.8576
495.30	0.9181
354.62	0.9437

Kiyohara, Osamu - Benson, George C - Grolier, Jean-Pierre E, Thermodynamic properties of binary mixtures containing ketones I. Excess enthalpies of some aliphatic ketones + n-hexane, + benzene, and + tetrachloromethane, The Journal of Chemical Thermodynamics. 9 (1977) 315-323. doi:10.1016/0021-9614(77)90052-0

T / K = 298.15

P / bar =	UNKNOWN (1.0132)
$h^M / \text{J.mol}^{-1}$	x_1
233.80	0.0500
442.30	0.1000
625.80	0.1500
782.50	0.2000
915.50	0.2500
1026.9	0.3000
1114.7	0.3500
1182.8	0.4000
1228.9	0.4500
1252.4	0.5000
1259.1	0.5500
1240.2	0.6000
1200.1	0.6500
1136.4	0.7000
1045.4	0.7500
925.10	0.8000
765.90	0.8500
567.50	0.9000
319.70	0.9500

Critical point

Kay, W.B. - Young, C.L., Gas-liquid critical properties. 2-Butanone (methyl ethyl ketone)-n-hexane system, Int. Data Ser. Sel. Data Mixtures Ser. A. 1975 (1975) 139-156.

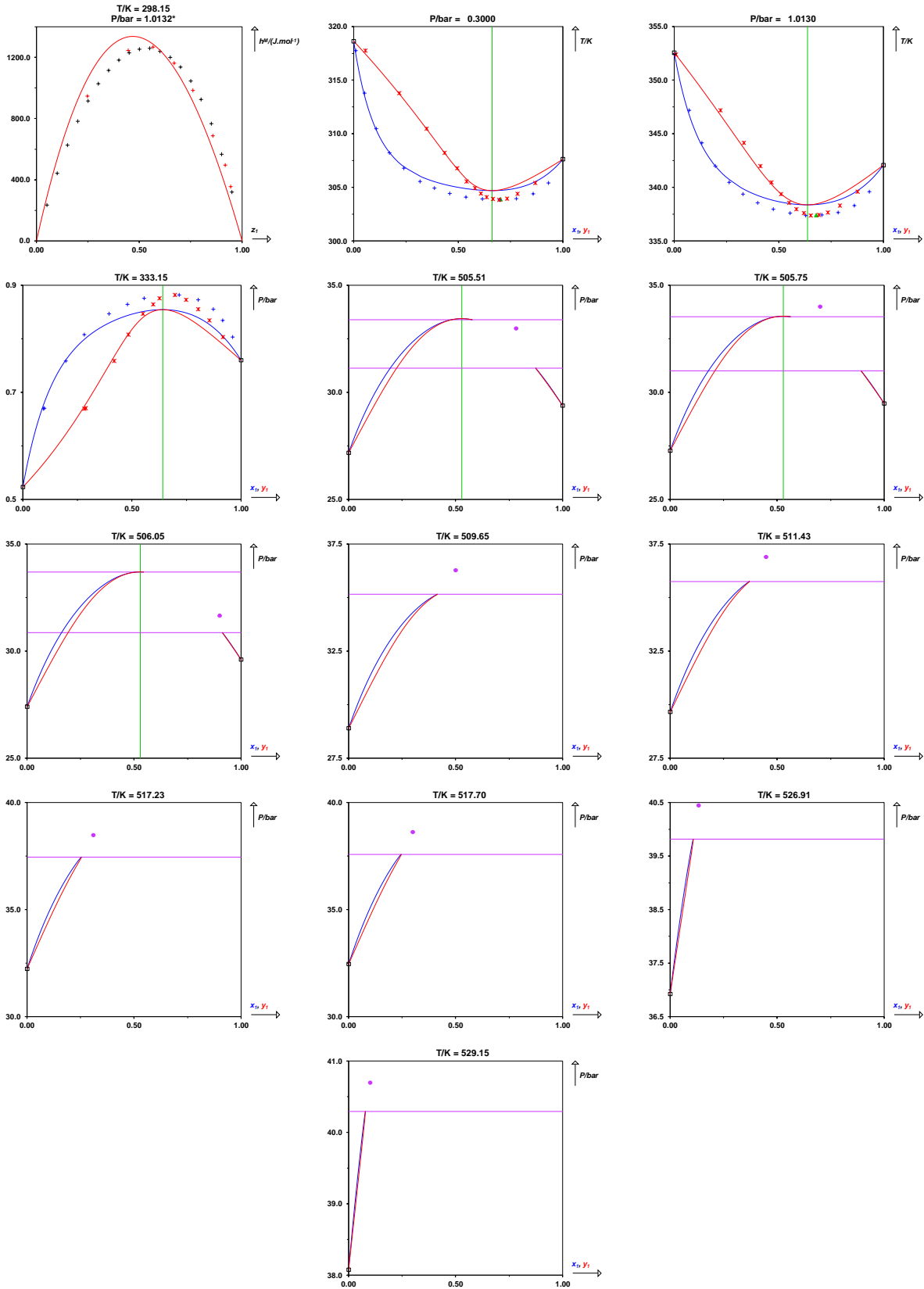
T / K	P / bar	x_1
505.51	32.97	0.7829
511.43	36.89	0.4473
517.23	38.47	0.3098
526.91	40.44	0.1331

Kreglewski, Aleksander - Kay, Webster B., Critical constants of conformed mixtures, The Journal of Physical Chemistry. 73 (1969) 3359-3366.

doi:10.1021/j100844a035

T / K	P / bar	x_1
505.75	33.99	0.7000
506.05	31.65	0.9000
509.65	36.27	0.5000
517.70	38.61	0.3000
529.15	40.69	0.1000

HA-NA systems (BAC = 2)



METHYL tert-BUTYL ETHER (1) + TOLUENE (2)

CAS	1634-04-4	108-88-3
InChiKey	BZLVMXJERCZMT-UHFFFAOYSA-N	YXFVVABEGXRONW-UHFFFAOYSA-N
T_c / K	497.10	591.75
P_c / bar	32.86	41.08
ω	0.247	0.264

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = -0.673

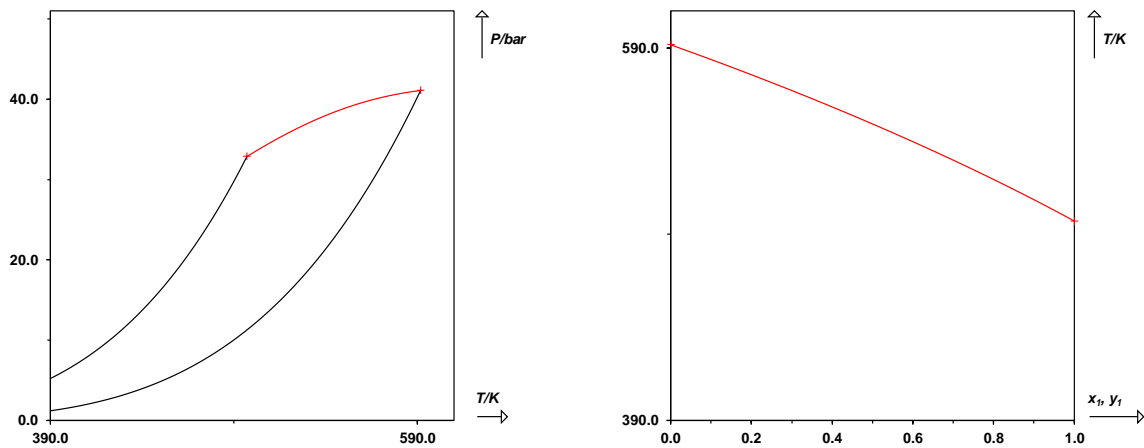
B/MPa = 2.877

Deviations

MAPE on x = 17 %

MAPE on y = 4.3 %

MAPE on h^M = 40 %



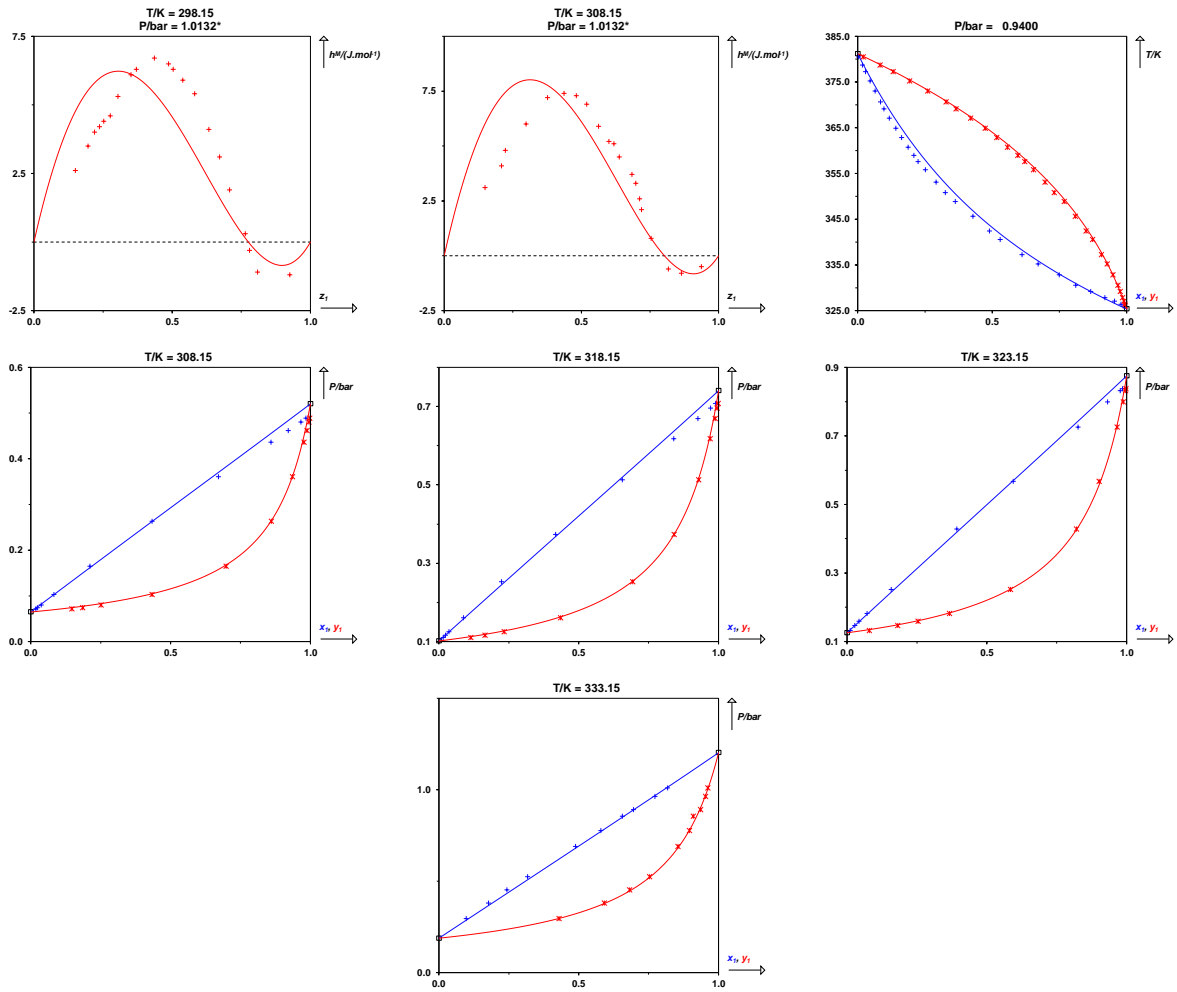
-----			0.2519	0.1580	0.5840
Isothermal phase equilibrium data			0.4278	0.3930	0.8200
-----			0.5676	0.5940	0.9010
Vorenberg, Daniel G. - Raal, J. David - Ramjugernath, Deresh, Vapor-Liquid Equilibrium Measurements of MTBE and TAME with Toluene, Journal of Chemical & Engineering Data. 50 (2005) 56-59. doi:10.1021/je049867t			0.7255	0.8260	0.9660
T / K = 308.15			0.7992	0.9310	0.9870
P / bar	x ₁	y ₁	0.8321	0.9770	0.9960
0.0712	0.0180	0.1470	0.8380	0.9850	0.9970
0.0744	0.0240	0.1850	Plura, Jiří - Matouš, Jaroslav - Novák, Josef P. - Šobr, Josef, Vapour-liquid equilibrium in the methyl tert-butyl ether-n-hexane and methyl tert-butyl ether-toluene systems, Collection of Czechoslovak Chemical Communications. 44 (1979) 3627-3631. doi:10.1135/cccc19793627		
0.0804	0.0370	0.2510	T / K = 333.15		
0.1032	0.0820	0.4340	P / bar	x ₁	y ₁
0.1650	0.2120	0.6980	0.2952	0.0970	0.4300
0.2628	0.4330	0.8600	0.3812	0.1770	0.5910
0.3606	0.6710	0.9360	0.4513	0.2430	0.6820
0.4360	0.8590	0.9770	0.5247	0.3170	0.7530
0.4614	0.9210	0.9880	0.6895	0.4890	0.8540
0.4805	0.9660	0.9950	0.7775	0.5790	0.8960
0.4883	0.9840	0.9970	0.8545	0.6560	0.9100
Vorenberg, Daniel G. - Raal, J. David - Ramjugernath, Deresh, Vapor-Liquid Equilibrium Measurements of MTBE and TAME with Toluene, Journal of Chemical & Engineering Data. 50 (2005) 56-59. doi:10.1021/je049867t			0.8910	0.6950	0.9350
T / K = 318.15			0.9628	0.7730	0.9540
P / bar	x ₁	y ₁	1.010	0.8180	0.9620
0.1099	0.0150	0.1140	-----		
0.1157	0.0230	0.1650	Isobaric phase equilibrium data		
0.1246	0.0360	0.2340	-----		
0.1605	0.0880	0.4350	Reich, Ricardo - Cartes, Marcela - Wisniak, Jaime - Segura, Hugo, Phase Equilibria in the Systems Methyl 1,1-Dimethylethyl Ether + Benzene and + Toluene, Journal of Chemical & Engineering Data. 43 (1998) 299-303. doi:10.1021/je970248c		
0.2527	0.2240	0.6930	P / bar = 0.9400		
0.3736	0.4170	0.8410	T / K	x ₁	y ₁
0.5124	0.6560	0.9290	380.47	0.0040	0.0210
0.6173	0.8390	0.9700	378.74	0.0170	0.0830
0.6687	0.9260	0.9870	377.24	0.0290	0.1320
0.6961	0.9710	0.9950	375.24	0.0460	0.1930
0.7074	0.9890	0.9980	373.00	0.0640	0.2600
Vorenberg, Daniel G. - Raal, J. David - Ramjugernath, Deresh, Vapor-Liquid Equilibrium Measurements of MTBE and TAME with Toluene, Journal of Chemical & Engineering Data. 50 (2005) 56-59. doi:10.1021/je049867t			370.62	0.0850	0.3280
T / K = 323.15			369.13	0.0980	0.3660
P / bar	x ₁	y ₁	367.07	0.1180	0.4200
0.1320	0.0110	0.0800	364.86	0.1410	0.4740
0.1465	0.0280	0.1810	362.89	0.1630	0.5160
0.1589	0.0430	0.2540	360.71	0.1870	0.5570
0.1818	0.0710	0.3660	358.93	0.2090	0.5950
			357.55	0.2250	0.6210
			355.77	0.2520	0.6530
			353.12	0.2910	0.6960

350.83	0.3260	0.7310	Letcher, Trevor M - Domańska, Urszula, Excess molar enthalpies of (2,2,4-trimethylpentane, or 1-heptene, or 1-hexene, or toluene+methyl 1,1-dimethylethyl ether) and of (1-heptene, or 1-hexene, or toluene+1,1-dimethylpropyl ether) at the temperatures 298.15 K and 308.15 K, The Journal of Chemical Thermodynamics. 29 (1997) 721-730. doi:10.1006/jcht.1997.0198
348.83	0.3630	0.7670	
345.66	0.4280	0.8090	
342.41	0.4890	0.8490	
340.53	0.5300	0.8730	
337.28	0.6110	0.9060	
335.18	0.6700	0.9280	T / K = 308.15
332.81	0.7490	0.9490	P / bar = UNKNOWN (1.0132)
330.53	0.8110	0.9670	$h^M / J.mol^{-1}$ x_1
329.21	0.8660	0.9760	3.100 0.1480
327.79	0.9190	0.9850	4.100 0.2084
327.06	0.9540	0.9900	4.800 0.2230
326.37	0.9790	0.9930	6.000 0.2981
326.05	0.9900	0.9950	7.200 0.3764
			7.400 0.4362
			7.300 0.4814
			6.900 0.5187
			5.900 0.5620
			5.200 0.5998
			5.100 0.6187
			4.500 0.6380
			3.700 0.6835
			3.300 0.6986
			2.600 0.7120
			2.100 0.7187
			0.8000 0.7537
			-0.6000 0.8168
			-0.8000 0.8649
			-0.5000 0.9375

Enthalpy of mixing			

Letcher, Trevor M - Domańska, Urszula, Excess molar enthalpies of (2,2,4-trimethylpentane, or 1-heptene, or 1-hexene, or toluene+methyl 1,1-dimethylethyl ether) and of (1-heptene, or 1-hexene, or toluene+1,1-dimethylpropyl ether) at the temperatures 298.15 K and 308.15 K, The Journal of Chemical Thermodynamics. 29 (1997) 721-730. doi:10.1006/jcht.1997.0198			
T / K = 298.15			
P / bar = UNKNOWN (1.0132)			
$h^M / J.mol^{-1}$	x_1		
2.600	0.1493		
3.500	0.1950		
4.000	0.2188		
4.200	0.2372		
4.400	0.2523		
4.600	0.2758		
5.300	0.3030		
6.100	0.3510		
6.300	0.3704		
6.700	0.4360		
6.500	0.4865		
6.300	0.5036		
5.900	0.5379		
5.400	0.5808		
4.100	0.6325		
3.100	0.6712		
1.900	0.7079		
0.3000	0.7643		
-0.3000	0.7798		
-1.100	0.8088		
-1.200	0.9250		

HA-NA systems (BAC = 2)



METHYL tert-BUTYL ETHER (1) + n-HEPTANE (2)

CAS	1634-04-4	142-82-5
InChiKey	BZLVMXJERCGZMT-UHFFFAOYSA-N	IMNFDUFMRHMDMM-UHFFFAOYSA-N
T_c / K	497.10	540.20
P_c / bar	32.86	27.40
ω	0.247	0.349

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 7.477$

$B/\text{MPa} = 24.48$

Deviations

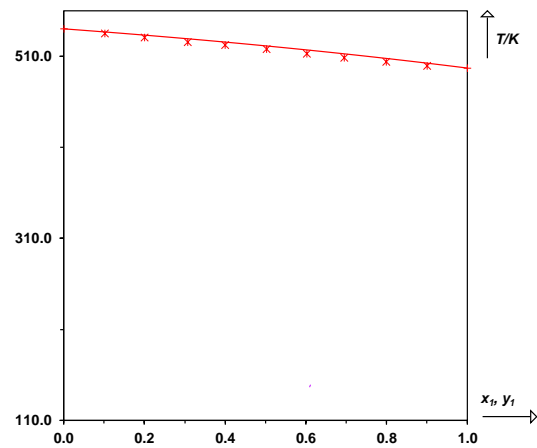
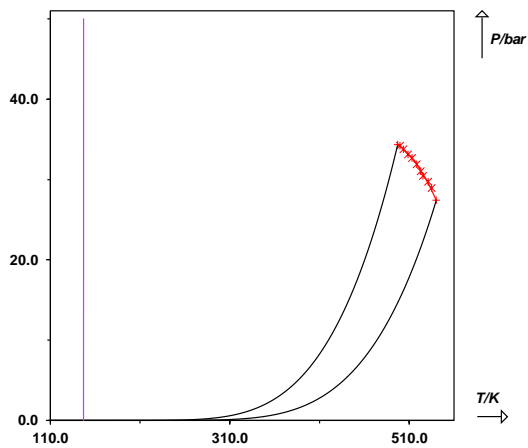
MAPE on $x = 7.2\%$

MAPE on $y = 4.3\%$

MAPE on $x_c = 21\%$

MAPE on $P_c = 2.5\%$

MAPE on $h^M = 3.2\%$



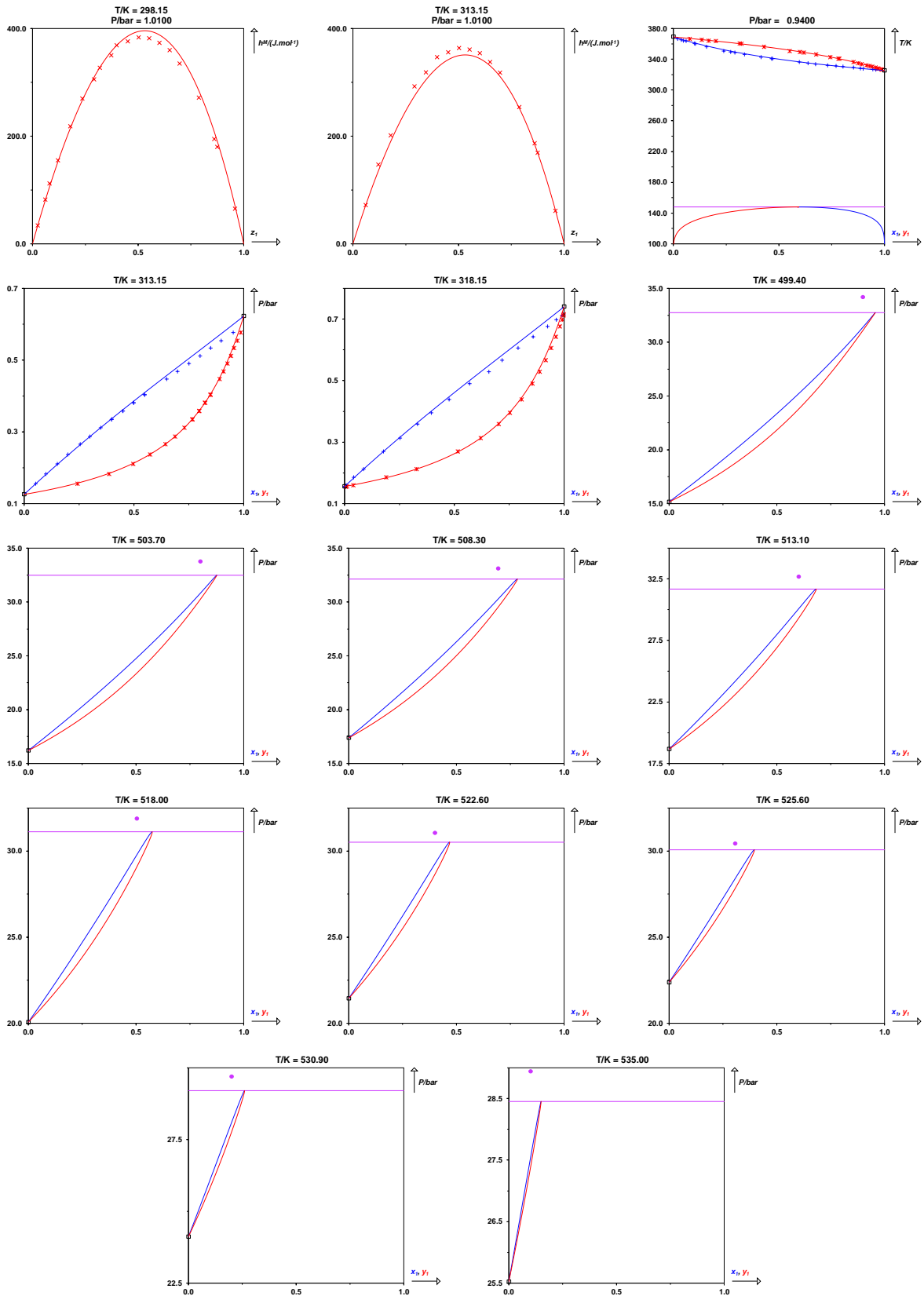
Isothermal phase equilibrium data			0.4390	0.4768	0.8063
Segovia, José J - Martín, María C - R. Chamorro, César -			0.4901	0.5700	0.8559
Montero, Eduardo A - Villamañán, Miguel A, Excess			0.5290	0.6567	0.8888
thermodynamic functions for ternary systems containing			0.5661	0.7176	0.9165
fuel oxygenates and substitution hydrocarbons: 2. Total-			0.6057	0.7895	0.9417
pressure data and GE for methyl tert-butyl ether/n-			0.6422	0.8592	0.9625
heptane/1-hexene at 313.15 K This paper is part of the			0.6766	0.9252	0.9807
doctoral thesis of J.J. Segovia.1, Fluid Phase Equilibria. 152			0.6982	0.9643	0.9912
(1998) 265-276. doi:10.1016/S0378-3812(98)00384-7			0.7122	0.9906	0.9977
T / K = 313.15			0.7158	0.9972	0.9993
P / bar	x ₁	y ₁	Isobaric phase equilibrium data		
0.1550	0.0521	0.2426	Wisniak, Jaime - Magen, Erez - Shachar, Michal - Zeroni,		
0.1826	0.0996	0.3863	Ilan - Reich, Ricardo - Segura, Hugo, Isobaric Vapor-Liquid		
0.2107	0.1512	0.4970	Equilibria in the Systems Methyl 1,1-Dimethylethyl Ether		
0.2365	0.1990	0.5738	+ Hexane and + Heptane, Journal of Chemical &		
0.2658	0.2554	0.6440	Engineering Data. 42 (1997) 243-247.		
0.2872	0.2988	0.6876	doi:10.1021/je960301h		
0.3116	0.3490	0.7301	P / bar = 0.9400		
0.3346	0.3976	0.7650	T / K	x ₁	y ₁
0.3354	0.3997	0.7665	366.45	0.0210	0.0780
0.3581	0.4483	0.7966	365.35	0.0380	0.1340
0.3584	0.4499	0.7975	364.25	0.0480	0.1670
0.3808	0.4982	0.8237	363.65	0.0600	0.2020
0.3809	0.4989	0.8241	360.55	0.1000	0.3140
0.4034	0.5487	0.8482	359.95	0.1050	0.3230
0.4037	0.5494	0.8485	356.25	0.1570	0.4290
0.4470	0.6490	0.8900	350.55	0.2390	0.5510
0.4687	0.6984	0.9081	349.25	0.2720	0.6000
0.4905	0.7501	0.9258	348.55	0.2920	0.6180
0.5120	0.8009	0.9421	346.25	0.3370	0.6770
0.5333	0.8490	0.9568	342.85	0.4150	0.7430
0.5544	0.8978	0.9711	340.75	0.4650	0.7820
0.5770	0.9514	0.9864	340.65	0.4700	0.7860
Lee, J.D. - Lee, T.J. - Park, S.J., Infinite dilution activity			336.55	0.5970	0.8530
coefficients and vapor-liquid equilibria for the binary			334.85	0.6380	0.8760
systems containing MTBE, Hwahak Konghak. 33 (1995)			333.75	0.6740	0.8920
527-534.			332.15	0.7300	0.9150
T / K = 318.15			331.15	0.7710	0.9290
P / bar	x ₁	y ₁	330.45	0.8030	0.9410
0.1551	0.0007	0.0052	329.15	0.8530	0.9570
0.1559	0.0019	0.0106	328.15	0.8860	0.9670
0.1598	0.0070	0.0405	327.85	0.8990	0.9710
0.1859	0.0416	0.1899	326.85	0.9440	0.9840
0.2124	0.0868	0.3280	326.45	0.9580	0.9880
0.2698	0.1768	0.5161			
0.3135	0.2527	0.6206			
0.3590	0.3316	0.7020			
0.3949	0.3954	0.7536			

-----		317.80	0.6958
Enthalpy of mixing		254.00	0.7870
-----		186.90	0.8603
Tusel-Langer, E. - Garcia Alonso, J. M. - Villamañan Olfos, M. A. - Lichtenthaler, R. N., Excess enthalpies of mixtures containing n-heptane, methanol and methyl tert-butyl ether (MTBE), Journal of Solution Chemistry. 20 (1991) 153-163. doi:10.1007/BF00651647		169.00	0.8747
T / K =	298.15	61.30	0.9590
P / bar =	1.010	-----	
h^M / J.mol⁻¹	z₁	Critical point	
34.20	0.0245	-----	
82.30	0.0609	Han, Kewei - Xia, Shuqian - Ma, Peisheng - Yan, Fangyou - Liu, Tao, Measurement of critical temperatures and critical pressures for binary mixtures of methyl tert-butyl ether (MTBE)+alcohol and MTBE+alkane, The Journal of Chemical Thermodynamics. 62 (2013) 111-117. doi:10.1016/j.jct.2013.03.002	
111.90	0.0809	T / K	P / bar x ₁
155.30	0.1204	499.40	34.17 0.9000
218.60	0.1785	503.70	33.75 0.7989
270.10	0.2354	508.30	33.10 0.6944
305.30	0.2911	513.10	32.67 0.6022
327.10	0.3184	518.00	31.88 0.5030
350.20	0.3723	522.60	31.05 0.4004
368.80	0.3988	525.60	30.43 0.3067
376.10	0.4509	530.90	29.69 0.1999
383.20	0.5019	535.00	28.94 0.1016
381.60	0.5519		
373.10	0.6009		
359.50	0.6488		
334.60	0.6958		
271.50	0.7870		
194.90	0.8603		
180.20	0.8747		
65.20	0.9590		

Tusel-Langer, E. - Garcia Alonso, J. M. - Villamañan Olfos, M. A. - Lichtenthaler, R. N., Excess enthalpies of mixtures containing n-heptane, methanol and methyl tert-butyl ether (MTBE), Journal of Solution Chemistry. 20 (1991) 153-163. doi:10.1007/BF00651647

T / K =	313.15
P / bar =	1.010
h^M / J.mol⁻¹	z₁
71.80	0.0609
147.20	0.1204
201.30	0.1785
292.40	0.2911
318.40	0.3455
346.50	0.3988
355.90	0.4509
363.80	0.5019
361.00	0.5519
354.00	0.6009
337.60	0.6488

HA-NA systems (BAC = 2)



METHYL tert-PENTYL ETHER (1) + n-HEPTANE (2)

CAS	994-05-8	142-82-5
InChiKey	HVZJRWJGKQPSFL-UHFFFAOYSA-N	IMNFDUFMRHMDMM-UHFFFAOYSA-N
T_c / K	534.00	540.20
P_c / bar	30.40	27.40
ω	0.298	0.349

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 6.932$

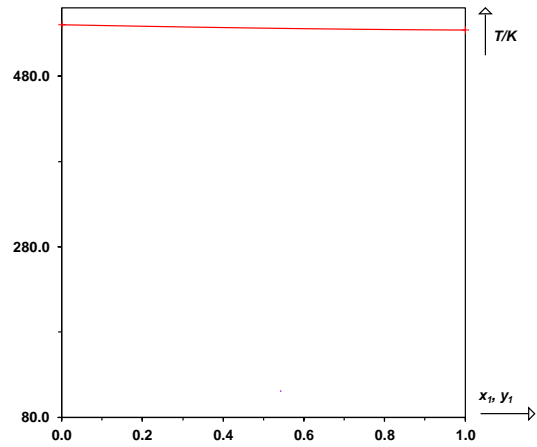
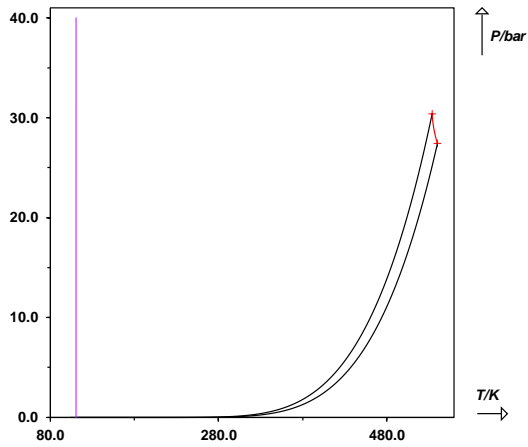
$B/\text{MPa} = 15.94$

Deviations

MAPE on $x = 9.9\%$

MAPE on $y = 8.7\%$

MAPE on $h^M = 2.7\%$



-----				342.28	0.4450	0.5560
Isothermal phase equilibrium data				341.85	0.4890	0.5920
-----				341.31	0.5420	0.6390
Chamorro, César R - Segovia, José J - Martín, María C - Montero, Eduardo A - Villamañán, Miguel A, Phase equilibrium properties of binary and ternary systems containing tert-amylmethyl ether (TAME) as oxygenate additive and gasoline substitution hydrocarbons at 313.15 K, Fluid Phase Equilibria. 156 (1999) 73-87. doi:10.1016/S0378-3812(99)00033-3				340.79	0.5920	0.6820
T / K = 313.15				340.25	0.6400	0.7230
P / bar	x ₁	y ₁		339.81	0.6940	0.7660
0.1281	0.0440	0.0772		339.44	0.7420	0.8040
0.1335	0.0986	0.1637		339.06	0.7920	0.8410
0.1383	0.1499	0.2373		338.73	0.8430	0.8800
0.1428	0.1986	0.3013		338.35	0.8920	0.9170
0.1471	0.2484	0.3617		338.02	0.9430	0.9560
0.1513	0.2988	0.4182				
0.1553	0.3491	0.4711		Mejía, Andrés - Segura, Hugo - Cartes, Marcela, Vapor-Liquid Equilibrium in the Binary Systems 2-Butanol + tert-Amyl Methyl Ether, 2-Butanol + Heptane, and Heptane + tert-Amyl Methyl Ether, Journal of Chemical & Engineering Data. 56 (2011) 2256-2265. doi:10.1021/je101250d		
0.1628	0.4491	0.5670		P / bar = 0.7500		
0.1628	0.4493	0.5671		T / K	x ₁	y ₁
0.1698	0.5486	0.6536		359.34	0.1150	0.1740
0.1698	0.5495	0.6543		358.47	0.1660	0.2400
0.1731	0.5990	0.6951		357.71	0.2170	0.3030
0.1732	0.6009	0.6966		357.01	0.2620	0.3560
0.1763	0.6496	0.7354		356.20	0.3090	0.4080
0.1793	0.6988	0.7738		355.73	0.3550	0.4580
0.1821	0.7456	0.8096		355.02	0.4000	0.5030
0.1851	0.7986	0.8496		354.57	0.4440	0.5470
0.1878	0.8482	0.8867		353.98	0.4890	0.5880
0.1906	0.8999	0.9252		353.48	0.5410	0.6340
0.1927	0.9420	0.9566		352.97	0.5920	0.6770
-----				352.50	0.6400	0.7180
Isobaric phase equilibrium data				352.01	0.6930	0.7620
-----				351.62	0.7420	0.8000
Mejía, Andrés - Segura, Hugo - Cartes, Marcela, Vapor-Liquid Equilibrium in the Binary Systems 2-Butanol + tert-Amyl Methyl Ether, 2-Butanol + Heptane, and Heptane + tert-Amyl Methyl Ether, Journal of Chemical & Engineering Data. 56 (2011) 2256-2265. doi:10.1021/je101250d				351.23	0.7920	0.8390
P / bar = 0.5000				350.87	0.8420	0.8780
T / K	x ₁	y ₁		350.49	0.8910	0.9160
347.05	0.1150	0.1770		350.18	0.9410	0.9540
346.23	0.1660	0.2450				
345.44	0.2170	0.3090		Mejía, Andrés - Segura, Hugo - Cartes, Marcela, Vapor-Liquid Equilibrium in the Binary Systems 2-Butanol + tert-Amyl Methyl Ether, 2-Butanol + Heptane, and Heptane + tert-Amyl Methyl Ether, Journal of Chemical & Engineering Data. 56 (2011) 2256-2265. doi:10.1021/je101250d		
344.74	0.2630	0.3620		P / bar = 0.9400		
344.01	0.3090	0.4140		T / K	x ₁	y ₁
343.45	0.3550	0.4630		366.70	0.1150	0.1700
342.88	0.4010	0.5090		365.80	0.1650	0.2370
				364.88	0.2170	0.3000
				364.31	0.2620	0.3530

HA-NA systems (BAC = 2)

363.50	0.3090	0.4040	282.40	0.4002
363.01	0.3540	0.4560	290.70	0.4502
362.30	0.4000	0.4990	293.60	0.5003
361.78	0.4430	0.5420	293.80	0.5004
361.25	0.4890	0.5840	291.20	0.5500
360.78	0.5410	0.6300	282.70	0.6000
360.27	0.5910	0.6730	267.80	0.6503
359.80	0.6390	0.7140	247.20	0.7002
359.29	0.6930	0.7590	220.80	0.7500
358.86	0.7410	0.7970	187.70	0.8002
358.46	0.7910	0.8380	149.30	0.8502
358.11	0.8420	0.8770	104.90	0.9000
357.73	0.8900	0.9150	53.80	0.9500
357.39	0.9410	0.9540		

Enthalpy of mixing

Kammerer, K. - Lichtenthaler, R.N., Excess enthalpy HE of binary mixtures containing alkanes, methanol and tert-amyl-methyl ether (TAME), Thermochemica Acta. 271 (1996) 49-58. doi:10.1016/0040-6031(95)02588-X

T / K = 298.15

P / bar = 1.013

$h^M / J.mol^{-1}$ z_1

97.30	0.0930
183.40	0.1960
236.10	0.2840
275.40	0.3870
294.80	0.5150
283.10	0.5940
250.50	0.7060
200.20	0.7960
112.70	0.8970

Kammerer, K. - Lichtenthaler, R.N., Excess enthalpy HE of binary mixtures containing alkanes, methanol and tert-amyl-methyl ether (TAME), Thermochemica Acta. 271 (1996) 49-58. doi:10.1016/0040-6031(95)02588-X

T / K = 313.15

P / bar = 1.013

$h^M / J.mol^{-1}$ z_1

87.70	0.0930
167.50	0.1960
206.00	0.2840
243.00	0.3870
267.80	0.5150
261.80	0.5940
224.60	0.7060
183.40	0.7960
102.70	0.8970

Tong, Zhangfa - Benson, George C. - Wang, Laurie Luo - Lu, Benjamin C.-Y., Excess Enthalpies of Ternary Mixtures Consisting of a Normal Alkane, Methyl tert-Butyl Ether, and tert-Amyl Methyl Ether, Journal of Chemical & Engineering Data. 41 (1996) 865-869. doi:10.1021/je960078o

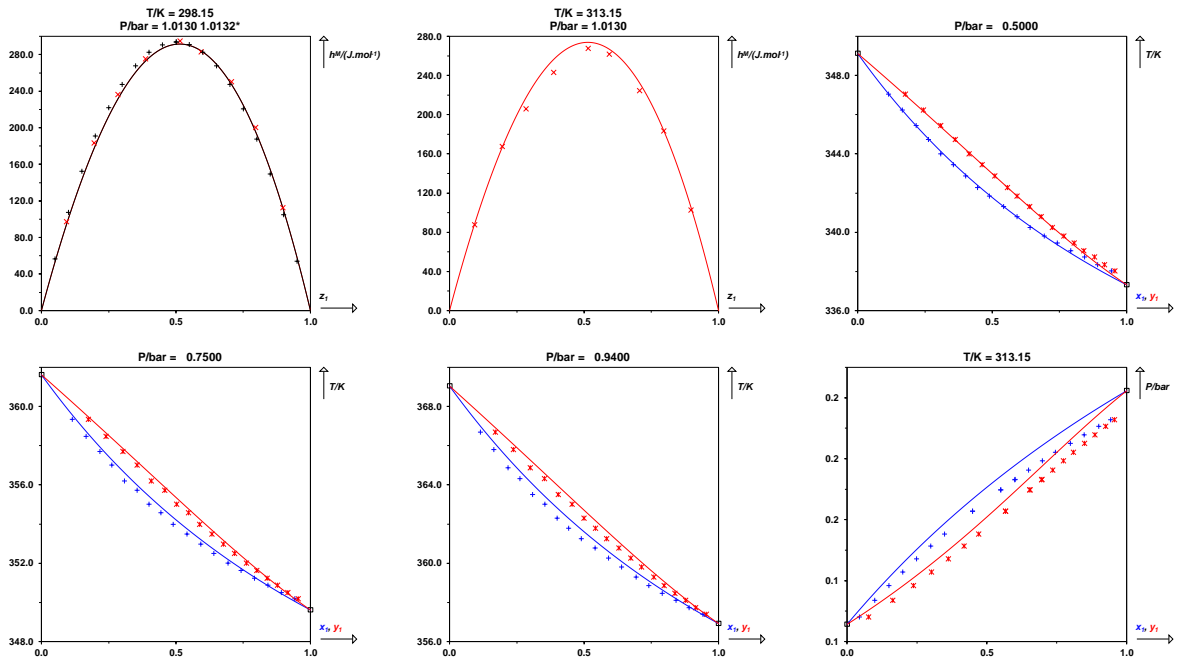
T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

56.70	0.0501
107.40	0.1001
152.20	0.1501
190.80	0.2001
222.00	0.2501
247.40	0.3001
267.80	0.3501

HA-NA systems (BAC = 2)



CARBON TETRACHLORIDE (1) + 1,4-DIOXANE (2)

CAS	56-23-5	123-91-1
InChiKey	VZGDMQKNWNREIO-UHFFFAOYSA-N	RYHBNJHYFVUHQT-UHFFFAOYSA-N
T_c / K	556.35	587.00
P_c / bar	45.60	52.08
ω	0.193	0.279

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 9.347$

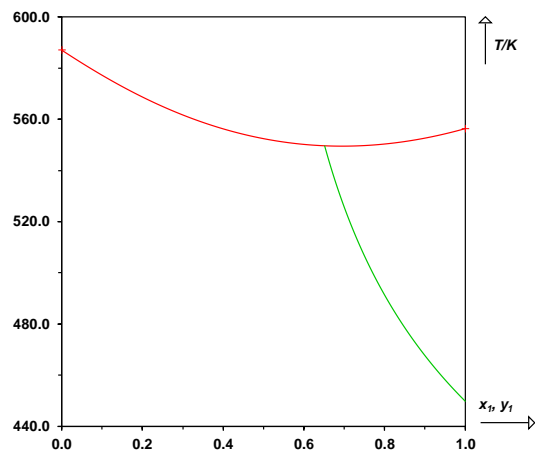
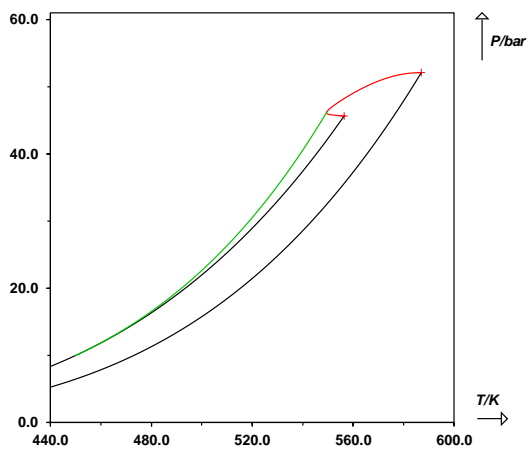
$B/\text{MPa} = -25.01$

Deviations

MAPE on $x = 5.4\%$

MAPE on $y = 5.3\%$

MAPE on $h^M = 15\%$



-----			0.0939	0.2000	0.4720
Isothermal phase equilibrium data			0.1017	0.2500	0.5440
-----			0.1096	0.3000	0.6040
Steinbrecher, M. - Bittrich, H.-J., Das isotherme Flüssigkeits-Dampf-Gleichgewicht der binären Systeme zwischen den Komponenten Tetrachlormethan, Äthylacetat und Dioxan, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23228			0.1171	0.3500	0.6540
T / K = 293.15			0.1243	0.4000	0.6980
P / bar	x_1		0.1311	0.4500	0.7350
0.0483	0.0930		0.1375	0.5000	0.7670
0.0543	0.1550		0.1436	0.5500	0.7960
0.0665	0.2620		0.1493	0.6000	0.8220
0.0764	0.3690		0.1547	0.6500	0.8450
0.0847	0.4690		0.1597	0.7000	0.8670
0.0880	0.5030		0.1645	0.7500	0.8880
0.0944	0.5820		0.1692	0.8000	0.9090
0.1021	0.6780		0.1740	0.8500	0.9300
0.1091	0.7820		0.1788	0.9000	0.9530
0.1157	0.8840		Drobig, J. - Lindenau, E., A new apparatus to determine the isothermal liquid-vapor equilibrium, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 144-147.		
0.1168	0.9030		T / K = 313.15		
0.1187	0.9430		P / bar	x_1	y_1
Steinbrecher, M. - Bittrich, H.-J., Das isotherme Flüssigkeits-Dampf-Gleichgewicht der binären Systeme zwischen den Komponenten Tetrachlormethan, Äthylacetat und Dioxan, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23228			0.1132	0.0500	0.1540
T / K = 293.15			0.1255	0.1000	0.2760
P / bar	y_1		0.1373	0.1500	0.3750
0.1139	0.9430		0.1491	0.2000	0.4570
0.1068	0.9030		0.1603	0.2500	0.5250
0.1049	0.8840		0.1712	0.3000	0.5830
0.0899	0.7820		0.1816	0.3500	0.6330
0.0765	0.6780		0.1916	0.4000	0.6760
0.0675	0.5820		0.2012	0.4500	0.7140
0.0612	0.5030		0.2103	0.5000	0.7480
0.0579	0.4690		0.2188	0.5500	0.7780
0.0517	0.3690		0.2271	0.6000	0.8060
0.0475	0.2620		0.2349	0.6500	0.8320
0.0421	0.1550		0.2424	0.7000	0.8560
0.0399	0.0930		0.2496	0.7500	0.8800
Drobig, J. - Lindenau, E., A new apparatus to determine the isothermal liquid-vapor equilibrium, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 144-147.			0.2567	0.8000	0.9030
T / K = 303.15			0.2636	0.8500	0.9260
P / bar	x_1	y_1	0.2705	0.9000	0.9500
0.0697	0.0500	0.1550	0.2776	0.9500	0.9750
0.0777	0.1000	0.2820	Drobig, J. - Lindenau, E., A new apparatus to determine the isothermal liquid-vapor equilibrium, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 144-147.		
0.0857	0.1500	0.3860	T / K = 323.15		
			P / bar	x_1	y_1
			0.1764	0.0500	0.1480
			0.1940	0.1000	0.2660
			0.2111	0.1500	0.3610
			0.2273	0.2000	0.4400

HA-NA systems (BAC = 2)

0.2431	0.2500	0.5070	0.5112	0.2500	0.4730
0.2581	0.3000	0.5640	0.5382	0.3000	0.5300
0.2725	0.3500	0.6140	0.5640	0.3500	0.5800
0.2862	0.4000	0.6570	0.5888	0.4000	0.6250
0.2993	0.4500	0.6960	0.6124	0.4500	0.6660
0.3120	0.5000	0.7310	0.6350	0.5000	0.7030
0.3240	0.5500	0.7630	0.6569	0.5500	0.7380
0.3354	0.6000	0.7930	0.6778	0.6000	0.7700
0.3465	0.6500	0.8210	0.6981	0.6500	0.8010
0.3572	0.7000	0.8470	0.7175	0.7000	0.8310
0.3676	0.7500	0.8730	0.7363	0.7500	0.8590
0.3776	0.8000	0.8980	0.7546	0.8000	0.8870
0.3874	0.8500	0.9220	0.7722	0.8500	0.9140
0.3972	0.9000	0.9480	0.7893	0.9000	0.9420
0.4068	0.9500	0.9740	0.8058	0.9500	0.9700

Drobig, J. - Lindenau, E., A new apparatus to determine the isothermal liquid-vapor equilibrium, *Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg*. 8 (1966) 144-147.

T / K = 333.15

P / bar	x ₁	y ₁
0.2657	0.0500	0.1410
0.2902	0.1000	0.2540
0.3136	0.1500	0.3460
0.3358	0.2000	0.4240
0.3572	0.2500	0.4890
0.3776	0.3000	0.5460
0.3970	0.3500	0.5960
0.4157	0.4000	0.6400
0.4334	0.4500	0.6800
0.4506	0.5000	0.7170
0.4669	0.5500	0.7500
0.4828	0.6000	0.7810
0.4978	0.6500	0.8110
0.5125	0.7000	0.8390
0.5268	0.7500	0.8660
0.5405	0.8000	0.8920
0.5538	0.8500	0.9180
0.5669	0.9000	0.9450
0.5798	0.9500	0.9720

Drobig, J. - Lindenau, E., A new apparatus to determine the isothermal liquid-vapor equilibrium, *Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg*. 8 (1966) 144-147.

T / K = 343.15

P / bar	x ₁	y ₁
0.3889	0.0500	0.1340
0.4217	0.1000	0.2420
0.4530	0.1500	0.3320
0.4828	0.2000	0.4080

Drobig, J. - Lindenau, E., A new apparatus to determine the isothermal liquid-vapor equilibrium, *Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg*. 8 (1966) 144-147.

T / K = 353.15

P / bar	x ₁	y ₁
0.5546	0.0500	0.1270
0.5977	0.1000	0.2320
0.6385	0.1500	0.3190
0.6773	0.2000	0.3930
0.7142	0.2500	0.4580
0.7493	0.3000	0.5140
0.7829	0.3500	0.5650
0.8150	0.4000	0.6110
0.8457	0.4500	0.6520
0.8751	0.5000	0.6910
0.9035	0.5500	0.7260
0.9307	0.6000	0.7600
0.9569	0.6500	0.7920
0.9822	0.7000	0.8230
1.007	0.7500	0.8520
1.030	0.8000	0.8810
1.052	0.8500	0.9100
1.074	0.9000	0.9390
1.095	0.9500	0.9690

Enthalpy of mixing

Guillen, M.D. - Gutierrez Losa, C., Excess enthalpies and excess volumes of n-hexane + and of tetrachloromethane + furan, + 1,4-dioxane, + tetrahydrofuran, and + tetrahydropyran, *The Journal of Chemical Thermodynamics*. 10 (1978) 567-576. doi:10.1016/0021-9614(78)90045-9

T / K = 283.15

HA-NA systems (BAC = 2)

P / bar =	UNKNOWN (1.0132)	-152.71	0.7867
$h^M / \text{J.mol}^{-1}$	x_1	-121.02	0.8349
-133.00	0.1094	-120.78	0.8360
-240.00	0.2252	-88.43	0.8814
-354.00	0.3656	-85.89	0.8848
-387.00	0.4585	-55.18	0.9261
-389.00	0.5441	-51.11	0.9315
-364.00	0.5903	-25.33	0.9659
-323.00	0.6642	-21.48	0.9708
-303.00	0.6910		
-192.00	0.8263		
-160.00	0.8579		
Murakami, S. - Benson, G.C., An isothermal dilution calorimeter for measuring enthalpies of mixing, The Journal of Chemical Thermodynamics. 1 (1969) 559-572. doi:10.1016/0021-9614(69)90016-0		Becker, F. - Kiefer, M. - Koukol, H., Kontinuierliche Bestimmung von Mischungswärmen durch quasi-isotherme Wärmeflußkalorimetrie, Z. Phys. Chem. NF. 80 (1972) 29-43.	
T / K =	298.15	T / K =	298.15
P / bar =	UNKNOWN (1.0132)	P / bar =	UNKNOWN (1.0132)
$h^M / \text{J.mol}^{-1}$	x_1	$h^M / \text{J.mol}^{-1}$	x_1
-25.37	0.0279	-21.81	0.0250
-57.40	0.0641	-43.59	0.0500
-92.53	0.1058	-65.02	0.0750
-123.95	0.1480	-85.75	0.1000
-158.76	0.2001	-105.55	0.1250
-189.81	0.2552	-124.26	0.1500
-214.16	0.3088	-141.93	0.1750
-230.24	0.3536	-158.39	0.2000
-230.02	0.3540	-173.71	0.2250
-235.26	0.3702	-187.86	0.2500
-236.97	0.3773	-200.84	0.2750
-242.56	0.4027	-212.69	0.3000
-243.63	0.4072	-223.24	0.3250
-243.58	0.4098	-232.45	0.3500
-247.85	0.4385	-240.07	0.3750
-248.71	0.4428	-246.02	0.4000
-250.86	0.4774	-250.08	0.4250
-250.81	0.4869	-252.42	0.4500
-250.26	0.4902	-253.51	0.4750
-249.58	0.5190	-252.67	0.5000
-248.07	0.5314	-251.17	0.5250
-243.57	0.5654	-248.24	0.5500
-241.64	0.5739	-243.84	0.5750
-231.74	0.6159	-238.02	0.6000
-229.10	0.6227	-230.73	0.6250
-213.26	0.6691	-222.07	0.6500
-205.46	0.6853	-212.15	0.6750
-188.11	0.7238	-200.88	0.7000
-182.17	0.7331	-188.53	0.7250
-155.94	0.7810	-175.13	0.7500
		-160.69	0.7750
		-145.32	0.8000
		-129.08	0.8250

-112.08	0.8500
-94.37	0.8750
-76.03	0.9000
-57.23	0.9250
-38.18	0.9500
-19.01	0.9750

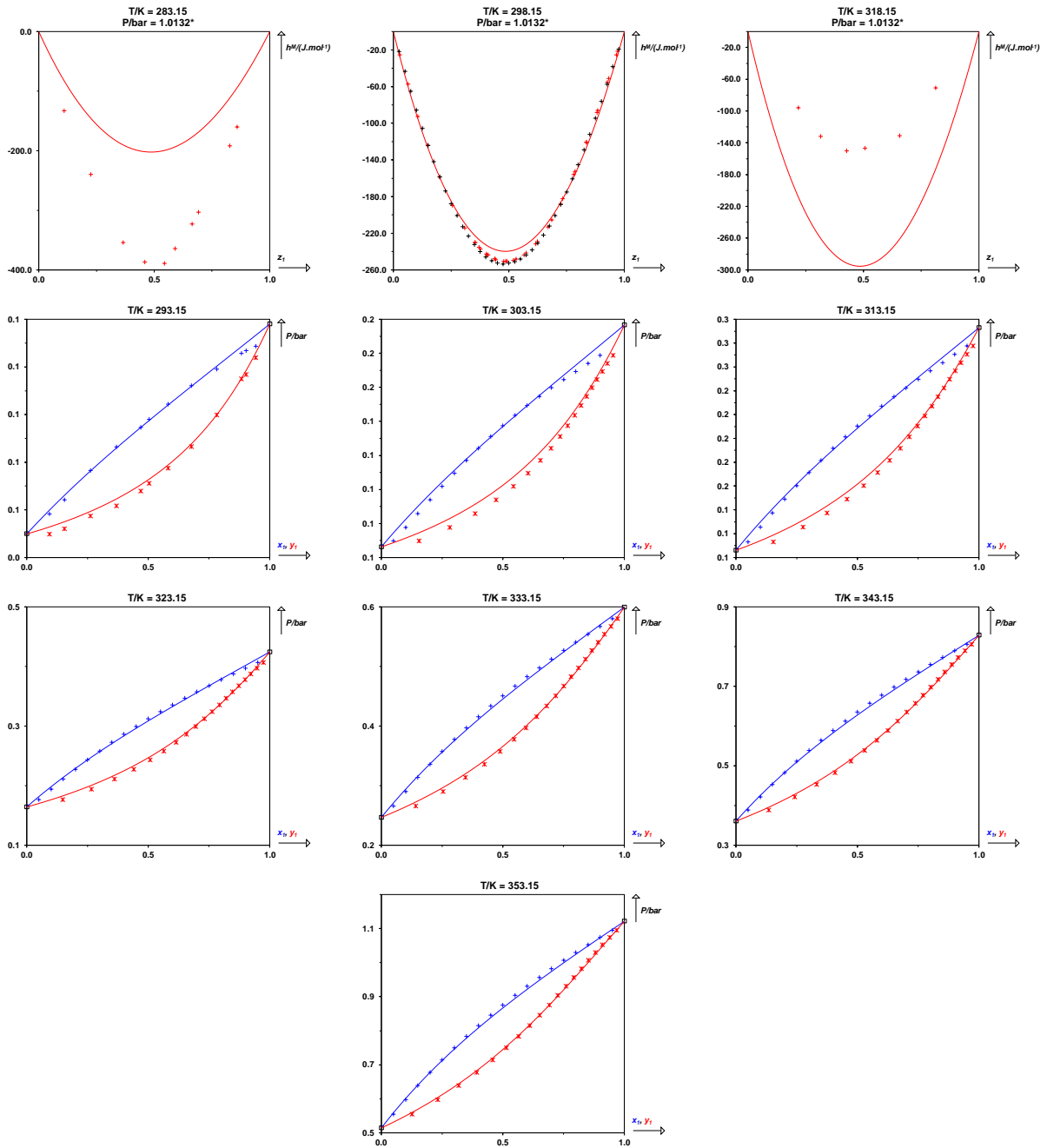
McKinnon, Ir - Williamson, Ag, Heats of mixing of CCl₄ with dioxane, Australian Journal of Chemistry. 17 (1964)
doi:10.1071/CH9641374

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
-96.00	0.2180
-132.00	0.3140
-150.00	0.4270
-147.00	0.5070
-131.00	0.6560
-71.00	0.8120

HA-NA systems (BAC = 2)



ETHYL ACETATE (1) + TOLUENE (2)

CAS	141-78-6	108-88-3
InChiKey	XEKOWRVHYACXOJ-UHFFFAOYSA-N	YXFVVABEGXRONW-UHFFFAOYSA-N
T_c / K	523.30	591.75
P_c / bar	38.80	41.08
ω	0.366	0.264

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 7.405$

$B/\text{MPa} = 7.752$

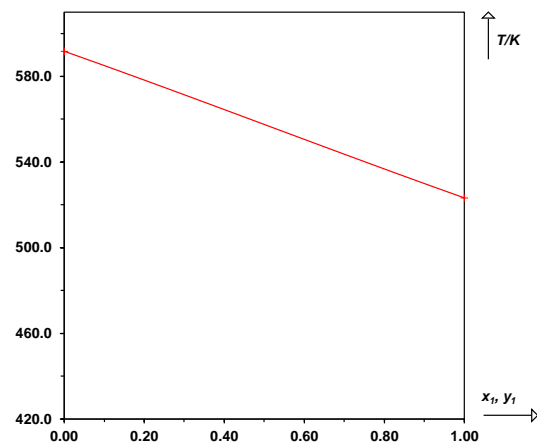
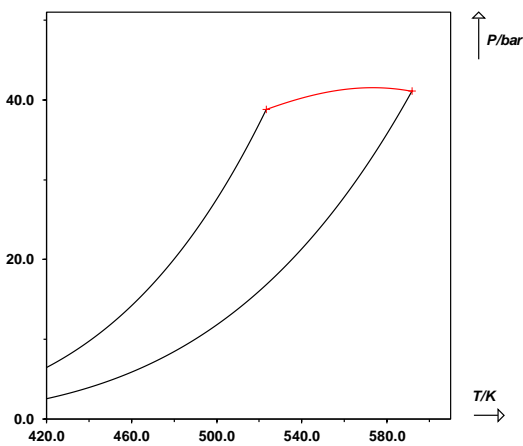
Deviations

MAPE on $x = 8.5\%$

MAPE on $y = 6.0\%$

MAPE on $h^M = 12\%$

MAPE on $c_p^M = 151\%$

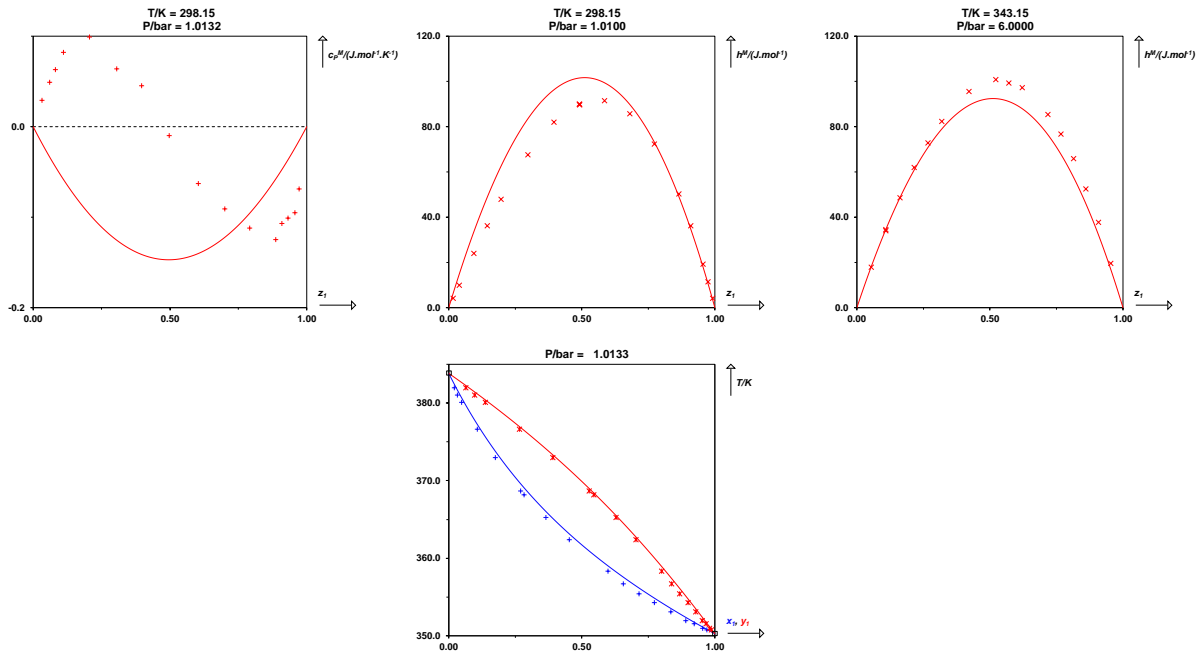


-----			91.50	0.5852
Isobaric phase equilibrium data			85.70	0.6798
-----			72.30	0.7723
Carr, A. D. - Kropholler, H. W., Vapor Liquid Equilibria at Atmospheric Pressure. Binary Systems of Ethyl Acetate-Benzene, Ethyl Acetate-Toluene, and Ethyl Acetate-p-Xylene, Journal of Chemical & Engineering Data. 7 (1962) 26-28. doi:10.1021/je60012a007			50.30	0.8641
P / bar = 1.013			36.10	0.9093
T / K	x ₁	y ₁	19.20	0.9550
381.97	0.0210	0.0640	11.50	0.9737
381.02	0.0320	0.0970	4.100	0.9911
380.09	0.0480	0.1370	Gmehling, J. - Meents, B., Excess enthalpy. Ethyl ethanoate-toluene system, Int. Data Ser. Sel. Data Mixtures Ser. A. (1992)	
376.61	0.1070	0.2650	T / K = 343.15	
372.95	0.1750	0.3910	P / bar = 6.000	
368.66	0.2700	0.5280	h ^M / J.mol ⁻¹	z ₁
368.17	0.2830	0.5450	17.79	0.0543
365.24	0.3650	0.6290	33.97	0.1082
362.37	0.4520	0.7030	34.41	0.1082
358.31	0.5980	0.8000	48.48	0.1615
356.70	0.6560	0.8370	61.90	0.2144
355.40	0.7150	0.8670	72.81	0.2668
354.29	0.7730	0.8990	82.37	0.3187
353.06	0.8350	0.9280	95.46	0.4212
351.95	0.8910	0.9530	100.80	0.5218
351.54	0.9220	0.9670	99.21	0.5715
350.96	0.9540	0.9800	97.24	0.6208
350.75	0.9700	0.9870	85.45	0.7180
-----			76.65	0.7660
Enthalpy of mixing			65.89	0.8136
-----			52.40	0.8608
Delcros, S. - Jiménez, E. - Romani, L. - Roux, A.H. - Grolier, J.-P.E. - Kehiaian, H.V., Linear alkanoates + aromatic hydrocarbon binary mixtures: new excess enthalpy measurements and DISQUAC analysis of thermodynamic properties, Fluid Phase Equilibria. 111 (1995) 71-88. doi:10.1016/0378-3812(95)02838-6			37.74	0.9076
T / K = 298.15			19.51	0.9540
P / bar = 1.010			-----	
h ^M / J.mol ⁻¹	z ₁		Heat capacity of mixing	
4.200	0.0162		-----	
9.900	0.0388		Jiménez, E, Excess heat capacities and excess volumes of (an n-alkylalkanoate + heptane or decane or toluene), The Journal of Chemical Thermodynamics. 26 (1994) 817-827. doi:10.1006/jcht.1994.1098	
23.90	0.0940		T / K = 298.15	
36.10	0.1446		P / bar = UNKNOWN (1.0132)	
47.90	0.1966		cp ^M / J.mol ⁻¹ .K ⁻¹	x ₁
67.60	0.2969		0.0290	0.0313
81.90	0.3957		0.0490	0.0593
89.90	0.4900		0.0630	0.0804
90.00	0.4919		0.0820	0.1109
89.60	0.4919		0.0990	0.2056
			0.0640	0.3049
			0.0450	0.3964

HA-NA systems (BAC = 2)

-0.0100	0.4975
-0.0630	0.6037
-0.0910	0.7006
-0.1120	0.7913
-0.1250	0.8860
-0.1070	0.9092
-0.1010	0.9310
-0.0950	0.9570
-0.0690	0.9717

HA-NA systems (BAC = 2)



BENZENE (1) + N-METHYL-2-PYRROLIDONE (2)

CAS	71-43-2	872-50-4
InChiKey	UHOVQNZJYSORNB-UHFFFAOYSA-N	SECXISVLQFMRJM-UHFFFAOYSA-N
T_c / K	562.05	721.60
P_c / bar	48.95	45.20
ω	0.210	0.373

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = -11.17

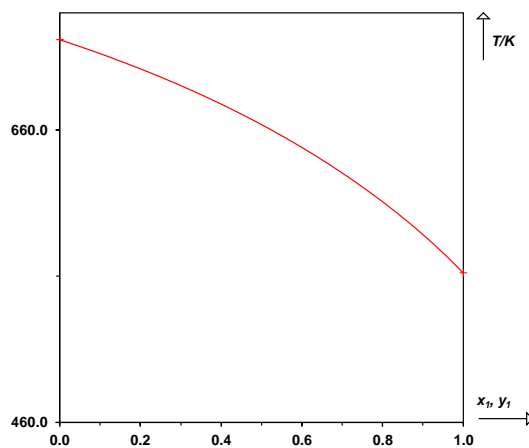
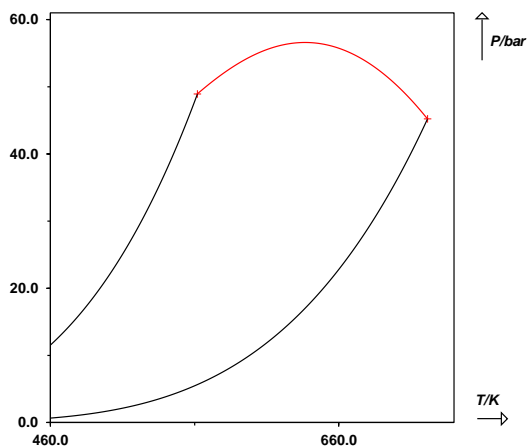
B/MPa = -39.89

Deviations

MAPE on x = 9.2 %

MAPE on y = 13 %

MAPE on h^M = 10 %



Isothermal phase equilibrium data

Linek, Jan - Wichterle, Ivan - Marsh, Kenneth N., Vapor-Liquid Equilibria for N-Methyl-2-pyrrolidone + Benzene, +Toluene, +Heptane, and +Methylcyclohexane, Journal of Chemical & Engineering Data. 41 (1996) 1212-1218. doi:10.1021/je9601826

T / K = 330.00		
P / bar	x ₁	y ₁
0.0220	0.0378	0.8043
0.0255	0.0455	0.8420
0.0321	0.0615	0.8709
0.0343	0.0654	0.8804
0.0902	0.1792	0.9605
0.1480	0.2925	0.9778
0.2764	0.5407	0.9870
0.2944	0.5807	0.9890
0.3148	0.6265	0.9900
0.3370	0.6830	0.9890
0.3506	0.7190	0.9870
0.3548	0.7260	0.9915
0.4308	0.9135	0.9970
0.4463	0.9520	0.9940
0.4586	0.9850	0.9990

Linek, Jan - Wichterle, Ivan - Marsh, Kenneth N., Vapor-Liquid Equilibria for N-Methyl-2-pyrrolidone + Benzene, +Toluene, +Heptane, and +Methylcyclohexane, Journal of Chemical & Engineering Data. 41 (1996) 1212-1218. doi:10.1021/je9601826

T / K = 350.00		
P / bar	x ₁	y ₁
0.0456	0.0378	0.7335
0.0531	0.0455	0.7680
0.0709	0.0654	0.8303
0.1639	0.1792	0.9381
0.2825	0.2925	0.9647
0.4226	0.4284	0.9830
0.5965	0.6020	0.9880
0.6299	0.6370	0.9885
0.6698	0.6870	0.9890
0.7533	0.7945	0.9940
0.8066	0.8655	0.9960
0.8453	0.9085	0.9975
0.8759	0.9540	0.9999
0.9019	0.9825	0.9999

Isobaric phase equilibrium data

Blanco, Beatriz - Beltrán, Sagrario - Cabezas, José Luis - Coca, José, Phase Equilibria of Binary Systems Formed by Hydrocarbons from Petroleum Fractions and the Solvents N-Methylpyrrolidone and N,N-Dimethylformamide. 1. Isobaric Vapor - Liquid Equilibria, Journal of Chemical & Engineering Data. 42 (1997) 938-942. doi:10.1021/je970059u

P / bar = 1.013		
T / K	x ₁	y ₁
448.45	0.0520	0.5300
437.85	0.0850	0.6740
426.20	0.1180	0.7900
406.65	0.2050	0.9010
398.65	0.2500	0.9310
381.60	0.4070	0.9710
378.50	0.4550	0.9770
370.40	0.5700	0.9860
365.30	0.6730	0.9920
363.45	0.7070	0.9930
360.55	0.7750	0.9950
357.30	0.8700	0.9980
355.30	0.9330	0.9990

Gupta, S.K. - Rawat, B.S. - Goswami, A.N. - Nanoti, S.M. - Krishna, R., Isobaric vapour—liquid equilibria of the systems: Benzene—triethylene glycol, toluene—triethylene glycol and benzene—N-methylpyrrolidone, Fluid Phase Equilibria. 46 (1989) 95-102. doi:10.1016/0378-3812(89)80278-X

P / bar = 1.013		
T / K	x ₁	y ₁
420.05	0.1217	0.8242
413.35	0.1514	0.8650
397.75	0.2360	0.9280
383.15	0.3660	0.9658
377.05	0.4550	0.9760
371.45	0.5493	0.9840
365.75	0.6634	0.9902
361.95	0.7471	0.9935
358.85	0.8335	0.9961
355.85	0.9173	0.9982

Enthalpy of mixing

Letcher, T.M. - Naicker, P.K., Excess molar enthalpies and excess molar volumes of mixtures containing N-methyl-2-pyrrolidone and an aromatic hydrocarbon at T= 298.15 K and p= 0.101325 MPa, The Journal of Chemical Thermodynamics. 31 (1999) 1585-1595. doi:10.1006/jcht.1999.0555

T / K = 298.15

P / bar =	1.010	-452.18	0.4197
$h^M / \text{J.mol}^{-1}$	z_1	-469.33	0.5204
-237.20	0.1560	-442.84	0.6194
-358.60	0.2390	-374.02	0.7169
-443.00	0.3070	-267.65	0.8127
-471.40	0.3420	-198.96	0.8601
-540.10	0.4860	-130.23	0.9071
-546.40	0.5160	-94.79	0.9305
-544.10	0.5310		
-540.50	0.5480		
-533.00	0.5850		
-469.00	0.6880		
-387.10	0.7770		
-365.10	0.7900		

Chhikara, Yameeka - Yadav, J.S. - Sharma, Dimple - Sharma, V.K., Thermodynamic and topological investigations of molecular interactions in binary and ternary mixtures containing 1-methyl pyrrolidin-2-one at T=308.15K, The Journal of Chemical Thermodynamics. 43 (2011) 737-749. doi:10.1016/j.jct.2010.12.016

T / K = 308.15
P / bar = UNKNOWN (1.0132)

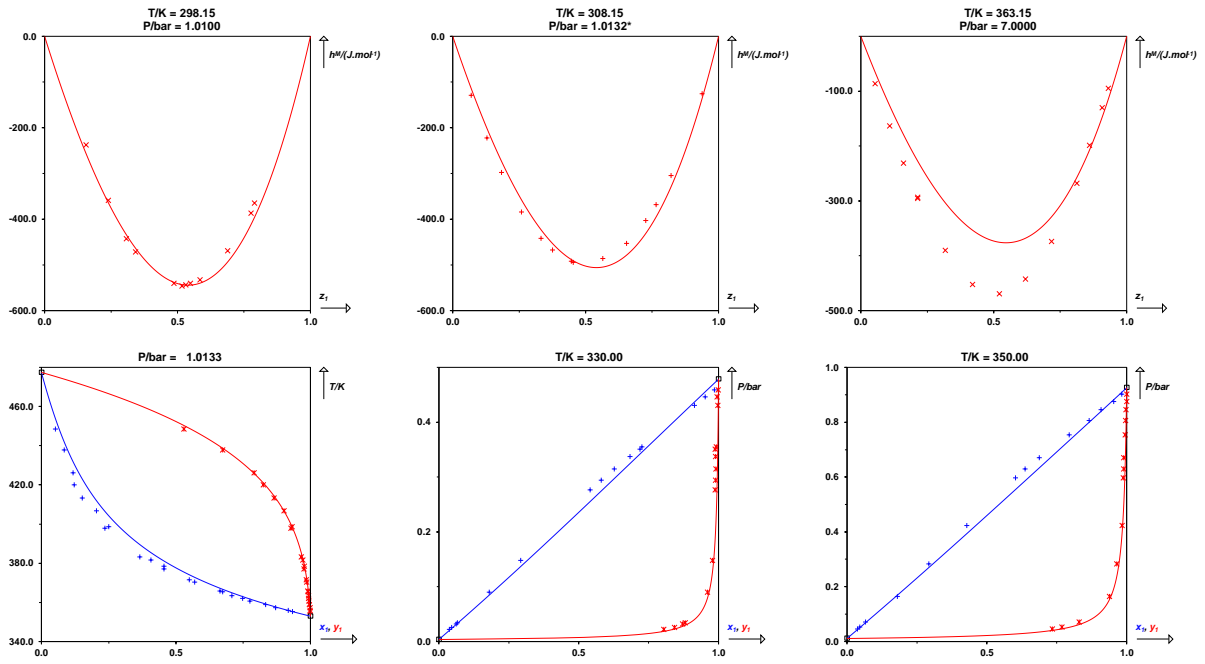
$h^M / \text{J.mol}^{-1}$	x_1
-125.90	0.9375
-304.40	0.8212
-368.40	0.7644
-402.90	0.7264
-452.60	0.6538
-485.80	0.5638
-494.30	0.4533
-492.30	0.4459
-467.20	0.3757
-442.10	0.3319
-384.10	0.2589
-298.20	0.1837
-222.60	0.1281
-129.30	0.0689

Gmehling, J. - Meents, B., Excess enthalpy. 1-Methyl-2-pyrrolidinone - benzene system, Int. Data Ser. Sel. Data Mixtures Ser. A. (1992)

T / K = 363.15
P / bar = 7.000

$h^M / \text{J.mol}^{-1}$	z_1
-86.27	0.0540
-163.48	0.1076
-231.14	0.1607
-295.81	0.2134
-293.42	0.2134
-390.52	0.3174

HA-NA systems (BAC = 2)



1,2,3,4-TETRAHYDRONAPHTHALENE (1) + QUINOLINE (2)

CAS	119-64-2	91-22-5
InChiKey	CXWXQJXEFPUFDZ-UHFFFAOYSA-N	SMWDFEZZVXVKRB-UHFFFAOYSA-N
T_c / K	720.00	782.15
P_c / bar	36.50	48.60
ω	0.335	0.346

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

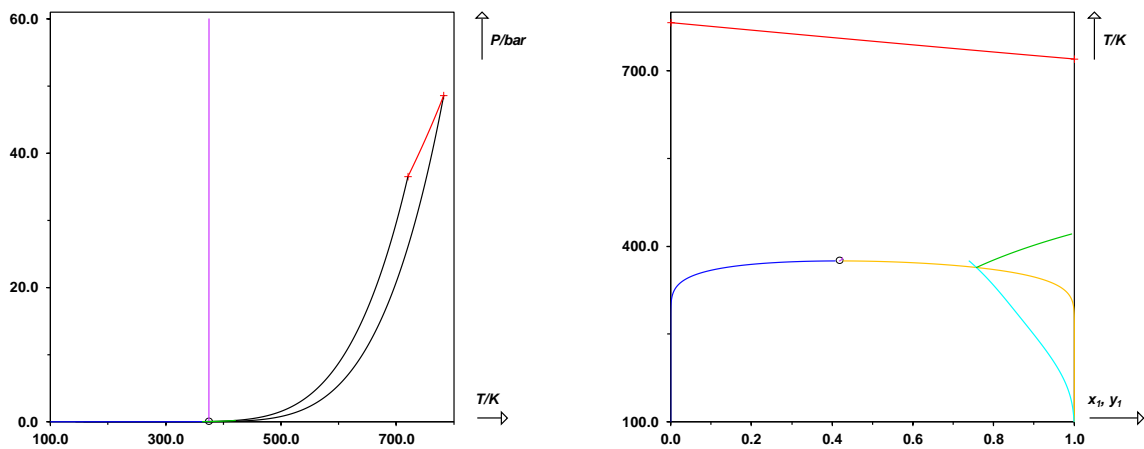
A/MPa = 253.1

B/MPa = 1323

Deviations

MAPE on x = 6.2 %

MAPE on y = 5.5 %



Isothermal phase equilibrium data

Niesen, Vicki G. - Yesavage, Victor F., Vapor-liquid equilibria for m-cresol/tetralin and tetralin/quinoline at temperatures between 523 and 598 K, Journal of Chemical & Engineering Data. 33 (1988) 253-258. doi:10.1021/je00053a009

T / K = 523.15

P / bar	x ₁	y ₁
1.407	0.0410	0.0870
1.510	0.1020	0.1880
1.613	0.1800	0.3040
2.235	0.6910	0.7850
2.356	0.8260	0.8790
2.388	0.8880	0.9240

Niesen, Vicki G. - Yesavage, Victor F., Vapor-liquid equilibria for m-cresol/tetralin and tetralin/quinoline at temperatures between 523 and 598 K, Journal of Chemical & Engineering Data. 33 (1988) 253-258. doi:10.1021/je00053a009

T / K = 548.15

P / bar	x ₁	y ₁
2.296	0.0360	0.0740
2.434	0.0990	0.1770
2.647	0.1870	0.3040
2.860	0.3050	0.4420
3.138	0.4470	0.5800
3.372	0.5830	0.6920
3.534	0.6890	0.7790
3.697	0.8170	0.8720
3.798	0.9050	0.9320

Niesen, Vicki G. - Yesavage, Victor F., Vapor-liquid equilibria for m-cresol/tetralin and tetralin/quinoline at temperatures between 523 and 598 K, Journal of Chemical & Engineering Data. 33 (1988) 253-258. doi:10.1021/je00053a009

T / K = 573.15

P / bar	x ₁	y ₁
3.554	0.0320	0.0560
3.731	0.0790	0.1370
3.939	0.1460	0.2360
4.167	0.2200	0.3310
4.479	0.3320	0.4540
4.747	0.4370	0.5460
5.017	0.5510	0.6620
5.226	0.6540	0.7410
5.444	0.7600	0.8210
5.715	0.9130	0.9360

Niesen, Vicki G. - Yesavage, Victor F., Vapor-liquid equilibria for m-cresol/tetralin and tetralin/quinoline at temperatures between 523 and 598 K, Journal of Chemical & Engineering Data. 33 (1988) 253-258. doi:10.1021/je00053a009

T / K = 598.15

P / bar	x ₁	y ₁
5.534	0.0750	0.1230
5.842	0.1430	0.2240
6.163	0.2220	0.3190
6.568	0.3280	0.4420
6.918	0.4300	0.5390
7.235	0.5370	0.6330
7.626	0.6560	0.7330
7.898	0.7590	0.8150
8.266	0.9160	0.9360

Mahmood, Shaukat - Zhao, Qingwen - Kabadi, Vinayak N., High-Temperature VLE for the Tetralin-Quinoline System, Journal of Chemical & Engineering Data. 46 (2001) 994-999. doi:10.1021/je000069m

T / K = 623.15

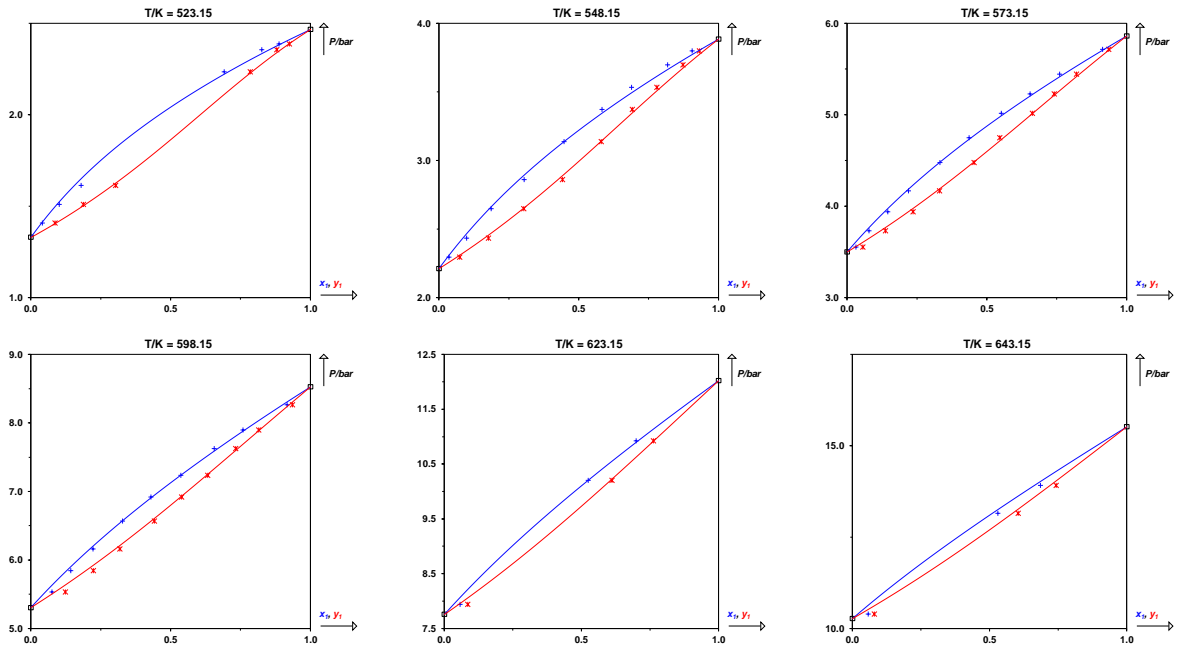
P / bar	x ₁	y ₁
7.940	0.0570	0.0860
10.20	0.5250	0.6110
10.92	0.7000	0.7630

Mahmood, Shaukat - Zhao, Qingwen - Kabadi, Vinayak N., High-Temperature VLE for the Tetralin-Quinoline System, Journal of Chemical & Engineering Data. 46 (2001) 994-999. doi:10.1021/je000069m

T / K = 643.15

P / bar	x ₁	y ₁
10.40	0.0570	0.0800
13.15	0.5300	0.6050
13.92	0.6850	0.7430

HA-NA systems (BAC = 2)



DIFLUOROMETHANE (1) + PROPANE (2)

CAS	75-10-5	74-98-6
InChiKey	RWRIWBAlICGTTQ-UHFFFAOYSA-N	ATUOYWbHWKTHZ-UHFFFAOYSA-N
T_c / K	351.26	369.83
P_c / bar	57.84	42.48
ω	0.277	0.152

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 171.7$

$B/\text{MPa} = 230.5$

Deviations

MAPE on $x = 8.3\%$

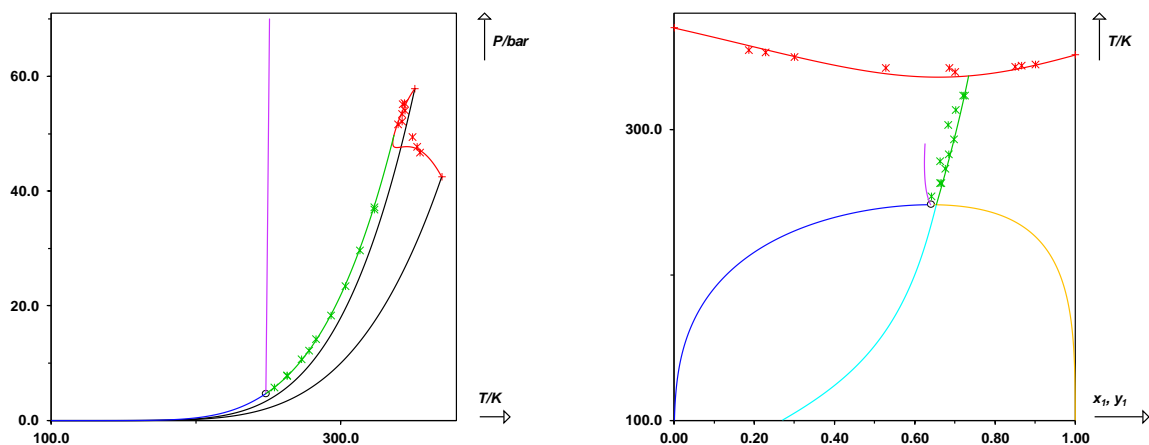
MAPE on $y = 4.3\%$

MAPE on $x_c = 18\%$

MAPE on $P_c = 3.0\%$

MAPE on $x_{az} = 2.0\%$

MAPE on $P_{az} = 0.75\%$



-----				4.343	0.0360	0.2040	
Isothermal phase equilibrium data				5.382	0.0890	0.3650	
-----				6.558	0.1740	0.5030	
Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R., VLE measurements and modeling for the strongly positive azeotropic R32+propane system, Fluid Phase Equilibria. 199 (2002) 175-183. doi:10.1016/S0378-3812(01)00798-1				7.012	0.2230	0.5490	
T / K = 248.13				7.322	0.2930	0.5870	
P / bar	x ₁	y ₁		7.538	0.3690	0.6150	
4.130	0.1577	0.5375		7.663	0.4530	0.6380	
4.628	0.4204	0.6158		7.748	0.5540	0.6520	
4.658	0.5850	0.6301		7.776	0.6590	0.6620	
4.659	0.5892	0.6308		7.776	0.6635	0.6635	AZEO
4.659	0.6707	0.6386		7.870	0.6660	0.6660	AZEO
4.661	0.6732	0.6394		7.746	0.7320	0.6750	
4.659	0.6911	0.6430		7.729	0.7880	0.6800	
4.657	0.7061	0.6437		7.516	0.8670	0.7170	
4.536	0.8510	0.6866		7.303	0.9100	0.7570	
4.248	0.9248	0.7583		Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1			
Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R., VLE measurements and modeling for the strongly positive azeotropic R32+propane system, Fluid Phase Equilibria. 199 (2002) 175-183. doi:10.1016/S0378-3812(01)00798-1				T / K = 273.15			
T / K = 254.15				P / bar	x ₁	y ₁	
P / bar	x ₁	y ₁		5.946	0.0370	0.1850	
3.432	0.0377	0.2676		7.086	0.0840	0.3350	
3.908	0.0589	0.3594		8.154	0.1420	0.4460	
4.486	0.0993	0.4522		9.317	0.2330	0.5290	
5.015	0.1589	0.5227		9.775	0.3040	0.5770	
5.393	0.2358	0.5705		10.13	0.3700	0.6050	
5.527	0.2872	0.5872		10.34	0.4420	0.6270	
5.648	0.3763	0.6064		10.50	0.5430	0.6520	
5.743	0.5354	0.6287		10.54	0.5840	0.6590	
5.751	0.5668	0.6329		10.55	0.6420	0.6670	
5.752	0.6407	0.6410		10.67	0.6760	0.6760	AZEO
5.750	0.6416	0.6416	AZEO	10.52	0.7200	0.6810	
5.746	0.7184	0.6539		10.48	0.7780	0.7020	
5.735	0.7485	0.6602		10.21	0.8650	0.7380	
5.556	0.8616	0.7084		9.906	0.9100	0.7860	
5.434	0.8921	0.7348		Coquelet, Christophe - Chareton, Albert - Valtz, Alain - Baba-Ahmed, Abdelatif - Richon, Dominique, Vapor-Liquid Equilibrium Data for the Azeotropic Difluoromethane + Propane System at Temperatures from 294.83 to 343.26 K and Pressures up to 5.4 MPa, Journal of Chemical & Engineering Data. 48 (2003) 317-323. doi:10.1021/je020115d			
4.934	0.9562	0.8394		T / K = 278.10			
Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1				P / bar	x ₁	y ₁	
T / K = 263.15				7.270	0.0430	0.2360	
P / bar	x ₁	y ₁		9.360	0.1240	0.4190	
				11.09	0.2620	0.5260	

HD-NA systems (BAC = 3)

11.89	0.4240	0.5960		18.24	0.6410	0.6750	
12.01	0.4740	0.6100		18.33	0.6980	0.6980	AZEO
12.09	0.5160	0.6220		18.22	0.7290	0.7140	
12.15	0.5630	0.6340		17.59	0.8630	0.7850	
12.18	0.5830	0.6390		17.09	0.9080	0.8300	
12.20	0.6080	0.6460					
12.21	0.6280	0.6510					
12.21	0.6630	0.6630	AZEO				
12.22	0.6730	0.6640					
12.21	0.6800	0.6660					
12.14	0.7560	0.6930					
12.05	0.7910	0.7110					
11.31	0.9090	0.8050					
10.23	0.9750	0.9210					
Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1				Coquelet, Christophe - Chareton, Albert - Valtz, Alain - Baba-Ahmed, Abdelatif - Richon, Dominique, Vapor-Liquid Equilibrium Data for the Azeotropic Difluoromethane + Propane System at Temperatures from 294.83 to 343.26 K and Pressures up to 5.4 MPa, Journal of Chemical & Engineering Data. 48 (2003) 317-323. doi:10.1021/je020115d			
T / K = 283.15				T / K = 303.23			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
7.695	0.0350	0.1680		12.55	0.0270	0.1260	
8.164	0.0500	0.2160		14.92	0.0730	0.2580	
9.214	0.0840	0.3090		18.24	0.1650	0.4040	
10.12	0.1150	0.3740		20.76	0.2870	0.5030	
11.65	0.1940	0.4750		22.62	0.4560	0.5900	
12.71	0.3020	0.5560		23.11	0.5350	0.6150	
13.34	0.4000	0.6040		23.17	0.5640	0.6300	
13.61	0.4590	0.6220		23.36	0.6460	0.6650	
13.96	0.5700	0.6540		23.42	0.6830	0.6830	AZEO
14.02	0.6540	0.6750		23.40	0.6940	0.6890	
14.22	0.6850	0.6850	AZEO	23.45	0.7050	0.6950	
13.99	0.7240	0.6980		23.18	0.7940	0.7470	
13.52	0.8650	0.7560		22.26	0.8900	0.8240	
13.15	0.9100	0.8030		20.94	0.9530	0.9160	
Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1				Coquelet, Christophe - Chareton, Albert - Valtz, Alain - Baba-Ahmed, Abdelatif - Richon, Dominique, Vapor-Liquid Equilibrium Data for the Azeotropic Difluoromethane + Propane System at Temperatures from 294.83 to 343.26 K and Pressures up to 5.4 MPa, Journal of Chemical & Engineering Data. 48 (2003) 317-323. doi:10.1021/je020115d			
T / K = 293.15				T / K = 313.26			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
10.67	0.0650	0.2320		14.96	0.0170	0.0750	
12.27	0.1130	0.3360		16.08	0.0340	0.1330	
14.33	0.1860	0.4390		23.44	0.1980	0.4120	
16.20	0.3020	0.5320		25.40	0.2720	0.4750	
17.32	0.4010	0.5880		27.20	0.3670	0.5300	
17.62	0.4470	0.6080		28.44	0.4680	0.5830	
18.10	0.5650	0.6510		29.31	0.5820	0.6390	
				29.40	0.6050	0.6490	
				29.52	0.6220	0.6580	
				29.61	0.7020	0.7020	AZEO
				29.64	0.7100	0.7050	
				29.23	0.7990	0.7610	
				28.80	0.8440	0.7970	

26.85 0.9470 0.9010

Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1

T / K = 323.15

P / bar	x_1	y_1	
19.47	0.0390	0.1120	
22.12	0.0930	0.2270	
26.21	0.1670	0.3440	
28.86	0.2280	0.4010	
32.43	0.3420	0.4870	
34.30	0.4350	0.5480	
35.69	0.5190	0.5950	
36.59	0.6310	0.6630	
36.74	0.7200	0.7200	AZEO
37.21	0.7250	0.7250	AZEO
36.59	0.7790	0.7630	
35.55	0.8690	0.8310	
34.83	0.9020	0.8660	

Coquelet, Christophe - Chareton, Albert - Valtz, Alain - Baba-Ahmed, Abdelatif - Richon, Dominique, Vapor-Liquid Equilibrium Data for the Azeotropic Difluoromethane + Propane System at Temperatures from 294.83 to 343.26 K and Pressures up to 5.4 MPa, Journal of Chemical & Engineering Data. 48 (2003) 317-323. doi:10.1021/je020115d

T / K = 343.26

P / bar	x_1	y_1
31.39	0.0650	0.1460
34.99	0.1130	0.2260
39.64	0.1880	0.3100
42.22	0.2370	0.3450
44.42	0.2820	0.3750
47.02	0.3450	0.4200
50.09	0.4320	0.4720
50.77	0.4570	0.4800
54.51	0.8580	0.8490
54.13	0.8760	0.8660
53.08	0.9110	0.9010
52.59	0.9240	0.9150
52.01	0.9390	0.9300
50.49	0.9720	0.9650
49.40	0.9920	0.9890

Critical point

Higashi, Yukihiro, Experimental determination of the critical locus for the difluoromethane (R32) and propane (R290) system, Fluid Phase Equilibria. 219 (2004) 99-103. doi:10.1016/j.fluid.2004.02.004

T / K	P / bar	x_1
339.63	51.59	0.7000
344.56	54.06	0.9000

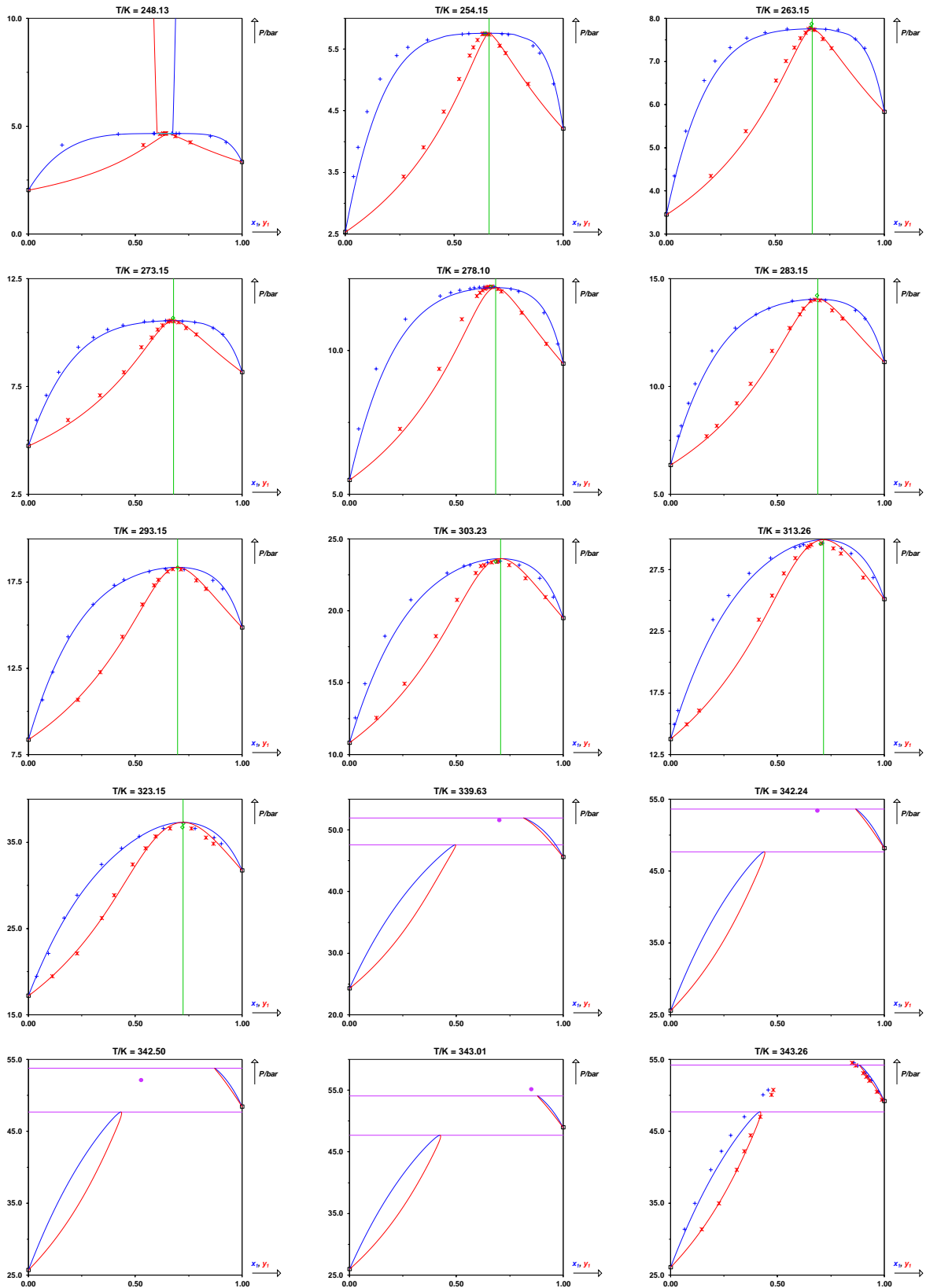
Van Poolen, Lambert J. - Holcomb, Cynthia D. - Rainwater, James C., Isoplethic Method to Estimate Critical Lines for Binary Fluid Mixtures from Subcritical Vapor-Liquid Equilibrium: Application to the Azeotropic Mixtures R32 + C3H8 and R125 + C3H8, Industrial & Engineering Chemistry Research. 40 (2001) 4610-4614. doi:10.1021/ie010215x

T / K	P / bar	x_1
342.24	53.40	0.6859
343.01	55.16	0.8500
349.80	49.43	0.3006
352.81	47.73	0.2275
354.78	46.68	0.1862

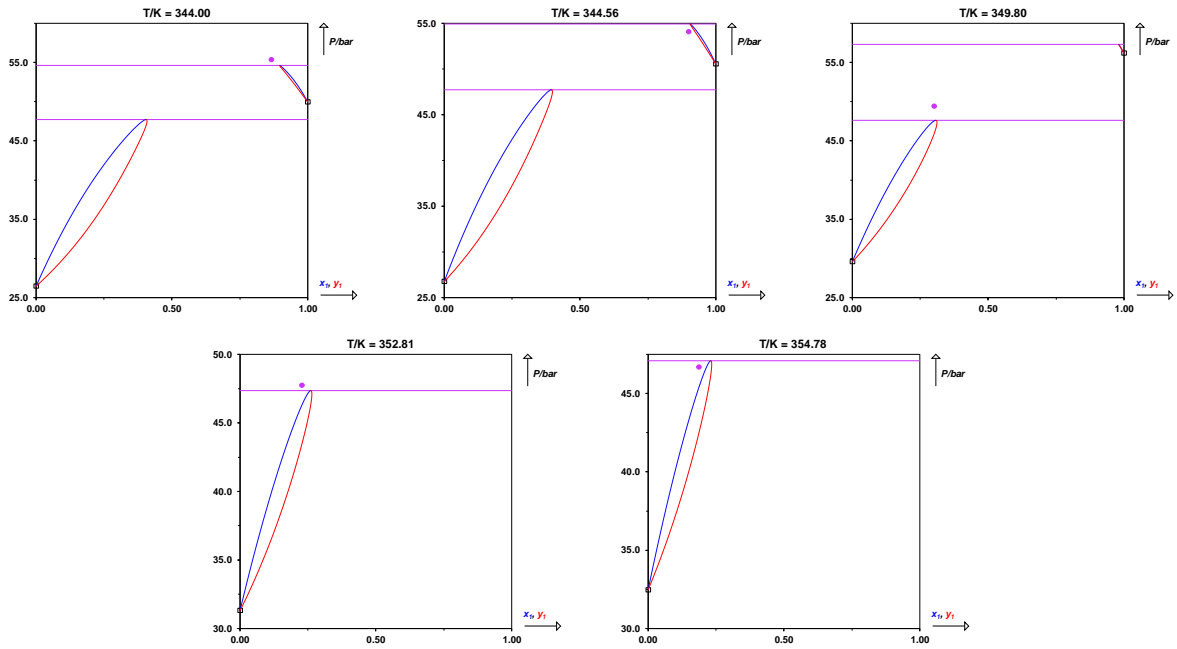
Coquelet, Christophe - Chareton, Albert - Valtz, Alain - Baba-Ahmed, Abdelatif - Richon, Dominique, Vapor-Liquid Equilibrium Data for the Azeotropic Difluoromethane + Propane System at Temperatures from 294.83 to 343.26 K and Pressures up to 5.4 MPa, Journal of Chemical & Engineering Data. 48 (2003) 317-323. doi:10.1021/je020115d

T / K	P / bar	x_1
342.50	52.10	0.5270
344.00	55.32	0.8660

HD-NA systems (BAC = 3)



HD-NA systems (BAC = 3)



TRIFLUOROMETHANE (1) + ETHANE (2)

CAS	75-46-7	74-84-0
InChiKey	XPDWGBQVDMORPB-UHFFFAOYSA-N	OTMSDBZUPAUEDD-UHFFFAOYSA-N
T_c / K	299.01	305.32
P_c / bar	48.16	48.72
ω	0.264	0.099

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 147.4$

$B/\text{MPa} = 216.3$

Deviations

MAPE on $x = 21\%$

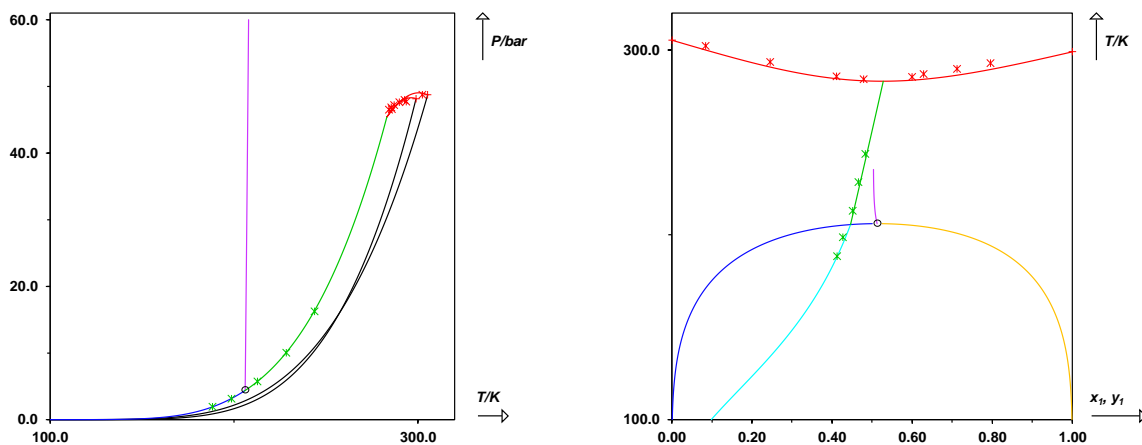
MAPE on $y = 2.8\%$

MAPE on $x_c = 39\%$

MAPE on $P_c = 0.71\%$

MAPE on $x_{az} = 0.80\%$

MAPE on $P_{az} = 0.65\%$



Isothermal phase equilibrium data

Zhang, Yu - Gong, Maoqiong - Zhu, Hongbo - Wu, Jianfeng, Vapor-Liquid Equilibrium Data for the Ethane + Trifluoromethane System at Temperatures from (188.31 to 243.76) K, Journal of Chemical & Engineering Data. 51 (2006) 1411-1414. doi:10.1021/je0601107

T / K = 188.31

P / bar	x ₁	y ₁	
1.798	0.8561	0.4660	
1.899	0.7226	0.4301	
1.914	0.6064	0.4205	
1.915	0.4977	0.4171	
1.908	0.4126	0.4126	AZEO
1.914	0.3779	0.4128	
1.892	0.2032	0.3931	

Zhang, Yu - Gong, Maoqiong - Zhu, Hongbo - Wu, Jianfeng, Vapor-Liquid Equilibrium Data for the Ethane + Trifluoromethane System at Temperatures from (188.31 to 243.76) K, Journal of Chemical & Engineering Data. 51 (2006) 1411-1414. doi:10.1021/je0601107

T / K = 198.66

P / bar	x ₁	y ₁	
2.735	0.9059	0.5532	
3.064	0.7283	0.4637	
3.121	0.6038	0.4437	
3.130	0.4937	0.4339	
3.134	0.4272	0.4272	AZEO
3.125	0.3758	0.4232	
3.053	0.2043	0.3872	

Zhang, Yu - Gong, Maoqiong - Zhu, Hongbo - Wu, Jianfeng, Vapor-Liquid Equilibrium Data for the Ethane + Trifluoromethane System at Temperatures from (188.31 to 243.76) K, Journal of Chemical & Engineering Data. 51 (2006) 1411-1414. doi:10.1021/je0601107

T / K = 212.84

P / bar	x ₁	y ₁	
4.691	0.9129	0.6474	
5.461	0.7532	0.5209	
5.644	0.6075	0.4833	
5.685	0.4886	0.4578	
5.689	0.4506	0.4506	AZEO
5.689	0.4495	0.4502	
5.687	0.4312	0.4449	
5.665	0.3880	0.4356	
5.446	0.1964	0.3726	

Zhang, Yu - Gong, Maoqiong - Zhu, Hongbo - Wu, Jianfeng, Vapor-Liquid Equilibrium Data for the Ethane +

Trifluoromethane System at Temperatures from (188.31 to 243.76) K, Journal of Chemical & Engineering Data. 51 (2006) 1411-1414. doi:10.1021/je0601107

T / K = 228.50

P / bar	x ₁	y ₁	
8.641	0.8792	0.6576	
9.688	0.7142	0.5470	
9.954	0.5742	0.4963	
10.00	0.4991	0.4749	
10.01	0.4753	0.4683	
10.03	0.4663	0.4663	AZEO
10.01	0.4615	0.4651	
9.984	0.3836	0.4414	
9.408	0.1834	0.3540	

Zhang, Yu - Gong, Maoqiong - Zhu, Hongbo - Wu, Jianfeng, Vapor-Liquid Equilibrium Data for the Ethane + Trifluoromethane System at Temperatures from (188.31 to 243.76) K, Journal of Chemical & Engineering Data. 51 (2006) 1411-1414. doi:10.1021/je0601107

T / K = 243.76

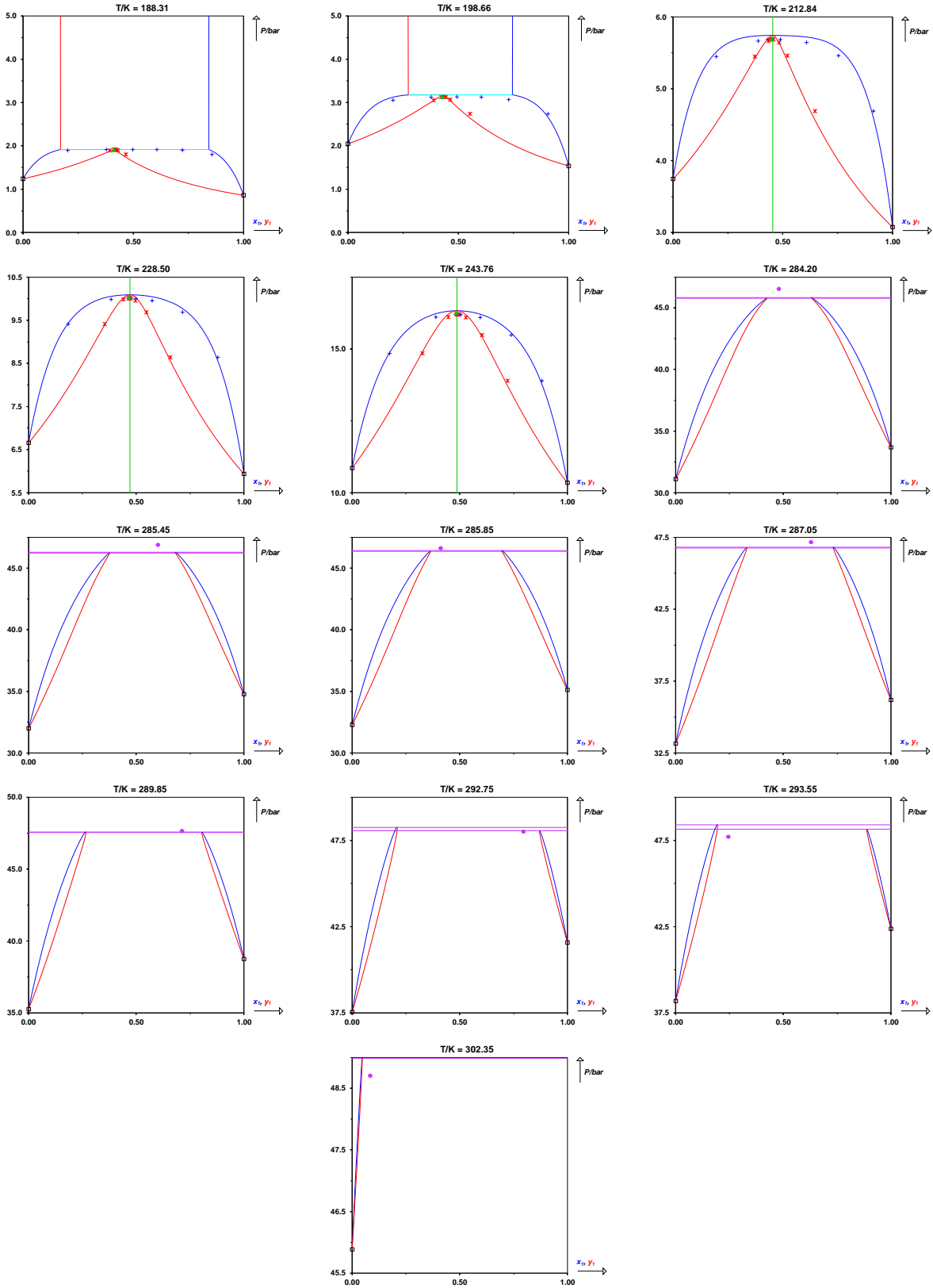
P / bar	x ₁	y ₁	
13.90	0.8818	0.7213	
15.48	0.7383	0.6029	
16.10	0.5951	0.5279	
16.19	0.5044	0.4957	
16.21	0.4931	0.4900	
16.26	0.4830	0.4830	AZEO
16.20	0.4805	0.4853	
16.10	0.3881	0.4463	
14.85	0.1745	0.3270	

Critical point

Kordikowski, Andreas - Poliakoff, Martyn, Acoustic probing of phase equilibria in near-critical fluids, Fluid Phase Equilibria. 150-151 (1998) 493-499. doi:10.1016/S0378-3812(98)00296-9

T / K	P / bar	x ₁
284.20	46.54	0.4790
285.45	46.88	0.6000
285.85	46.60	0.4110
287.05	47.16	0.6290
289.85	47.64	0.7120
292.75	48.00	0.7950
293.55	47.70	0.2450
302.35	48.70	0.0840

HD-NA systems (BAC = 3)



CARBON TETRAFLUORIDE (1) + TRIFLUOROMETHANE (2)

CAS	75-73-0	75-46-7
InChiKey	TXEYQDLBPFQVAA-UHFFFAOYSA-N	XPDWGBQVDMORPB-UHFFFAOYSA-N
T_c / K	227.51	299.01
P_c / bar	37.45	48.16
ω	0.179	0.264

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

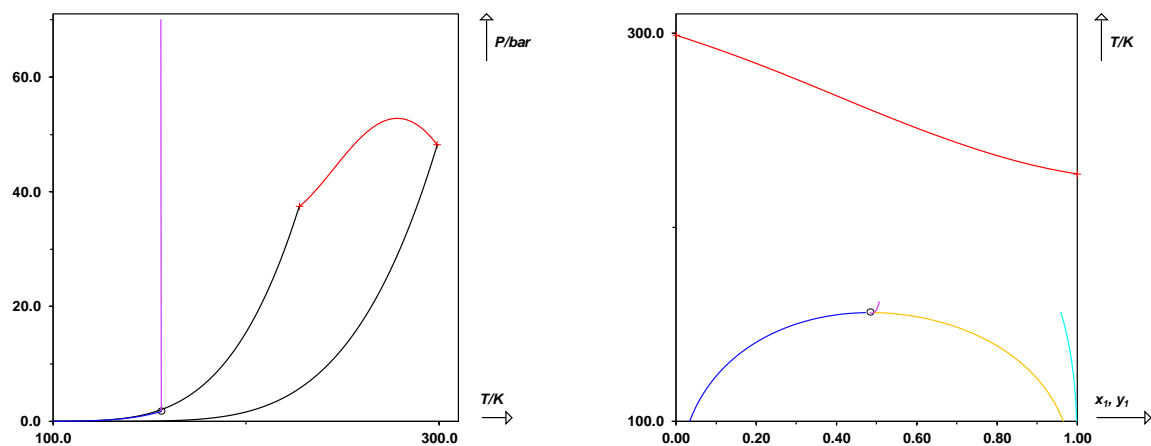
$A/\text{MPa} = 97.35$

$B/\text{MPa} = 120.0$

Deviations

MAPE on $x = 12\%$

MAPE on $y = 3.9\%$



Isothermal phase equilibrium data					
-----			2.031	0.0070	0.1860
Isothermal phase equilibrium data			2.217	0.0127	0.2629
-----			2.576	0.0203	0.3485
Kubic, William L. - Stein, Fred P., An experimental and correlative study of the vapor-liquid equilibria of the tetrafluoromethane-chlorotrifluoromethane system, Fluid Phase Equilibria. 5 (1981) 289-304. doi:10.1016/0378-3812(80)80062-8			3.235	0.0362	0.4786
T / K = 145.15			3.936	0.0557	0.5754
P / bar	x ₁	y ₁	5.127	0.0924	0.6759
0.2448	0.0273	0.8773	6.445	0.1350	0.7472
0.3978	0.0728	0.9287	8.729	0.2424	0.8209
0.5081	0.1016	0.9493	10.77	0.3956	0.8563
0.6419	0.1657	0.9579	11.82	0.5103	0.8772
0.7632	0.2560	0.9662	12.32	0.5721	0.8846
0.8322	0.3303	0.9722	12.31	0.5794	0.8843
0.8550	0.4066	0.9706	13.46	0.7462	0.9125
0.9211	0.6128	0.9743	14.06	0.8194	0.9287
0.9411	0.6466	0.9804	14.71	0.9068	0.9547
0.9680	0.8189	0.9834	14.76	0.9190	0.9548
0.9804	0.9808	0.9851	15.09	0.9484	0.9710
Kubic, William L. - Stein, Fred P., An experimental and correlative study of the vapor-liquid equilibria of the tetrafluoromethane-chlorotrifluoromethane system, Fluid Phase Equilibria. 5 (1981) 289-304. doi:10.1016/0378-3812(80)80062-8			Kubic, William L. - Stein, Fred P., An experimental and correlative study of the vapor-liquid equilibria of the tetrafluoromethane-chlorotrifluoromethane system, Fluid Phase Equilibria. 5 (1981) 289-304. doi:10.1016/0378-3812(80)80062-8		
T / K = 172.04			T / K = 224.82		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.7364	0.0200	0.5860	6.196	0.0140	0.1542
1.298	0.0519	0.7736	8.940	0.0562	0.4025
2.612	0.1557	0.8908	9.524	0.0674	0.4384
3.034	0.2154	0.9191	13.21	0.1356	0.5955
3.227	0.2397	0.9136	17.90	0.2508	0.7036
3.660	0.3492	0.9275	20.80	0.3461	0.7445
3.993	0.4822	0.9355	22.88	0.4354	0.7755
4.029	0.5054	0.9388	25.89	0.5613	0.8079
4.033	0.5078	0.9390	27.89	0.6729	0.8367
4.229	0.6282	0.9448	29.71	0.7593	0.8640
4.327	0.7241	0.9496	29.79	0.7612	0.8646
4.462	0.8024	0.9564	30.31	0.8026	0.8779
4.579	0.8705	0.9635	32.91	0.9128	0.9346
4.702	0.9267	0.9737	33.76	0.9664	0.9699
Kubic, William L. - Stein, Fred P., An experimental and correlative study of the vapor-liquid equilibria of the tetrafluoromethane-chlorotrifluoromethane system, Fluid Phase Equilibria. 5 (1981) 289-304. doi:10.1016/0378-3812(80)80062-8			Kubic, William L. - Stein, Fred P., An experimental and correlative study of the vapor-liquid equilibria of the tetrafluoromethane-chlorotrifluoromethane system, Fluid Phase Equilibria. 5 (1981) 289-304. doi:10.1016/0378-3812(80)80062-8		
T / K = 199.82			T / K = 255.37		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
1.846	0.0032	0.1056	19.53	0.0509	0.2006
			22.30	0.0741	0.2851
			25.48	0.1130	0.3634
			29.06	0.1571	0.4293

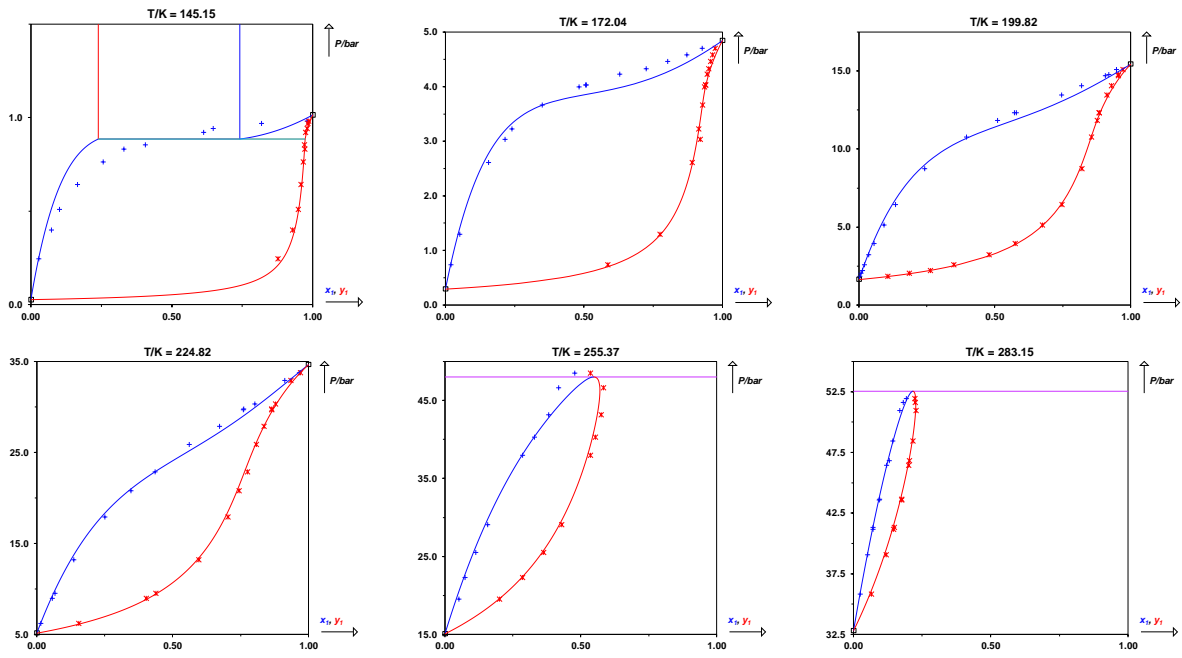
37.99	0.2850	0.5353
40.29	0.3294	0.5545
43.16	0.3821	0.5744
46.64	0.4189	0.5829
48.52	0.4773	0.5356

Kubic, William L. - Stein, Fred P., An experimental and correlative study of the vapor-liquid equilibria of the tetrafluoromethane-chlorotrifluoromethane system, Fluid Phase Equilibria. 5 (1981) 289-304. doi:10.1016/0378-3812(80)80062-8

T / K = 283.15

P / bar	x_1	y_1
35.82	0.0244	0.0649
39.06	0.0506	0.1195
41.18	0.0714	0.1464
41.32	0.0706	0.1490
43.57	0.0933	0.1748
43.63	0.0944	0.1749
46.82	0.1302	0.2039
46.44	0.1209	0.2011
48.45	0.1428	0.2162
50.95	0.1690	0.2282
51.61	0.1805	0.2254
51.95	0.1927	0.2229

HD-NA systems (BAC = 3)



ETHYLENE (1) + DICHLOROMETHANE (2)

CAS	74-85-1	75-09-2
InChiKey	VGGSQFUCUMXWEO-UHFFFAOYSA-N	YMWUJEATGCHHMB-UHFFFAOYSA-N
T_c / K	282.34	510.00
P_c / bar	50.41	60.80
ω	0.086	0.199

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 124.6$

$B/\text{MPa} = 1046$

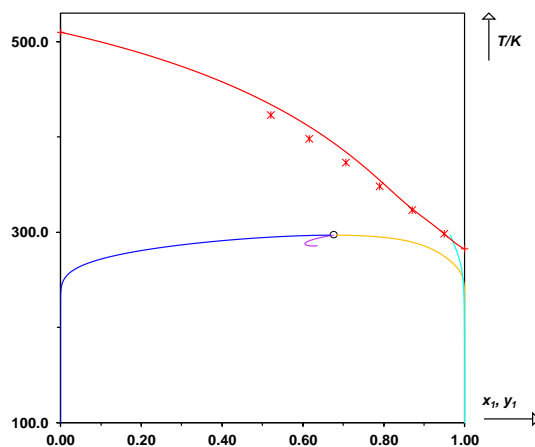
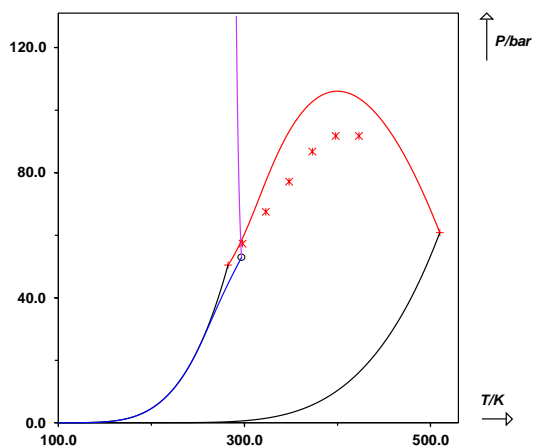
Deviations

MAPE on $x = 8.2\%$

MAPE on $y = 4.2\%$

MAPE on $x_c = 5.7\%$

MAPE on $P_c = 14\%$



Isothermal phase equilibrium data

Lebedeva, E.S. - Khodeeva, S.M., Phase equilibrium and volume relations in the system methylene chloride-ethylene, Tr. Gos. Nauchno Issled. Proektn. Inst. Azotn. Promst. Prod. Org. Sin. 13 (1963) 79-90.

T / K = 398.15

P / bar	x ₁	y ₁	
14.19	0.0350	0.2180	
18.24	0.0500	0.4500	
22.29	0.0650	0.5400	
30.40	0.1240	0.6250	
35.46	0.1500	0.6580	
49.14	0.2500	0.7050	
61.81	0.3500	0.7320	
72.95	0.4500	0.7400	
91.70	0.6150	0.6150	CRIT

Lebedeva, E.S. - Khodeeva, S.M., Phase equilibrium and volume relations in the system methylene chloride-ethylene, Tr. Gos. Nauchno Issled. Proektn. Inst. Azotn. Promst. Prod. Org. Sin. 13 (1963) 79-90.

T / K = 423.15

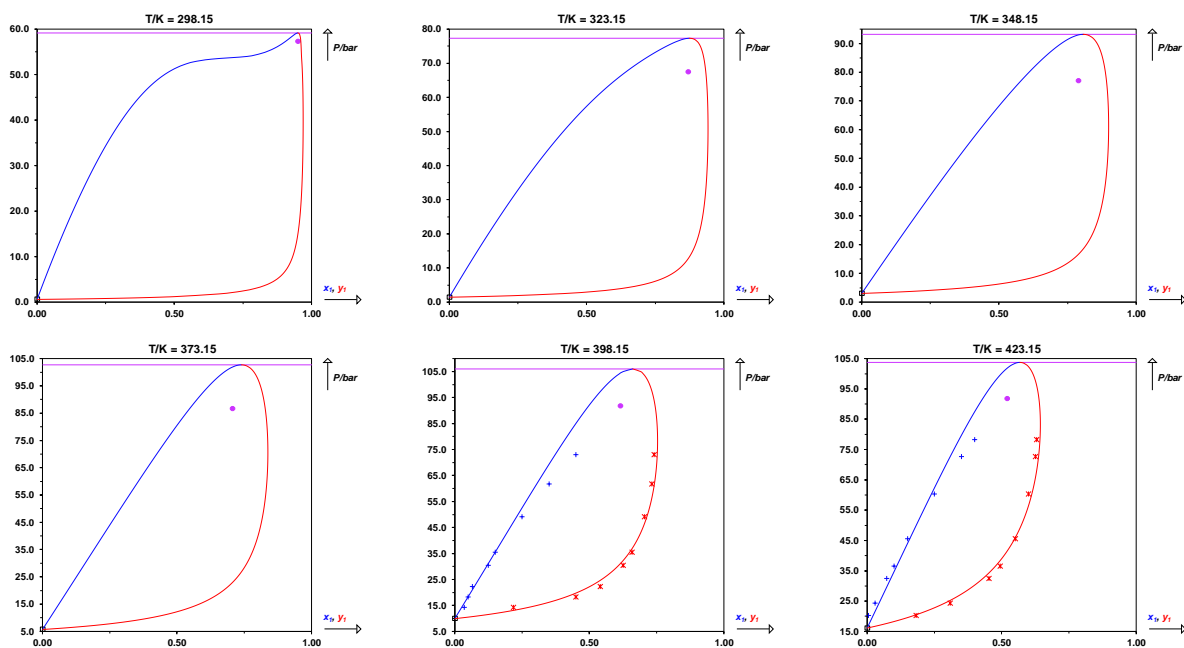
P / bar	x ₁	y ₁	
20.27	0.0050	0.1820	
24.32	0.0300	0.3080	
32.42	0.0720	0.4530	
36.48	0.1000	0.4950	
45.60	0.1500	0.5500	
60.29	0.2500	0.6000	
72.65	0.3500	0.6250	
78.22	0.4000	0.6300	
91.70	0.5200	0.5200	CRIT

Critical point

Lebedeva, E.S. - Khodeeva, S.M., Phase equilibrium and volume relations in the system methylene chloride-ethylene, Tr. Gos. Nauchno Issled. Proektn. Inst. Azotn. Promst. Prod. Org. Sin. 13 (1963) 79-90.

T / K	P / bar	x ₁
298.15	57.25	0.9500
323.15	67.38	0.8700
348.15	77.01	0.7900
373.15	86.63	0.7060

HD-NA systems (BAC = 3)



DICHLOROMETHANE (1) + n-PENTANE (2)

CAS	75-09-2	109-66-0
InChiKey	YMWUJEATGCHHMB-UHFFFAOYSA-N	OFBQJSOFQDEBGM-UHFFFAOYSA-N
T_c / K	510.00	469.70
P_c / bar	60.80	33.70
ω	0.199	0.252

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results
Parameters

$A/\text{MPa} = 77.46$

$B/\text{MPa} = 129.7$

Deviations

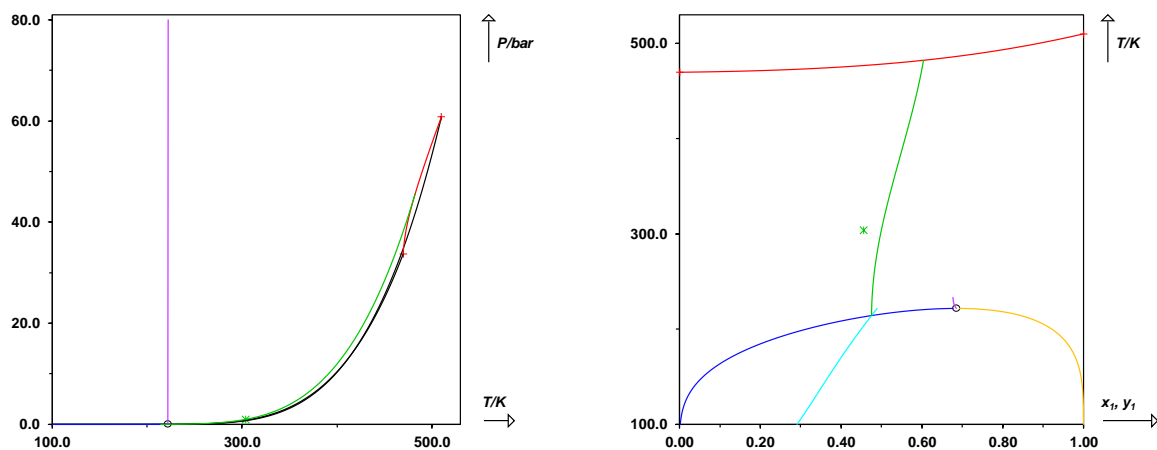
MAPE on $x = 14\%$

MAPE on $y = 8.5\%$

MAPE on $x_{az} = 9.0\%$

MAPE on $P_{az} = 0.09\%$

MAPE on $h^M = 4.7\%$



		304.35	0.2650 0.3310
Isothermal phase equilibrium data		304.73	0.2180 0.2990
		305.97	0.1120 0.1810
		306.81	0.0710 0.1210
		307.07	0.0550 0.1030
		308.01	0.0170 0.0410

Zurita, Jose L. - De Soria, Maria L. G. - Postigo, Miguel A. - Katz, Miguel, Vapor-liquid equilibrium for the n-pentane-dichloromethane system at 298.15 K, Journal of Chemical & Engineering Data. 31 (1986) 389-390.

doi:10.1021/je00046a005

T / K = 298.15

P / bar	x ₁	y ₁
0.6330	0.9631	0.8977
0.6706	0.9356	0.8408
0.7073	0.8910	0.7620
0.7445	0.8394	0.6837
0.7701	0.7485	0.6130
0.7901	0.6774	0.5667
0.8078	0.5792	0.5102
0.8198	0.4439	0.4407
0.8131	0.3636	0.3937
0.8118	0.3493	0.3831
0.7825	0.2226	0.2954
0.7611	0.1552	0.2349

Isobaric phase equilibrium data

Tenn, F. G. - Missen, R. W., A study of the condensation of binary vapors of miscible liquids: Part I: The equilibrium relations, The Canadian Journal of Chemical Engineering. 41 (1963) 12-14. doi:10.1002/cjce.5450410105

P / bar = 0.9999

T / K	x ₁	y ₁	
312.03	0.9940	0.9800	
311.89	0.9910	0.9720	
311.47	0.9850	0.9540	
311.15	0.9800	0.9390	
310.63	0.9720	0.9180	
310.17	0.9620	0.8940	
309.63	0.9500	0.8650	
308.89	0.9300	0.8300	
308.01	0.9030	0.7980	
307.15	0.8720	0.7640	
306.17	0.8250	0.7250	
305.35	0.7700	0.6800	
304.65	0.7010	0.6290	
304.09	0.6160	0.5670	
303.75	0.4550	0.4550	AZEO
303.81	0.3780	0.4080	
303.83	0.3740	0.4060	
303.95	0.3460	0.3890	
304.13	0.3060	0.3600	

Enthalpy of mixing

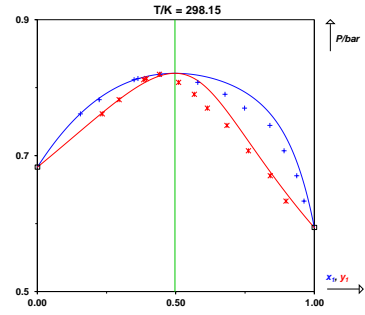
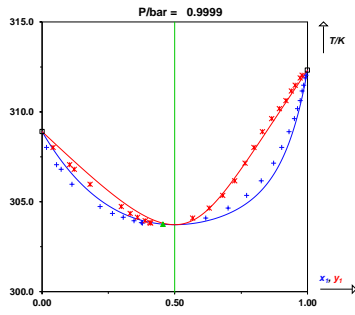
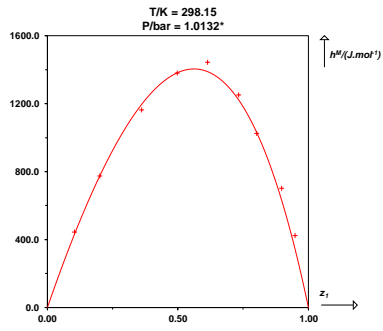
Postigo, Miguel A. - Zurita, José L. - Soria, María L. G. De - Katz, Miguel, Excess thermodynamic properties of n-pentane + dichloromethane system at 298.15 K, Canadian Journal of Chemistry. 64 (1986) 1966-1968. doi:10.1139/v86-325

T / K = 298.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
424.00	0.9479
701.00	0.8973
1026.0	0.8014
1251.0	0.7328
1443.0	0.6130
1380.0	0.4968
1164.0	0.3614
774.00	0.2009
444.00	0.1035

HD-NA systems (BAC = 3)



DICHLOROMETHANE (1) + CARBON TETRACHLORIDE (2)

CAS	75-09-2	56-23-5
InChiKey	YMWUJEATGCHHMB-UHFFFAOYSA-N	VZGDMQKNWNREIO-UHFFFAOYSA-N
T_c / K	510.00	556.35
P_c / bar	60.80	45.60
ω	0.199	0.193

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 30.90$

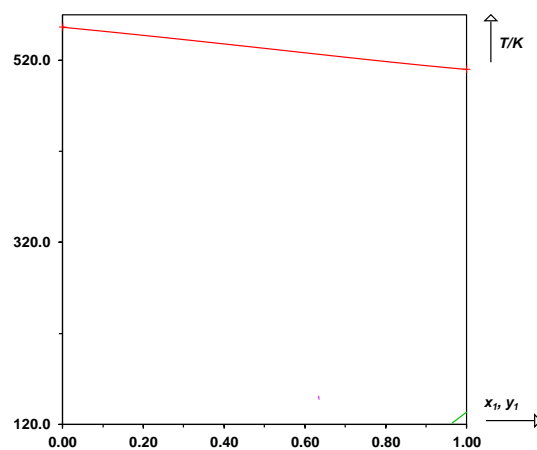
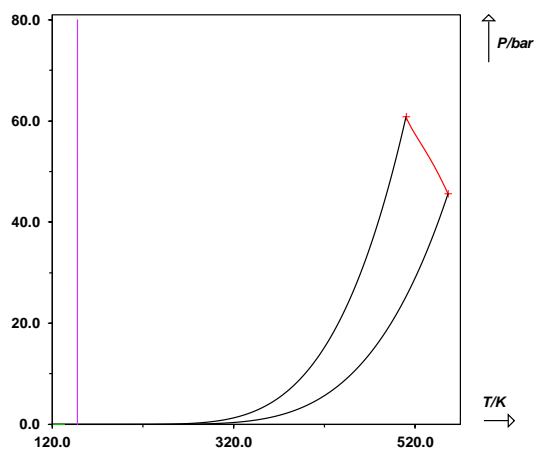
$B/\text{MPa} = 62.71$

Deviations

MAPE on $x = 3.5\%$

MAPE on $y = 3.6\%$

MAPE on $h^M = 8.5\%$



Isothermal phase equilibrium data

Azpiazu, Y. - Royo, F. - Gutiérrez Losa, C., Vapour pressures of (tetrachloromethane + α,ω -dichloroalkane), The Journal of Chemical Thermodynamics. 16 (1984) 561-565. doi:10.1016/0021-9614(84)90007-7

T / K = 303.15		
P / bar	x_1	y_1
0.2606	0.0820	0.3250
0.2890	0.1240	0.4140
0.2934	0.1350	0.4350
0.3236	0.1740	0.5020
0.3350	0.1930	0.5300
0.3650	0.2380	0.5820
0.4318	0.3410	0.6940
0.5073	0.4900	0.7840
0.5318	0.5590	0.8170
0.5403	0.5740	0.8240
0.5846	0.6600	0.8650
0.5995	0.6920	0.8790
0.5980	0.6960	0.8810
0.6260	0.7470	0.9030
0.6669	0.8500	0.9360
0.6740	0.8890	0.9510
0.6874	0.9280	0.9620

Rulewicz, G. - Schubert, H. - Leibnitz, E., Untersuchungen über das Dampf-Flüssigkeits-Phasengleichgewicht des Systems

Methylchlorid/Chloroform/Tetrachlorkohlenstoff bei 45°C unter Verwendung einer gaschromatographischen Analysenmethode, Journal für Praktische Chemie. 37 (1968) 122-136. doi:10.1002/prac.19680370303

T / K = 318.15		
P / bar	x_1	y_1
0.3806	0.0250	0.1170
0.4140	0.0500	0.2110
0.4773	0.1000	0.3520
0.5386	0.1500	0.4540
0.5926	0.2000	0.5340
0.6425	0.2500	0.5940
0.6906	0.3000	0.6430
0.7359	0.3500	0.6850
0.7799	0.4000	0.7220
0.8215	0.4500	0.7530
0.8597	0.5000	0.7800
0.8977	0.5500	0.8070
0.9339	0.6000	0.8300
0.9686	0.6500	0.8510
1.004	0.7000	0.8720

1.039	0.7500	0.8930
1.074	0.8000	0.9160
1.108	0.8500	0.9380
1.144	0.9000	0.9590
1.157	0.9200	0.9670
1.179	0.9500	0.9790
1.193	0.9700	0.9870

Enthalpy of mixing

Marongiu, B., Excess Enthalpies of alpha,omega-Dichloroalkane (C1 - C6) + Tetrachloromethane, Int. Data Ser. Sel. Data Mixtures Ser. A. (1988) 1-6.

T / K = 298.15
P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1
137.00	0.0533
270.00	0.1165
397.00	0.1948
510.00	0.2884
567.00	0.3603
602.00	0.4369
608.00	0.4987
594.00	0.5621
548.00	0.6372
481.00	0.7060
360.00	0.7955
277.00	0.8477
135.00	0.9276

Siddiqi, M.A. - Lucas, K., The excess enthalpy of (tetrachloromethane + carbon disulphide) and (tetrachloromethane + dichloromethane) over a range of temperatures and pressures, The Journal of Chemical Thermodynamics. 15 (1983) 1181-1187. doi:10.1016/0021-9614(83)90009-5

T / K = 298.15
P / bar = 150.00

$h^M / \text{J.mol}^{-1}$	z_1
402.80	0.2010
445.90	0.2320
534.70	0.3340
583.80	0.4300
605.40	0.5180
586.60	0.6010
558.10	0.6620
492.40	0.7510
291.20	0.8830

Siddiqi, M.A. - Lucas, K., The excess enthalpy of (tetrachloromethane + carbon disulphide) and (tetrachloromethane + dichloromethane) over a range of temperatures and pressures, The Journal of Chemical Thermodynamics. 15 (1983) 1181-1187. doi:10.1016/0021-9614(83)90009-5

T / K = 298.15

P / bar = 300.00

$h^M / \text{J.mol}^{-1}$	z_1
409.00	0.2010
450.00	0.2320
538.60	0.3340
592.20	0.4300
606.00	0.5180
595.00	0.6010
545.60	0.6780
486.30	0.7510
250.90	0.9000

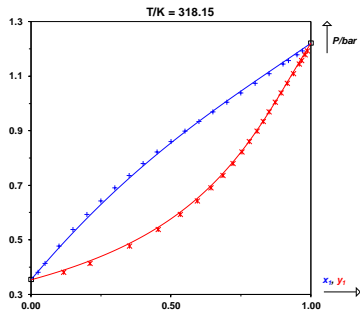
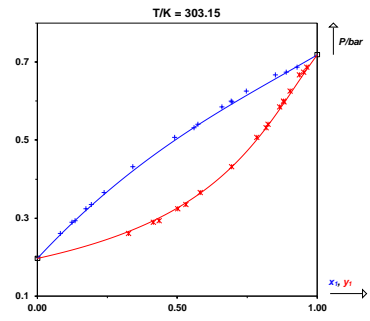
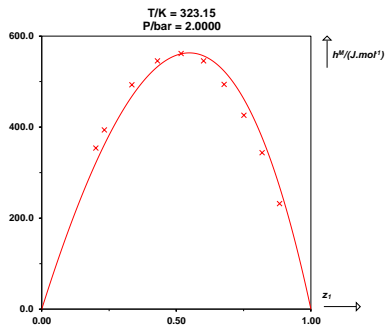
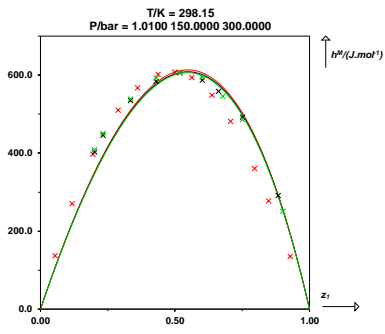
Siddiqi, M.A. - Lucas, K., The excess enthalpy of (tetrachloromethane + carbon disulphide) and (tetrachloromethane + dichloromethane) over a range of temperatures and pressures, The Journal of Chemical Thermodynamics. 15 (1983) 1181-1187. doi:10.1016/0021-9614(83)90009-5

T / K = 323.15

P / bar = 2.000

$h^M / \text{J.mol}^{-1}$	z_1
353.50	0.2010
394.00	0.2320
492.80	0.3340
545.80	0.4300
561.80	0.5180
545.90	0.6010
493.90	0.6780
426.20	0.7510
343.60	0.8190
231.60	0.8830

HD-NA systems (BAC = 3)



NITROGEN (1) + CHLORODIFLUOROMETHANE (2)

CAS	7727-37-9	75-45-6
InChiKey	MDFNEOEWAXZRQ-UHFFFAOYSA-N	VOPWNXZWBXDODV-UHFFFAOYSA-N
T_c / K	126.20	369.30
P_c / bar	34.00	49.71
ω	0.038	0.219

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 72.72$

$B/\text{MPa} = 280.0$

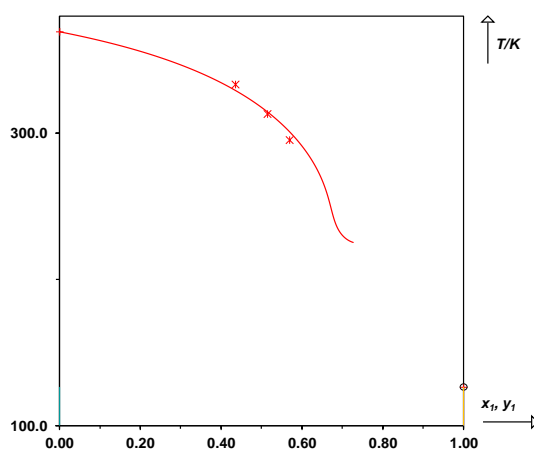
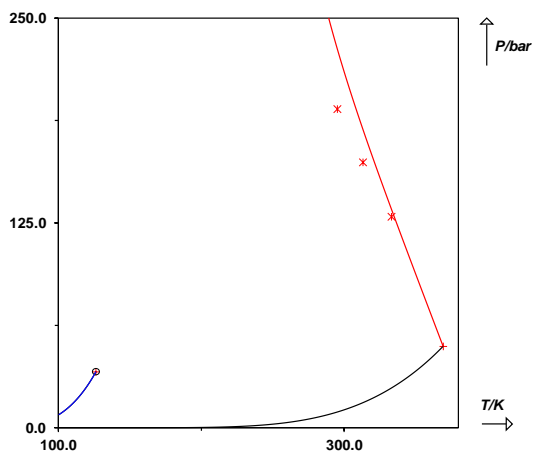
Deviations

MAPE on $x = 4.4\%$

MAPE on $y = 5.4\%$

MAPE on $x_c = 3.4\%$

MAPE on $P_c = 12\%$



Isothermal phase equilibrium data

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 263.20

P / bar	x ₁	y ₁
10.96	0.0130	0.6460
14.25	0.0170	0.7270
23.66	0.0320	0.8040
28.88	0.0400	0.8410
35.55	0.0520	0.8750
40.94	0.0610	0.8860
45.69	0.0730	0.8930
50.22	0.0790	0.8970

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 268.20

P / bar	x ₁	y ₁
8.320	0.0080	0.4780
15.54	0.0200	0.6860
20.30	0.0280	0.7370
25.97	0.0370	0.8110
29.90	0.0440	0.8350
35.98	0.0540	0.8520
40.76	0.0650	0.8630
45.72	0.0730	0.8720
51.28	0.0830	0.8780

Nohka, Junichi - Sarashina, Eiji - Arai, Yasuhiko - Saito, Shozaburo, Correlation Of Vapor-Liquid Equilibria For Systems Containing A Polar Component By The Bwr Equation, Journal of Chemical Engineering of Japan. 6 (1973) 10-17. doi:10.1252/jcej.6.10

T / K = 273.15

P / bar	x ₁	y ₁
25.33	0.0367	0.7550
50.66	0.0842	0.8520
75.99	0.1290	0.8730
101.33	0.1770	0.8760
126.66	0.2270	0.8690
144.29	0.2650	0.8590
160.50	0.3010	0.8450

183.09	0.3500	0.8250
200.83	0.3990	0.8010
215.32	0.4470	0.7660

Wang, X. - Wang, Y.S., Vapor-liquid equilibria for nitrogen-carbon dioxide-chlorodifluoromethane at moderate pressure, Nanjing Huagong Xueyuan Xuebao. 13 (1991) 35-44.

T / K = 273.15

P / bar	x ₁	y ₁
8.160	0.0056	0.3724
11.37	0.0113	0.5419
15.97	0.0189	0.6622
20.10	0.0267	0.7243
25.88	0.0332	0.7681
30.83	0.0448	0.7965
41.26	0.0629	0.8400
50.13	0.0771	0.8566

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 283.20

P / bar	x ₁	y ₁
10.21	0.0060	0.3070
15.97	0.0150	0.5290
19.02	0.0210	0.6020
24.18	0.0310	0.6700
25.87	0.0330	0.6840
30.83	0.0440	0.7240
35.76	0.0520	0.7520
40.66	0.0610	0.7710
49.41	0.0760	0.8030

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 288.20

P / bar	x ₁	y ₁
9.390	0.0030	0.1480
11.64	0.0070	0.2940
14.56	0.0120	0.4180
19.36	0.0190	0.5400
23.37	0.0270	0.6100
30.32	0.0410	0.6800
38.38	0.0560	0.7360

HD-NA systems (BAC = 3)

49.37 0.0780 0.7740

Maslennikova, V.Ya. - Goryunova, N.P. - Tsiklis, D.S., Phase equilibria in the nitrogen-Freon 12 and nitrogen-Freon 22 systems, Russ. J. Phys. Chem. 41 (1967) 383-385.

T / K = 295.15

 P / bar x_1 y_1

25.33 0.0350 0.5900

50.66 0.0850 0.7400

75.99 0.1350 0.7900

101.33 0.1850 0.8000

126.66 0.2400 0.7900

151.99 0.3150 0.7630

177.32 0.4100 0.7250

194.54 0.5700 0.5700 CRIT

Nohka, Junichi - Sarashina, Eiji - Arai, Yasuhiko - Saito, Shozaburo, Correlation Of Vapor-Liquid Equilibria For Systems Containing A Polar Component By The Bwr Equation, Journal of Chemical Engineering of Japan. 6 (1973) 10-17. doi:10.1252/jcej.6.10

T / K = 298.15

 P / bar x_1 y_1

25.33 0.0268 0.4980

75.99 0.1250 0.7410

95.75 0.1640 0.7550

126.66 0.2320 0.7530

142.36 0.2790 0.7480

154.22 0.3150 0.7300

165.87 0.3470 0.7040

173.97 0.3820 0.6800

179.04 0.4090 0.6600

185.93 0.4630 0.6180

Maslennikova, V.Ya. - Goryunova, N.P. - Tsiklis, D.S., Phase equilibria in the nitrogen-Freon 12 and nitrogen-Freon 22 systems, Russ. J. Phys. Chem. 41 (1967) 383-385.

T / K = 313.15

 P / bar x_1 y_1

25.33 0.0250 0.3650

50.66 0.0850 0.5850

75.99 0.1400 0.6600

101.33 0.2050 0.6850

126.66 0.2900 0.6730

151.99 0.4200 0.6100

162.12 0.5150 0.5150 CRIT

Nohka, Junichi - Sarashina, Eiji - Arai, Yasuhiko - Saito, Shozaburo, Correlation Of Vapor-Liquid Equilibria For Systems Containing A Polar Component By The Bwr Equation, Journal of Chemical Engineering of Japan. 6 (1973) 10-17. doi:10.1252/jcej.6.10

T / K = 323.15

 P / bar x_1 y_1

30.40 0.0217 0.2580

50.66 0.0638 0.4720

75.99 0.1210 0.5610

101.33 0.1850 0.5800

130.71 0.2910 0.5400

136.38 0.3270 0.5240

139.32 0.3590 0.5070

Maslennikova, V.Ya. - Goryunova, N.P. - Tsiklis, D.S., Phase equilibria in the nitrogen-Freon 12 and nitrogen-Freon 22 systems, Russ. J. Phys. Chem. 41 (1967) 383-385.

T / K = 333.15

 P / bar x_1 y_1

25.33 0.0030 0.0450

50.66 0.0670 0.3900

75.99 0.1400 0.5200

101.33 0.2300 0.5450

126.66 0.3900 0.4800

128.68 0.4350 0.4350 CRIT

Nohka, Junichi - Sarashina, Eiji - Arai, Yasuhiko - Saito, Shozaburo, Correlation Of Vapor-Liquid Equilibria For Systems Containing A Polar Component By The Bwr Equation, Journal of Chemical Engineering of Japan. 6 (1973) 10-17. doi:10.1252/jcej.6.10

T / K = 348.15

 P / bar x_1 y_1

43.87 0.0261 0.1400

49.65 0.0429 0.1980

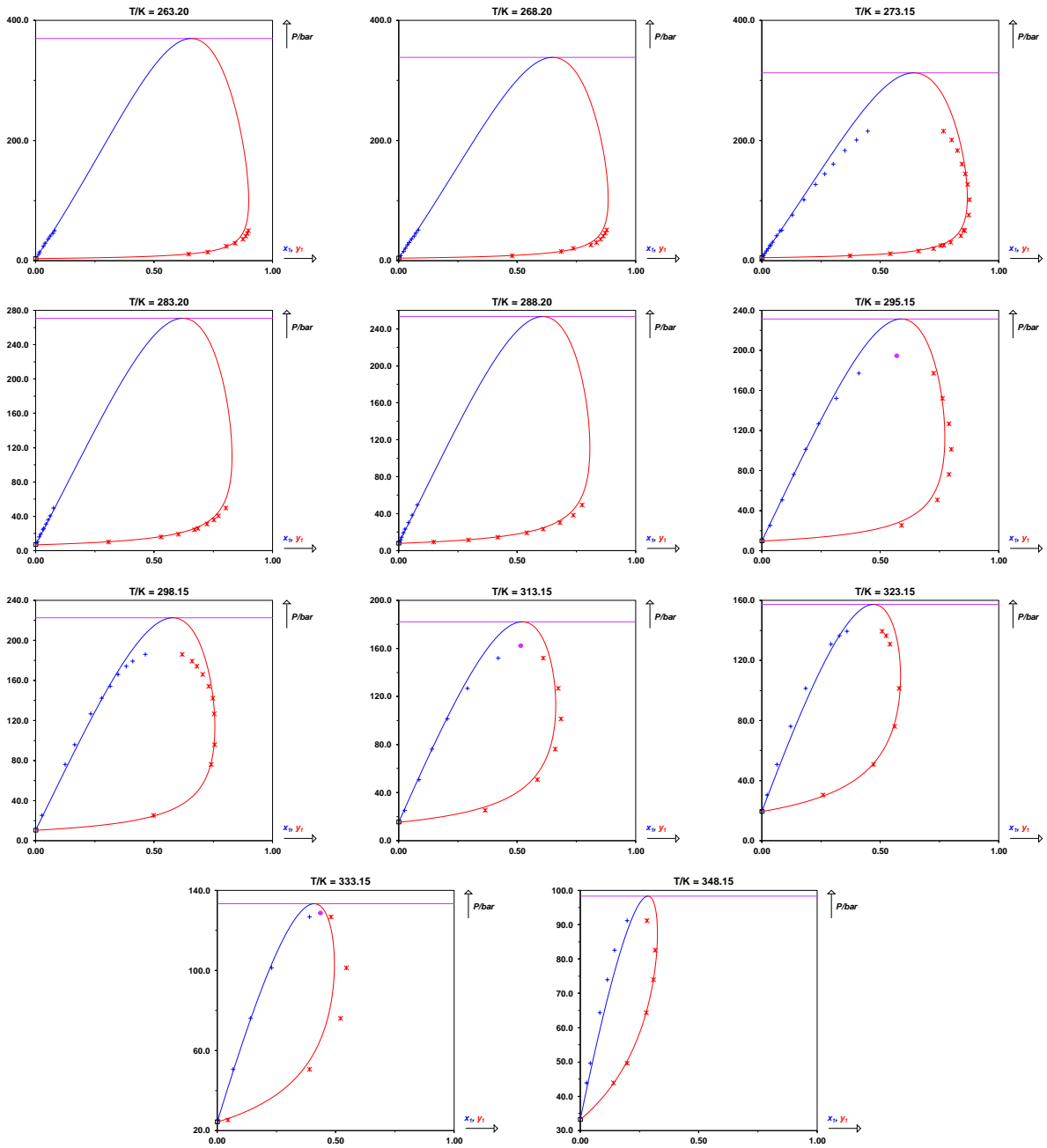
64.34 0.0820 0.2780

73.97 0.1140 0.3080

82.58 0.1450 0.3160

91.19 0.1980 0.2810

HD-NA systems (BAC = 3)



PROPYLENE (1) + CHLORODIFLUOROMETHANE (2)

CAS	115-07-1	75-45-6
InChiKey	QQONPFPTGQHPMA-UHFFFAOYSA-N	VOPWNXZWBVDODV-UHFFFAOYSA-N
T_c / K	364.85	369.30
P_c / bar	46.00	49.71
ω	0.138	0.219

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 28.92

B/MPa = 10.32

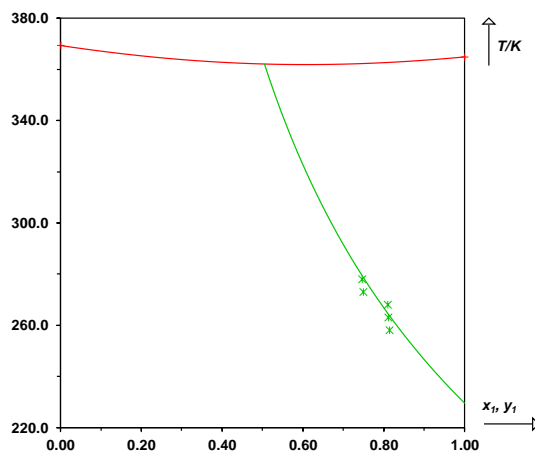
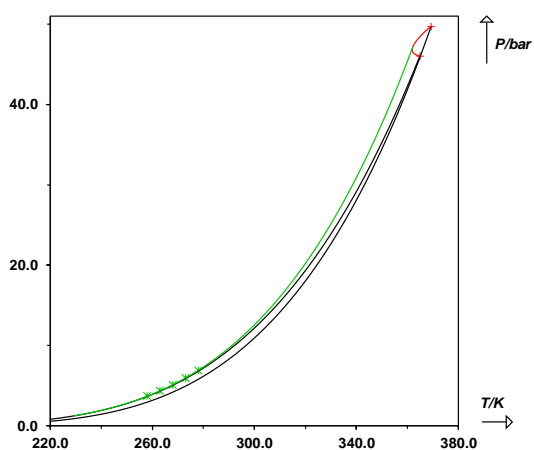
Deviations

MAPE on x = 5.8 %

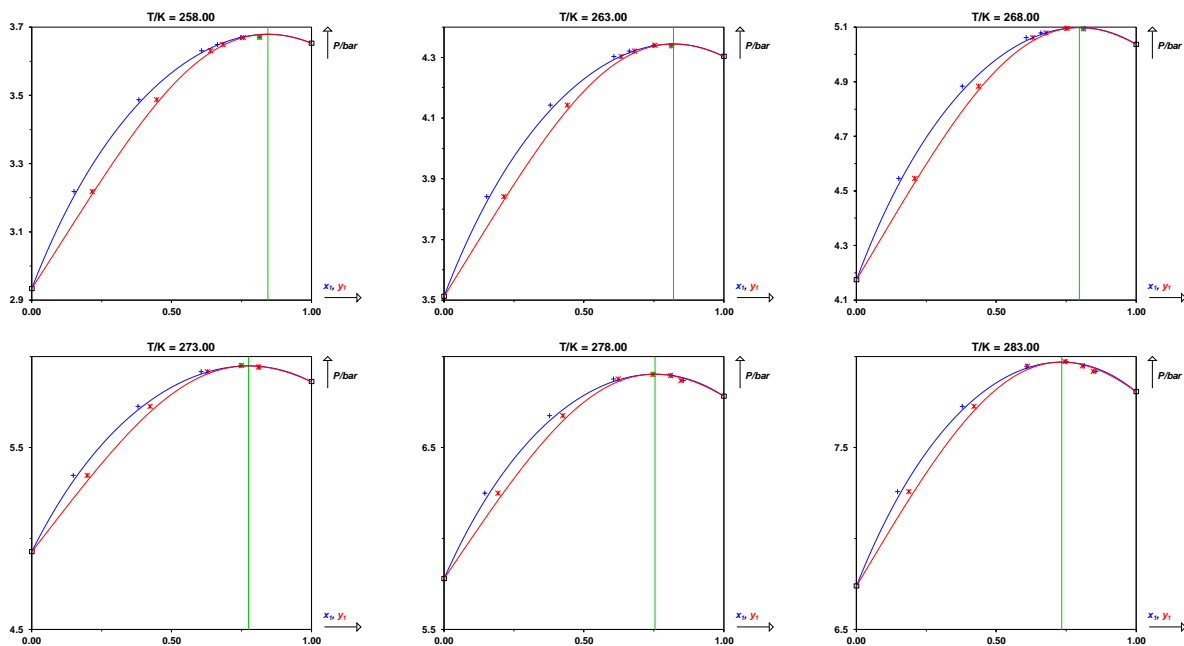
MAPE on y = 5.4 %

MAPE on x_{az} = 5.1 %

MAPE on P_{az} = 0.10 %



-----				5.726	0.3793	0.4222	
Isothermal phase equilibrium data				5.916	0.6052	0.6271	
-----				5.950	0.7472	0.7491	
Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4				5.950	0.7500	0.7500	AZEO
T / K = 258.00				5.942	0.8131	0.8098	
P / bar	x ₁	y ₁		Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4			
3.218	0.1517	0.2167		T / K = 278.00			
3.487	0.3830	0.4460		P / bar	x ₁	y ₁	
3.631	0.6070	0.6383		6.250	0.1450	0.1933	
3.649	0.6633	0.6831		6.675	0.3765	0.4233	
3.669	0.7465	0.7562		6.877	0.6060	0.6219	
3.670	0.8133	0.8138		6.903	0.7461	0.7461	AZEO
3.670	0.8141	0.8141	AZEO	6.903	0.7472	0.7465	
Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4				6.895	0.8146	0.8084	
T / K = 263.00				6.868	0.8543	0.8468	
P / bar	x ₁	y ₁		Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4			
3.841	0.1527	0.2138		T / K = 283.00			
4.143	0.3797	0.4407		P / bar	x ₁	y ₁	
4.303	0.6066	0.6329		7.257	0.1468	0.1870	
4.321	0.6618	0.6807		7.725	0.3778	0.4197	
4.340	0.7480	0.7539		7.947	0.6074	0.6106	
4.339	0.8119	0.8119	AZEO	7.972	0.7487	0.7448	
4.339	0.8139	0.8126		7.949	0.8129	0.8070	
Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4				7.918	0.8553	0.8469	
T / K = 268.00							
P / bar	x ₁	y ₁					
4.545	0.1517	0.2085					
4.884	0.3782	0.4363					
5.061	0.6073	0.6309					
5.078	0.6600	0.6768					
5.095	0.7473	0.7517					
5.094	0.8098	0.8098	AZEO				
5.094	0.8142	0.8113					
Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4							
T / K = 273.00							
P / bar	x ₁	y ₁					
5.347	0.1486	0.1989					



CARBON TETRAFLUORIDE (1) + CHLORODIFLUOROMETHANE (2)

CAS	75-73-0	75-45-6
InChiKey	TXEYQDLBPFQVAA-UHFFFAOYSA-N	VOPWNXZWBVDODV-UHFFFAOYSA-N
T_c / K	227.51	369.30
P_c / bar	37.45	49.71
ω	0.179	0.219

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 93.41

B/MPa = 136.1

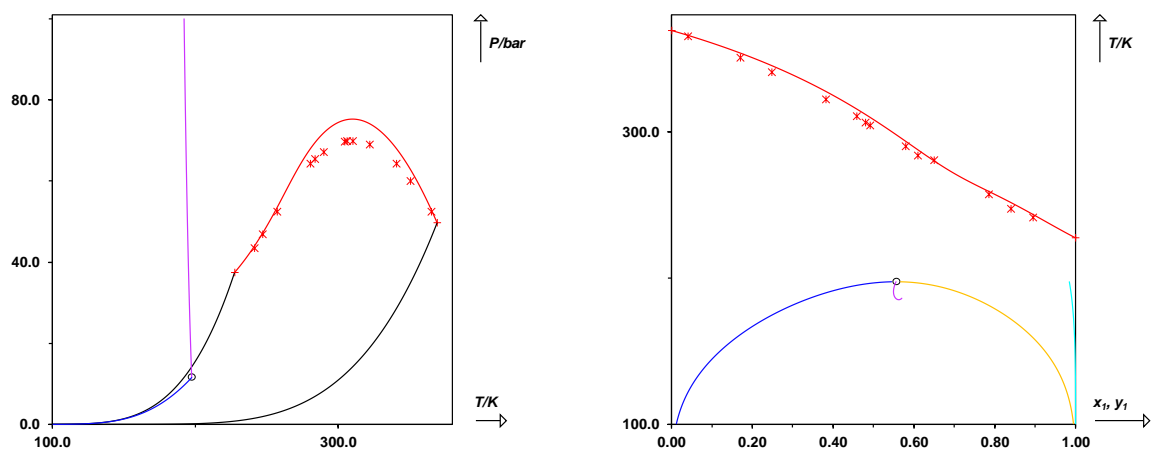
Deviations

MAPE on x = 12 %

MAPE on y = 5.8 %

MAPE on x_c = 6.8 %

MAPE on P_c = 5.0 %



-----				P / bar	x ₁	y ₁
Isothermal phase equilibrium data				3.830	0.0082	0.3882
-----				7.530	0.0300	0.6790
Baginskii, V.A. - Zakharov, N.D. - Lapardin, N.I., Study and calculation of the liquid-vapor phase equilibrium of mixtures of refrigerants, Issled. Teplofiz. Svoistv Rab. Veshchestv i Protsessov Teploobmena v Kholod. Tekhn., L. 9 (1989) 9-15.				12.66	0.0653	0.7933
T / K = 180.44				20.48	0.1341	0.8623
P / bar	x ₁	y ₁		28.02	0.2183	0.8866
3.840	0.0921	0.9933		37.55	0.3965	0.8985
6.080	0.3269	0.9975		38.32	0.4095	0.8976
6.480	0.5830	0.9969		41.77	0.5148	0.8966
6.650	0.7121	0.9971		43.17	0.5737	0.8973

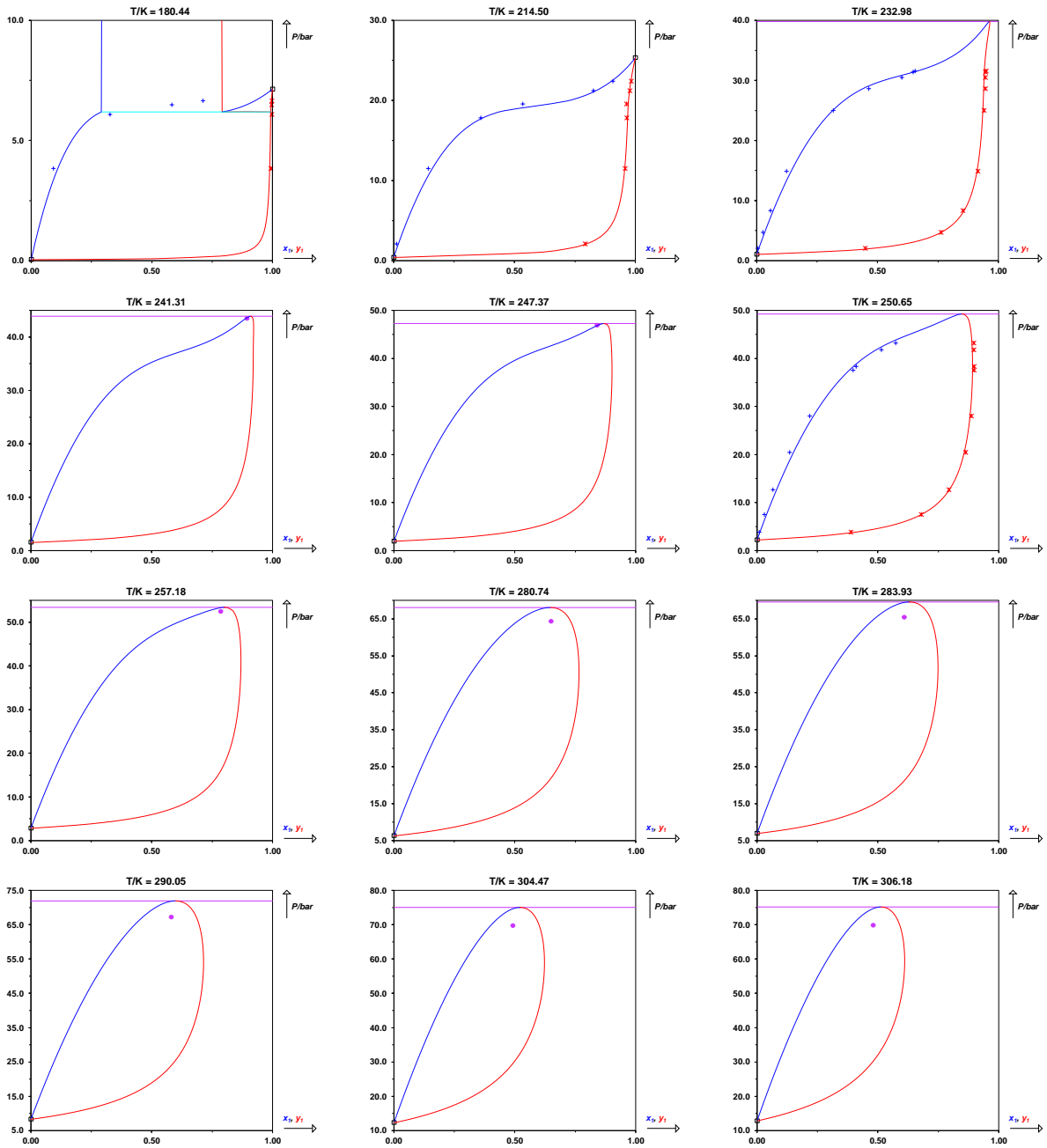
Critical point

Baginskii, V.A. - Zakharov, N.D. - Lapardin, N.I., Study and calculation of the liquid-vapor phase equilibrium of mixtures of refrigerants, Issled. Teplofiz. Svoistv Rab. Veshchestv i Protsessov Teploobmena v Kholod. Tekhn., L. 9 (1989) 9-15.				Lavrenchenko, G.K. - Valyakin, V.N., Liquid-liquid, liquid-liquid-vapor, and liquid-vapor equilibria in binary Freon and Freon-hydrocarbon mixtures based on tetrafluoromethane (R14), Teplofiz. Svoistva Veshchestv Mater. 22 (1985) 10-18.		
T / K = 214.50				T / K	P / bar	x ₁
P / bar	x ₁	y ₁		241.31	43.48	0.8945
2.100	0.0116	0.7929		247.37	46.85	0.8405
11.51	0.1435	0.9571		257.18	52.45	0.7855
17.83	0.3600	0.9643		280.74	64.32	0.6505
19.57	0.5340	0.9628		283.93	65.39	0.6095
21.23	0.8264	0.9771		290.05	67.17	0.5800
22.40	0.9070	0.9835		304.47	69.73	0.4920

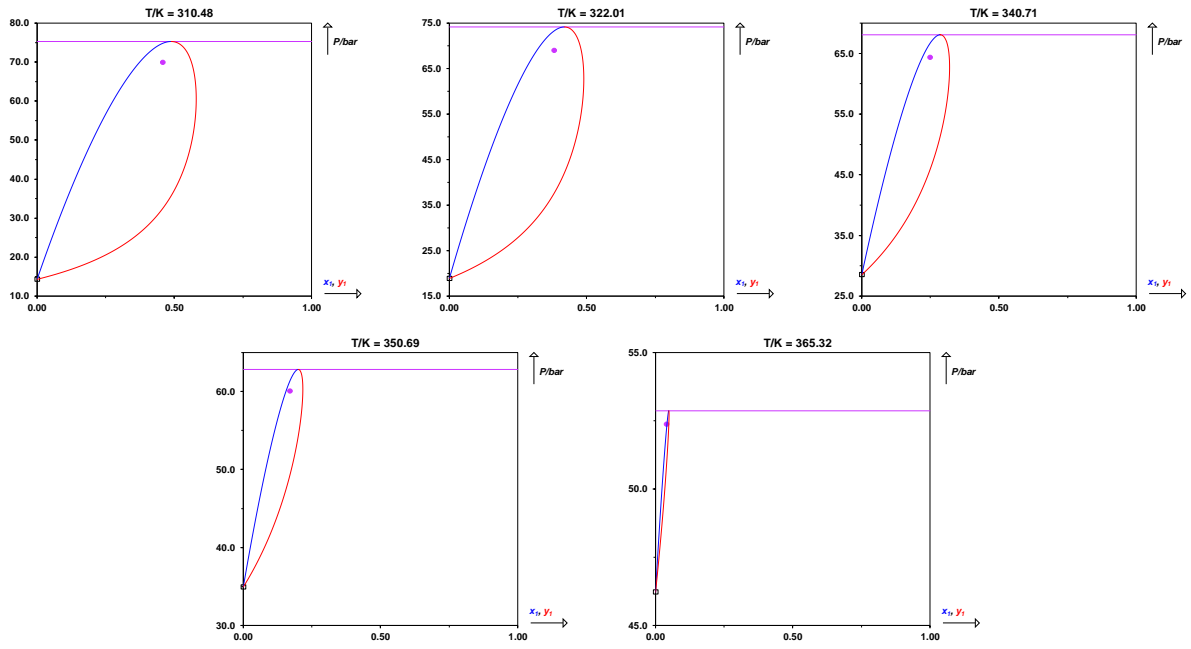
Baginskii, V.A. - Zakharov, N.D. - Lapardin, N.I., Study and calculation of the liquid-vapor phase equilibrium of mixtures of refrigerants, Issled. Teplofiz. Svoistv Rab. Veshchestv i Protsessov Teploobmena v Kholod. Tekhn., L. 9 (1989) 9-15.				306.18	69.83	0.4800
T / K = 232.98				310.48	69.91	0.4580
P / bar	x ₁	y ₁		322.01	68.96	0.3815
2.060	0.0046	0.4487		340.71	64.32	0.2485
4.710	0.0264	0.7632		350.69	60.06	0.1700
8.330	0.0563	0.8530		365.32	52.37	0.0405
14.88	0.1233	0.9152				
24.98	0.3168	0.9411				
28.64	0.4631	0.9460				
30.49	0.6000	0.9460				
31.41	0.6476	0.9460				
31.55	0.6559	0.9485				

Baginskii, V.A. - Zakharov, N.D. - Lapardin, N.I., Study and calculation of the liquid-vapor phase equilibrium of mixtures of refrigerants, Issled. Teplofiz. Svoistv Rab. Veshchestv i Protsessov Teploobmena v Kholod. Tekhn., L. 9 (1989) 9-15.						
T / K = 250.65						

HD-NA systems (BAC = 3)



HD-NA systems (BAC = 3)



CHLORODIFLUOROMETHANE (1) + DICHLORODIFLUOROMETHANE (2)

CAS	75-45-6	75-71-8
InChiKey	VOPWNXZWBVDODV-UHFFFAOYSA-N	PXBRQCKWGAHEHS-UHFFFAOYSA-N
T_c / K	369.30	384.95
P_c / bar	49.71	41.25
ω	0.219	0.180

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 37.20$

$B/\text{MPa} = 57.87$

Deviations

MAPE on $x = 6.4\%$

MAPE on $y = 6.6\%$

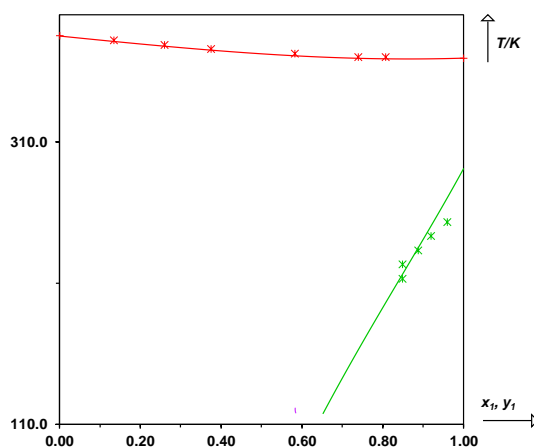
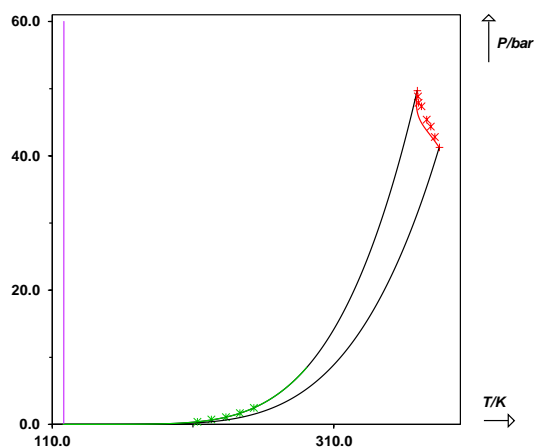
MAPE on $x_c = 19\%$

MAPE on $P_c = 3.8\%$

MAPE on $x_{az} = 14\%$

MAPE on $P_{az} = 1.6\%$

MAPE on $h^M = 7.2\%$



HD-NA systems (BAC = 3)

-----				0.7071	0.0685	0.1892	
Isothermal phase equilibrium data				0.7649	0.1345	0.3121	
-----				0.8149	0.1979	0.3936	
Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.				0.8591	0.2590	0.4530	
T / K = 213.15				0.9277	0.3747	0.5296	
P / bar	x ₁	y ₁		0.9797	0.4824	0.5966	
0.2650	0.0686	0.2054		1.017	0.5830	0.6680	
0.2890	0.1345	0.3156		1.042	0.6772	0.7246	
0.3100	0.1979	0.3925		1.060	0.7654	0.7917	
0.3270	0.2590	0.4467		1.065	0.8075	0.8240	
0.3480	0.3747	0.5276		1.068	0.8483	0.8548	
0.3740	0.4825	0.5956		1.069	0.8879	0.8879	AZEO
0.3890	0.5830	0.6524		1.067	0.9264	0.9211	
0.4000	0.6772	0.7087		1.063	0.9637	0.9512	
0.4060	0.7654	0.7782		Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.			
0.4070	0.8075	0.8116		T / K = 243.15			
0.4080	0.8483	0.8483	AZEO	P / bar	x ₁	y ₁	
0.4070	0.8879	0.8762		1.096	0.0685	0.1879	
0.4040	0.9264	0.9111		1.178	0.1345	0.3098	
0.3980	0.9637	0.9489		1.245	0.1979	0.3847	
Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.				1.305	0.2590	0.4392	
T / K = 223.15				1.406	0.3747	0.5255	
P / bar	x ₁	y ₁		1.487	0.4824	0.5985	
0.4490	0.0686	0.1979		1.551	0.5830	0.6680	
0.4880	0.1345	0.3214		1.599	0.6772	0.7343	
0.5230	0.1979	0.4013		1.630	0.7654	0.7967	
0.5520	0.2590	0.4573		1.641	0.8075	0.8289	
0.5970	0.3747	0.5366		1.648	0.8483	0.8651	
0.6300	0.4825	0.6043		1.651	0.9188	0.9188	AZEO
0.6550	0.5830	0.6625		1.649	0.9637	0.9534	
0.6720	0.6772	0.7229		Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.			
0.6820	0.7654	0.7866		T / K = 253.15			
0.6850	0.8075	0.8207		P / bar	x ₁	y ₁	
0.6860	0.8483	0.8483	AZEO	1.626	0.0685	0.1728	
0.6850	0.8879	0.8770		1.734	0.1345	0.2899	
0.6820	0.9264	0.9111		1.836	0.1979	0.3714	
0.6760	0.9637	0.9489		1.927	0.2590	0.4328	
Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.				2.084	0.3747	0.5245	
T / K = 233.15				2.209	0.4824	0.5966	
P / bar	x ₁	y ₁		2.307	0.5830	0.6698	
				2.377	0.6772	0.7351	
				2.425	0.7654	0.7933	
				2.453	0.8483	0.8563	

HD-NA systems (BAC = 3)

2.465	0.9600	0.9600	AZEO	5.573	0.6706	0.7352
				5.695	0.7729	0.8105
Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.				5.755	0.8287	0.8549
T / K =	263.15			5.776	0.8541	0.8751
P / bar	x ₁	y ₁		5.796	0.8725	0.8884
2.362	0.0685	0.1589		5.816	0.8970	0.9086
2.519	0.1345	0.2757		5.826	0.9230	0.9305
2.663	0.1979	0.3590		5.852	0.9483	0.9527
2.790	0.2590	0.4198		5.857	0.9774	0.9780
3.006	0.3747	0.5154		5.847	0.9786	0.9788
3.179	0.4824	0.5937		5.836	0.9904	0.9902
3.315	0.5830	0.6680		Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.		
3.413	0.6772	0.7334		T / K =	283.15	
3.481	0.7654	0.7967		P / bar	x ₁	y ₁
3.521	0.8483	0.8627		4.593	0.0685	0.1422
3.542	0.9264	0.9332		4.899	0.1345	0.2506
Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.				5.164	0.1979	0.3317
T / K =	273.15			5.387	0.2590	0.3936
P / bar	x ₁	y ₁		5.761	0.3747	0.5000
3.368	0.0685	0.1525		6.065	0.4824	0.5840
3.601	0.1345	0.2602		6.316	0.5830	0.6607
3.789	0.1979	0.3409		6.514	0.6772	0.7334
3.947	0.2590	0.4046		6.655	0.7654	0.7992
4.211	0.3747	0.5093		6.745	0.8483	0.8659
4.425	0.4824	0.5927		6.792	0.9264	0.9309
4.604	0.5830	0.6680		Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967) 8-14.		
4.754	0.6772	0.7360		T / K =	293.15	
4.867	0.7654	0.7967		P / bar	x ₁	y ₁
4.943	0.8483	0.8667		6.082	0.0685	0.1254
4.972	0.9264	0.9324		6.477	0.1345	0.2361
Feng, Y. - Li, C. - Shou, Z., Vapor-Liquid Equilibrium for Freon-22 and Freon-12 Vapor Phase Fugacity from a Generalized Virial Equation, Zhejiang Daxue Xuebao. 19 (1985) 58-67.				6.833	0.1979	0.3168
T / K =	278.15			7.144	0.2590	0.3825
P / bar	x ₁	y ₁		7.647	0.3747	0.4908
4.114	0.1173	0.2012		8.044	0.4824	0.5811
4.519	0.2262	0.3463		8.366	0.5830	0.6607
4.641	0.2641	0.3898		8.621	0.6772	0.7317
4.904	0.3510	0.4820		8.811	0.7654	0.8000
5.137	0.4372	0.5567		8.946	0.8483	0.8659
5.259	0.4904	0.5945		9.037	0.9264	0.9339
5.431	0.5768	0.6610		Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-		

difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967)

8-14.

T / K =	303.15	
P / bar	x ₁	y ₁
7.952	0.0685	0.1241
8.439	0.1345	0.2324
8.895	0.1979	0.3156
9.311	0.2590	0.3836
9.978	0.3747	0.4866
10.49	0.4824	0.5733
10.91	0.5830	0.6560
11.24	0.6772	0.7299
11.49	0.7654	0.8000
11.69	0.8483	0.8691
11.83	0.9264	0.9347

Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967)

8-14.

T / K =	313.15	
P / bar	x ₁	y ₁
10.21	0.0685	0.1228
10.77	0.1345	0.2190
11.30	0.1979	0.2981
11.80	0.2590	0.3669
12.66	0.3747	0.4793
13.35	0.4824	0.5723
13.89	0.5830	0.6560
14.31	0.6772	0.7299
14.66	0.7654	0.8017
14.93	0.8483	0.8699
15.14	0.9264	0.9332

Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967)

8-14.

T / K =	323.15	
P / bar	x ₁	y ₁
13.30	0.0686	0.1137
14.01	0.1345	0.2128
14.67	0.1979	0.2911
15.27	0.2590	0.3568
16.36	0.3747	0.4678
17.27	0.4825	0.5605
18.01	0.5830	0.6505
18.61	0.6772	0.7299
19.09	0.7654	0.8001
19.48	0.8483	0.8699
19.79	0.9264	0.9355

Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967)

8-14.

T / K =	333.15	
P / bar	x ₁	y ₁
16.63	0.0686	0.1110
17.49	0.1345	0.2029
18.28	0.1979	0.2852
19.01	0.2590	0.3534
20.33	0.3747	0.4636
21.49	0.4825	0.5595
22.45	0.5830	0.6505
23.24	0.6772	0.7334
23.85	0.7654	0.8042
24.33	0.8483	0.8691
24.72	0.9264	0.9355

Kriebel, M., Liquid-vapor phase equilibriums of the binary system difluoromonochloromethane (R 22)-difluorodichloromethane (R 12), Kaeltetechnik. 19 (1967)

8-14.

T / K =	343.15	
P / bar	x ₁	y ₁
20.45	0.0686	0.1202
21.50	0.1345	0.2190
22.47	0.1979	0.2958
23.37	0.2590	0.3579
24.95	0.3747	0.4636
26.35	0.4825	0.5654
27.52	0.5830	0.6561
28.46	0.6772	0.7334
29.24	0.7654	0.8034
29.89	0.8483	0.8675
30.44	0.9264	0.9332

Nishiumi, H. - Kohmatsu, S. - Yokoyama, T. - Konda, A., Phase Behavior of the Binary Refrigerant Mixtures HCF22 - CFC12 and HCF22 - HCFC123, Fluid Phase Equilib. 104 (1995) 131-143. doi:10.1016/0378-3812(94)02644-G

T / K =	369.15	
P / bar	x ₁	y ₁
32.35	0.0540	0.0730
34.30	0.1210	0.1550
36.57	0.2120	0.2550
39.19	0.3310	0.3740
41.95	0.4480	0.4830
45.08	0.6110	0.6310
46.76	0.7240	0.7330
48.28	0.8580	0.8610

			40.40	0.2980	0.3350
Nishiumi, H. - Kohmatsu, S. - Yokoyama, T. - Konda, A., Phase Behavior of the Binary Refrigerant Mixtures HCF22 - CFC12 and HCF22 - HCFC123, Fluid Phase Equilib. 104 (1995) 131-143. doi:10.1016/0378-3812(94)02644-G			41.16	0.3270	0.3630
			41.46	0.3460	0.3810
			41.84	0.3680	0.4040
T / K = 370.15			42.35	0.3890	0.4210
P / bar	x ₁	y ₁	43.13	0.4180	0.4490
34.55	0.1180	0.1480	43.73	0.4470	0.4740
37.09	0.2160	0.2550	44.12	0.4630	0.4900
39.42	0.3140	0.3570	44.65	0.4930	0.5170
41.09	0.4000	0.4370	45.19	0.5210	0.5410
42.36	0.4570	0.4900	45.54	0.5350	0.5530
43.39	0.4940	0.5250	45.98	0.5570	0.5720
44.67	0.5480	0.5730	46.28	0.5720	0.5840
45.41	0.6020	0.6220	46.48	0.5850	0.5960
46.07	0.6330	0.6500	46.68	0.5950	0.6020
46.60	0.6670	0.6790			
47.06	0.6940	0.7030	Nishiumi, H. - Kohmatsu, S. - Yokoyama, T. - Konda, A., Phase Behavior of the Binary Refrigerant Mixtures HCF22 - CFC12 and HCF22 - HCFC123, Fluid Phase Equilib. 104 (1995) 131-143. doi:10.1016/0378-3812(94)02644-G		
47.29	0.7110	0.7200	T / K = 374.14		
47.66	0.7260	0.7330	P / bar	x ₁	y ₁
47.65	0.7280	0.7380	34.27	0.0320	0.0440
47.87	0.7380	0.7410	36.40	0.1070	0.1350
47.87	0.7395	0.7395	36.98	0.1330	0.1620
			38.53	0.1930	0.2270
Nishiumi, H. - Kohmatsu, S. - Yokoyama, T. - Konda, A., Phase Behavior of the Binary Refrigerant Mixtures HCF22 - CFC12 and HCF22 - HCFC123, Fluid Phase Equilib. 104 (1995) 131-143. doi:10.1016/0378-3812(94)02644-G			39.52	0.2260	0.2610
T / K = 372.12			39.98	0.2470	0.2780
P / bar	x ₁	y ₁	40.85	0.2940	0.3300
33.33	0.0230	0.0310	41.26	0.3130	0.3500
33.53	0.0340	0.0460	41.67	0.3310	0.3670
34.07	0.0480	0.0630	42.16	0.3440	0.3790
34.42	0.0520	0.0830	42.98	0.3770	0.4040
34.52	0.0680	0.0880	43.80	0.4080	0.4370
35.11	0.0910	0.1160	44.05	0.4170	0.4420
35.28	0.0960	0.1210	44.36	0.4340	0.4600
35.35	0.0980	0.1250	44.66	0.4430	0.4660
35.52	0.1070	0.1340	45.11	0.4630	0.4830
35.92	0.1240	0.1540	45.28	0.4770	0.4980
36.08	0.1270	0.1570	45.45	0.4820	0.5000
36.48	0.1410	0.1730	45.74	0.5000	0.5180
36.72	0.1490	0.1820	-----		
36.92	0.1580	0.1920	Enthalpy of mixing		
37.27	0.1710	0.2070	-----		
37.70	0.1840	0.2200	Geller, Z.I. - Chaikovskii, V.F. - Egorov, A.V., Heats of mixing of Freons, Teplofiz. Svoist. Zhidk. (1973) 148-152.		
38.05	0.1950	0.2320	T / K = 222.00		
38.63	0.2200	0.2590	P / bar = 0.6500		
38.88	0.2340	0.2720	h ^M / J.mol ⁻¹ z ₁		
39.17	0.2420	0.2800			
39.96	0.2790	0.3160			

461.00	0.2430
463.00	0.2430
499.00	0.3150
502.00	0.3150
525.00	0.4180
526.00	0.4180
538.00	0.5030
535.00	0.5030
476.00	0.7080
475.00	0.7080

Geller, Z.I. - Chaikovskii, V.F. - Egorov, A.V., Heats of mixing of Freons 112 and 115 with Freon 22, Kholod. Tekh. 48 (1971) 29-30.

T / K = 253.00

P / bar = UNKNOWN (4.8659)

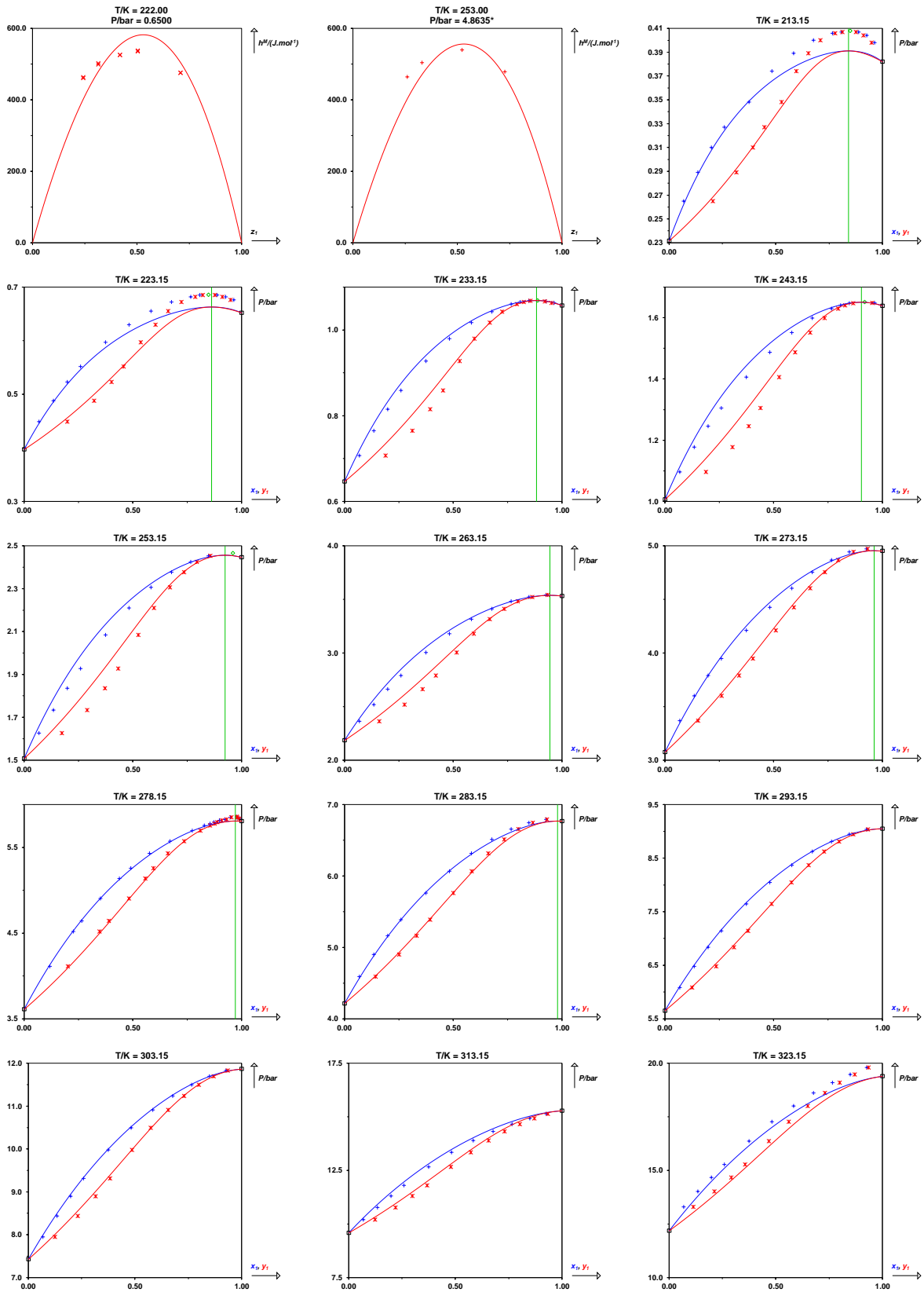
$h^M / \text{J.mol}^{-1}$	x_1
464.00	0.2600
504.20	0.3310
539.20	0.5220
478.30	0.7260

Critical point

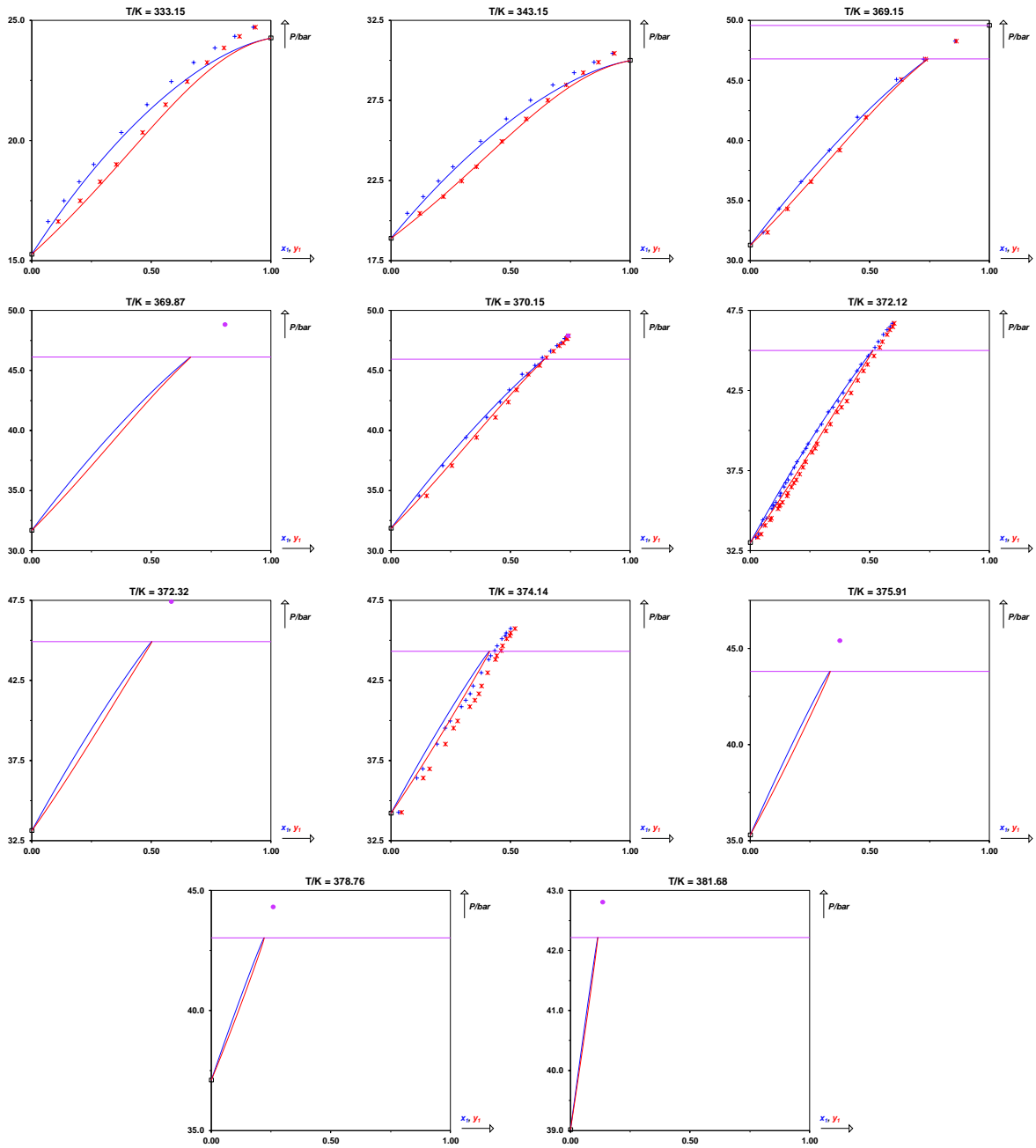
Higashi, Y. - Okazaki, S. - Takaishi, Y. - Uematsu, M. - Watanabe, K., Measurements of the vapor-liquid coexistence curve for the binary R12 + R22 system in the critical region, J. Chem. Eng. Data. 29 (1984) 31-36. doi:10.1021/je00035a012

T / K	P / bar	x_1
369.87	48.80	0.8075
372.32	47.40	0.5830
375.91	45.40	0.3747
378.76	44.30	0.2594
381.68	42.80	0.1345

HD-NA systems (BAC = 3)



HD-NA systems (BAC = 3)



ETHYL FLUORIDE (1) + 1,1,1,2-TETRAFLUOROETHANE (2)

CAS	353-36-6	811-97-2
InChiKey	UHCBBWUQDAVMS-UHFFFAOYSA-N	LVGUZGTVOIAKCC-UHFFFAOYSA-N
T_c / K	375.31	374.18
P_c / bar	50.28	40.56
ω	0.218	0.327

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

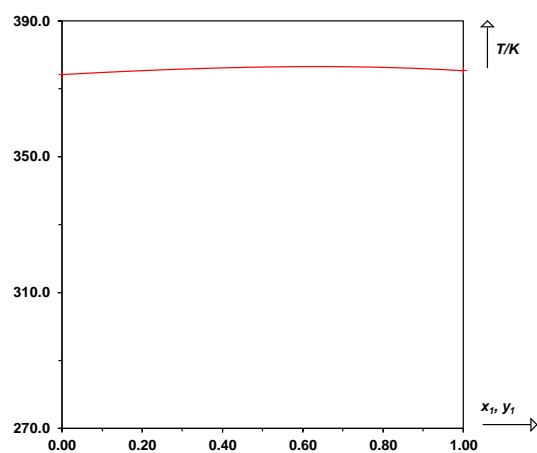
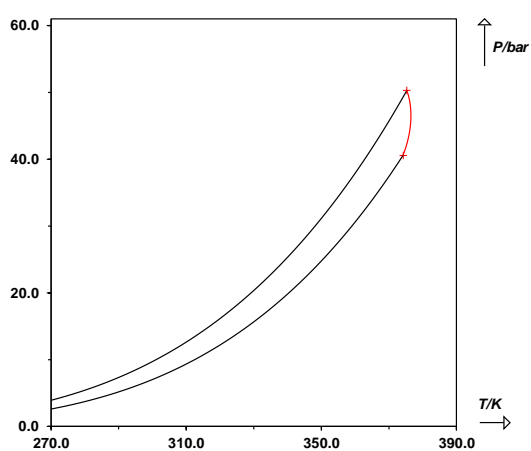
A/MPa = -7.014

B/MPa = 4.538

Deviations

MAPE on x = 1.9 %

MAPE on y = 2.8 %



Isothermal phase equilibrium data

Dong, Xueqiang - Gong, Maoqiong - Zhang, Yu - Wu, Jianfeng, Vapor-Liquid Equilibria of the Fluoroethane (R161) + 1,1,1,2-Tetrafluoroethane (R134a) System at Various Temperatures from (253.15 to 292.92) K, Journal of Chemical & Engineering Data. 53 (2008) 2193-2196. doi:10.1021/je800505y

T / K = 253.15

P / bar	x_1	y_1
1.457	0.2034	0.2596
1.532	0.3015	0.3787
1.599	0.4080	0.5022
1.680	0.5038	0.6099
1.763	0.6025	0.7109
1.868	0.7059	0.8012
1.938	0.8084	0.8762

Dong, Xueqiang - Gong, Maoqiong - Zhang, Yu - Wu, Jianfeng, Vapor-Liquid Equilibria of the Fluoroethane (R161) + 1,1,1,2-Tetrafluoroethane (R134a) System at Various Temperatures from (253.15 to 292.92) K, Journal of Chemical & Engineering Data. 53 (2008) 2193-2196. doi:10.1021/je800505y

T / K = 263.15

P / bar	x_1	y_1
2.112	0.1179	0.1406
2.173	0.1914	0.2412
2.260	0.2944	0.3604
2.349	0.3870	0.4733
2.442	0.4824	0.5810
2.568	0.5901	0.6864
2.711	0.6974	0.7852
2.832	0.8092	0.8764

Dong, Xueqiang - Gong, Maoqiong - Zhang, Yu - Wu, Jianfeng, Vapor-Liquid Equilibria of the Fluoroethane (R161) + 1,1,1,2-Tetrafluoroethane (R134a) System at Various Temperatures from (253.15 to 292.92) K, Journal of Chemical & Engineering Data. 53 (2008) 2193-2196. doi:10.1021/je800505y

T / K = 278.15

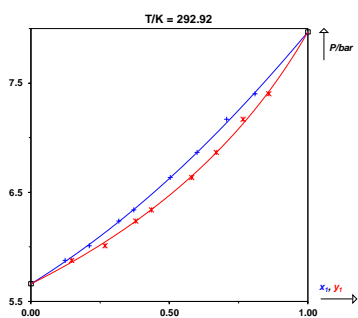
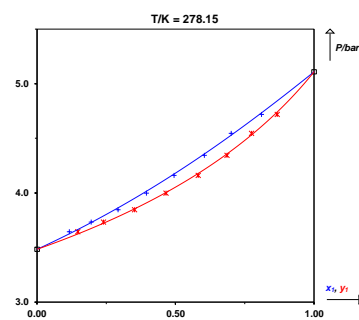
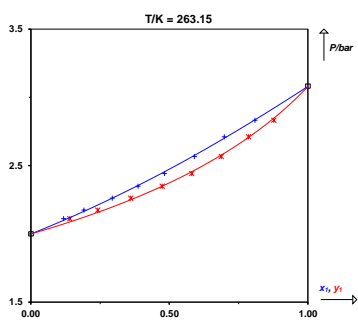
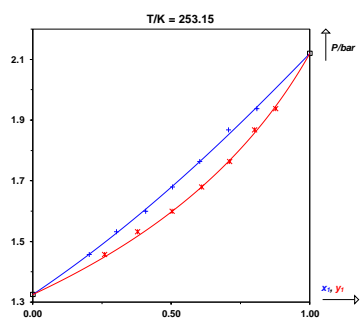
P / bar	x_1	y_1
3.643	0.1161	0.1470
3.732	0.1955	0.2402
3.847	0.2924	0.3520
3.996	0.3954	0.4650
4.160	0.4948	0.5818
4.343	0.6037	0.6854
4.544	0.7010	0.7746
4.719	0.8098	0.8668

Dong, Xueqiang - Gong, Maoqiong - Zhang, Yu - Wu, Jianfeng, Vapor-Liquid Equilibria of the Fluoroethane (R161) + 1,1,1,2-Tetrafluoroethane (R134a) System at Various Temperatures from (253.15 to 292.92) K, Journal of Chemical & Engineering Data. 53 (2008) 2193-2196. doi:10.1021/je800505y

T / K = 292.92

P / bar	x_1	y_1
5.877	0.1229	0.1466
6.010	0.2105	0.2681
6.235	0.3172	0.3780
6.339	0.3710	0.4354
6.634	0.5032	0.5808
6.866	0.5991	0.6690
7.168	0.7068	0.7658
7.402	0.8084	0.8586

HD-NA systems (BAC = 3)



HEXAFLUOROETHANE (1) + 1,1,1,2-TETRAFLUOROETHANE (2)

CAS	76-16-4	811-97-2
InChiKey	WMIYKQLTONQJES-UHFFFAOYSA-N	LVGUZGTVOIAKKC-UHFFFAOYSA-N
T_c / K	293.03	374.18
P_c / bar	30.43	40.56
ω	0.255	0.327

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

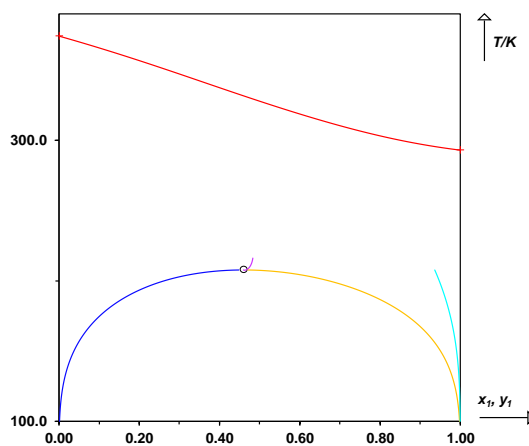
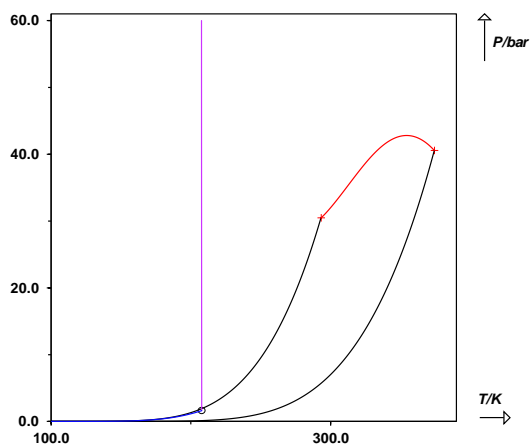
$A/\text{MPa} = 82.58$

$B/\text{MPa} = 126.3$

Deviations

MAPE on $x = 4.1\%$

MAPE on $y = 1.7\%$



Isothermal phase equilibrium data

Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4

T / K = 251.00

P / bar	x_1	y_1
8.852	0.7714	0.9083
8.463	0.6780	0.8884
7.790	0.5325	0.8635
6.521	0.3186	0.8217
5.745	0.2381	0.7880
4.761	0.1618	0.7400
3.155	0.0770	0.6039
1.859	0.0238	0.3324

Madani, Hakim - Valtz, Alain - Coquelet, Christophe - Meniai, Abdeslam Hassen - Richon, Dominique, Vapor-liquid equilibrium data for the (hexafluoroethane +1,1,1,2-tetrafluoroethane) system at temperatures from 263 to 353K and pressures up to 4.16MPa, Fluid Phase Equilibria. 268 (2008) 68-73. doi:10.1016/j.fluid.2008.04.002

T / K = 263.43

P / bar	x_1	y_1
4.001	0.0560	0.4898
5.860	0.1223	0.6537
6.998	0.1767	0.7137
7.748	0.2188	0.7443
8.806	0.2900	0.7808
10.13	0.4202	0.8195
11.54	0.6053	0.8581
13.19	0.8567	0.9232

Madani, Hakim - Valtz, Alain - Coquelet, Christophe - Meniai, Abdeslam Hassen - Richon, Dominique, Vapor-liquid equilibrium data for the (hexafluoroethane +1,1,1,2-tetrafluoroethane) system at temperatures from 263 to 353K and pressures up to 4.16MPa, Fluid Phase Equilibria. 268 (2008) 68-73. doi:10.1016/j.fluid.2008.04.002

T / K = 273.32

P / bar	x_1	y_1
4.832	0.0412	0.3794
8.305	0.1504	0.6378
10.31	0.2384	0.7140
12.32	0.3618	0.7700
14.53	0.5636	0.8245
15.95	0.7148	0.8641
17.25	0.8552	0.9143

Madani, Hakim - Valtz, Alain - Coquelet, Christophe - Meniai, Abdeslam Hassen - Richon, Dominique, Vapor-liquid equilibrium data for the (hexafluoroethane +1,1,1,2-tetrafluoroethane) system at temperatures from 263 to 353K and pressures up to 4.16MPa, Fluid Phase Equilibria. 268 (2008) 68-73. doi:10.1016/j.fluid.2008.04.002

T / K = 288.30

P / bar	x_1	y_1
7.927	0.0582	0.3649
10.71	0.1234	0.5243
12.83	0.1849	0.6041
15.42	0.2792	0.6749
17.83	0.3922	0.7277
20.31	0.5424	0.7781
22.26	0.6718	0.8195
24.78	0.8376	0.8890
25.69	0.8993	0.9243

Madani, Hakim - Valtz, Alain - Coquelet, Christophe - Meniai, Abdeslam Hassen - Richon, Dominique, Vapor-liquid equilibrium data for the (hexafluoroethane +1,1,1,2-tetrafluoroethane) system at temperatures from 263 to 353K and pressures up to 4.16MPa, Fluid Phase Equilibria. 268 (2008) 68-73. doi:10.1016/j.fluid.2008.04.002

T / K = 293.29

P / bar	x_1	y_1
8.385	0.0471	0.2989
11.73	0.1173	0.4891
13.25	0.1552	0.5471
14.48	0.1898	0.5856
16.67	0.2622	0.6415
18.69	0.3413	0.6854
20.70	0.4375	0.7253
22.68	0.5468	0.7614
24.54	0.6523	0.7971
26.79	0.7804	0.8495
27.67	0.8298	0.8738
28.32	0.8668	0.8953

Madani, Hakim - Valtz, Alain - Coquelet, Christophe - Meniai, Abdeslam Hassen - Richon, Dominique, Vapor-liquid equilibrium data for the (hexafluoroethane +1,1,1,2-tetrafluoroethane) system at temperatures from 263 to 353K and pressures up to 4.16MPa, Fluid Phase Equilibria. 268 (2008) 68-73. doi:10.1016/j.fluid.2008.04.002

T / K = 313.31

P / bar	x_1	y_1
13.36	0.0446	0.2135
16.91	0.1005	0.3644

19.48	0.1479	0.4431
23.79	0.2412	0.5373
26.63	0.3152	0.5835
29.44	0.4011	0.6238
32.30	0.4949	0.6561
34.30	0.5686	0.6741

Madani, Hakim - Valtz, Alain - Coquelet, Christophe - Meniai, Abdeslam Hassen - Richon, Dominique, Vapor-liquid equilibrium data for the (hexafluoroethane +1,1,1,2-tetrafluoroethane) system at temperatures from 263 to 353K and pressures up to 4.16MPa, Fluid Phase Equilibria. 268 (2008) 68-73. doi:10.1016/j.fluid.2008.04.002

T / K = 333.32

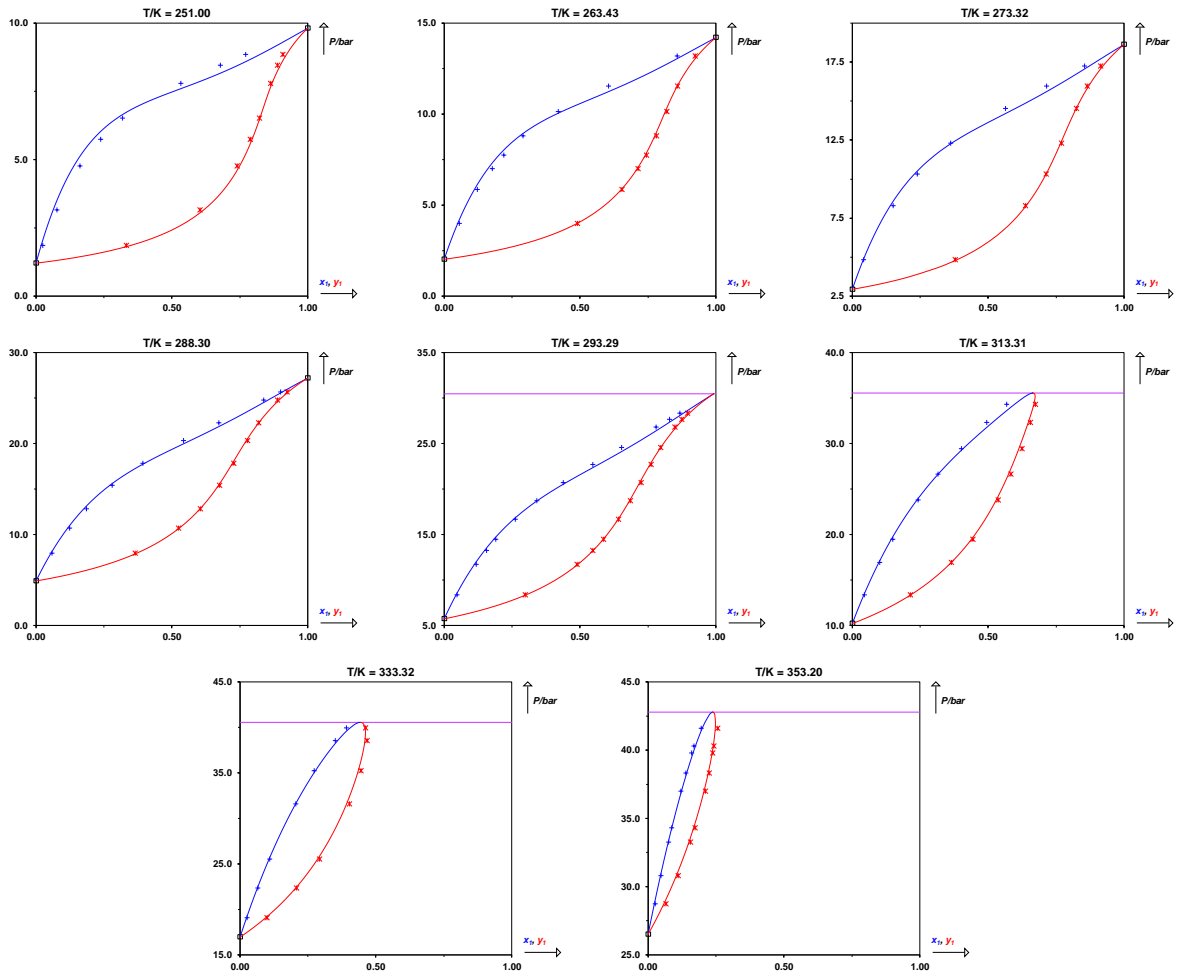
P / bar	x_1	y_1
19.10	0.0261	0.0985
22.33	0.0655	0.2073
25.54	0.1091	0.2924
31.58	0.2044	0.4028
35.24	0.2730	0.4450
38.55	0.3498	0.4676
39.96	0.3913	0.4615

Madani, Hakim - Valtz, Alain - Coquelet, Christophe - Meniai, Abdeslam Hassen - Richon, Dominique, Vapor-liquid equilibrium data for the (hexafluoroethane +1,1,1,2-tetrafluoroethane) system at temperatures from 263 to 353K and pressures up to 4.16MPa, Fluid Phase Equilibria. 268 (2008) 68-73. doi:10.1016/j.fluid.2008.04.002

T / K = 353.20

P / bar	x_1	y_1
28.75	0.0254	0.0652
30.82	0.0467	0.1105
33.27	0.0746	0.1558
34.30	0.0864	0.1731
37.01	0.1205	0.2109
38.32	0.1382	0.2254
39.78	0.1598	0.2377
40.29	0.1681	0.2417
41.61	0.1945	0.2560

HD-NA systems (BAC = 3)



CHLOROFORM (1) + BENZENE (2)

CAS	67-66-3	71-43-2
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	536.40	562.05
P_c / bar	54.72	48.95
ω	0.222	0.210

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -21.78$

$B/\text{MPa} = -31.50$

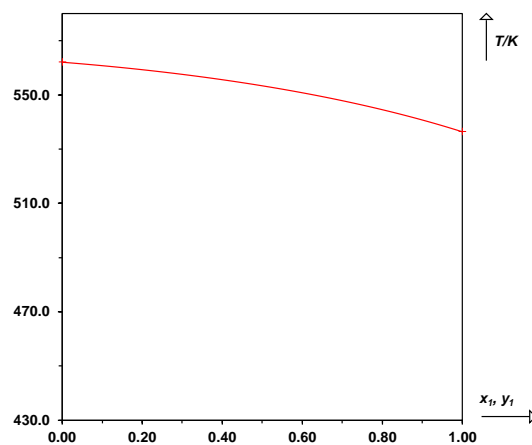
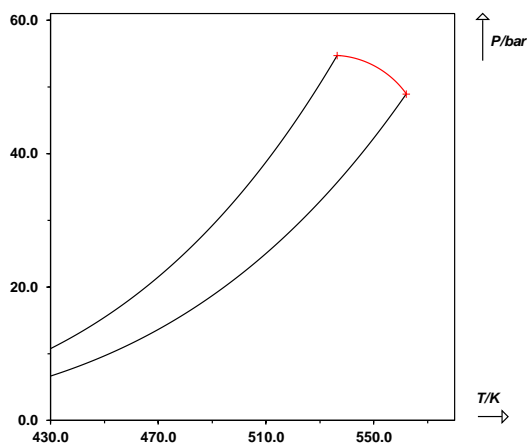
Deviations

MAPE on $x = 8.5\%$

MAPE on $y = 8.4\%$

MAPE on $h^M = 18\%$

MAPE on $c_p^M = 138\%$



Isothermal phase equilibrium data

Fu, H. - Mo, X. - Han, S. - Li, H., Study on Isothermal Vapor-Liquid Equilibrium for Ethanol - Benzene, Chloroform - Benzene and Ethanol - Chloroform Binary Systems, Shiyou Xuebao Shiyou Jiagong. 11 (1995) 87-92.

T / K =	328.15	
P / bar	x_1	y_1
0.4377	0.0168	0.0246
0.4483	0.0504	0.0774
0.4652	0.1193	0.1797
0.4781	0.1701	0.2499
0.4972	0.2343	0.3367
0.5193	0.3057	0.4401
0.5440	0.3774	0.5214
0.5559	0.4128	0.5658
0.5781	0.4689	0.6205
0.5974	0.5181	0.6726
0.6187	0.5679	0.7218
0.6664	0.6789	0.8093
0.6946	0.7396	0.8546
0.7322	0.8180	0.9088
0.7702	0.8975	0.9513
0.7985	0.9546	0.9801
0.8113	0.9819	0.9930

Fu, H. - Mo, X. - Han, S. - Li, H., Study on Isothermal Vapor-Liquid Equilibrium for Ethanol - Benzene, Chloroform - Benzene and Ethanol - Chloroform Binary Systems, Shiyou Xuebao Shiyou Jiagong. 11 (1995) 87-92.

T / K =	333.15	
P / bar	x_1	y_1
0.5278	0.0136	0.0218
0.5418	0.0617	0.0951
0.5606	0.1220	0.1855
0.5778	0.1761	0.2615
0.6127	0.2734	0.3841
0.6472	0.3602	0.4881
0.6726	0.4177	0.5579
0.7040	0.4900	0.6321
0.7322	0.5489	0.6913
0.7509	0.5871	0.7268
0.7747	0.6339	0.7678
0.7993	0.6800	0.8065
0.8271	0.7314	0.8452
0.8663	0.8028	0.8949
0.8988	0.8604	0.9300
0.9230	0.9051	0.9540
0.9482	0.9478	0.9762

Isobaric phase equilibrium data

Nagata, Isamu, Vapor-Liquid Equilibrium at Atmospheric Pressure for the Ternary System, Methyl Acetate-Chloroform-Benzene., Journal of Chemical & Engineering Data. 7 (1962) 360-366. doi:10.1021/je60014a012

P / bar =	1.013	
T / K	x_1	y_1
352.35	0.0600	0.0890
352.15	0.0680	0.1000
351.55	0.1160	0.1670
351.05	0.1330	0.1900
350.05	0.1930	0.2700
349.35	0.2290	0.3160
348.85	0.2660	0.3610
347.85	0.3180	0.4290
347.55	0.3330	0.4430
346.45	0.3880	0.5080
345.35	0.4430	0.5700
344.75	0.4670	0.6010
343.95	0.5170	0.6520
342.85	0.5700	0.7020
341.45	0.6370	0.7620
340.15	0.7000	0.8140
338.55	0.7830	0.8750
337.25	0.8530	0.9220
335.75	0.9340	0.9680

Kojima, Kazuo - Tochigi, Katsumi - Kurihara, Kiyofumi - Nakamichi, Mikiyoshi, Isobaric vapor-liquid equilibria for acetone + chloroform + benzene and the three constituent binary systems, Journal of Chemical & Engineering Data. 36 (1991) 343-345. doi:10.1021/je00003a024

P / bar =	1.013	
T / K	x_1	y_1
350.92	0.1420	0.2030
350.15	0.1850	0.2620
348.64	0.2690	0.3730
347.21	0.3470	0.4680
346.42	0.3840	0.5130
345.31	0.4490	0.5830
344.28	0.4960	0.6340
343.75	0.5240	0.6660
342.43	0.5900	0.7300
340.93	0.6590	0.7910
340.33	0.6930	0.8170
338.82	0.7680	0.8720
337.05	0.8570	0.9280
335.53	0.9350	0.9690

Chen, Geng-Hua - Wang, Qi - Ma, Zhong-Min - Yan, Xin-Huan - Han, Shi-Jun, Phase equilibria at superatmospheric pressures for systems containing halohydrocarbon, aromatic hydrocarbon, and alcohol, Journal of Chemical & Engineering Data. 40 (1995) 361-366. doi:10.1021/je00018a003

P / bar = 2.050

T / K	x_1	y_1
377.46	0.0399	0.0627
376.83	0.0709	0.1037
376.20	0.1113	0.1619
375.30	0.1544	0.2153
374.33	0.2093	0.2798
373.13	0.2579	0.3494
372.10	0.3094	0.4061
370.92	0.3707	0.4939
369.92	0.4141	0.5381
368.82	0.4621	0.5897
367.51	0.5303	0.6613
366.33	0.5781	0.7067
365.47	0.6141	0.7376
363.84	0.6819	0.7923
362.48	0.7440	0.8405
361.28	0.8091	0.8886
360.10	0.8667	0.9313
359.55	0.8973	0.9516
358.92	0.9248	0.9614
358.32	0.9521	0.9763

Chen, Geng-Hua - Wang, Qi - Ma, Zhong-Min - Yan, Xin-Huan - Han, Shi-Jun, Phase equilibria at superatmospheric pressures for systems containing halohydrocarbon, aromatic hydrocarbon, and alcohol, Journal of Chemical & Engineering Data. 40 (1995) 361-366. doi:10.1021/je00018a003

P / bar = 3.030

T / K	x_1	y_1
392.40	0.0457	0.0723
391.87	0.0847	0.1225
391.18	0.1259	0.1768
390.34	0.1879	0.2588
388.87	0.2553	0.3436
387.56	0.3207	0.4201
387.06	0.3349	0.4406
385.94	0.4070	0.5215
383.87	0.4851	0.6043
382.90	0.5279	0.6495
381.53	0.5961	0.7151
380.03	0.6555	0.7642
378.80	0.7115	0.8109

377.69	0.7515	0.8503
376.91	0.7961	0.8817
375.06	0.8715	0.9303
374.33	0.9063	0.9527
373.36	0.9380	0.9701
372.65	0.9620	0.9847
372.27	0.9880	0.9957

Enthalpy of mixing

Baud, E., Thermal analysis of binary mixtures, Bull. Soc. Chim. Fr. 17 (1915) 329-345.

T / K = 290.65

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$	x_1
-63.22	0.0670
-192.59	0.2300
-267.95	0.3400
-360.06	0.5840
-305.64	0.7370
-200.97	0.8500

Hirobe, H., Thermochemical studies, J. Fac. Sci. Univ. Tokyo Sect. 1. 1 (1926) 155-222.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$	x_1
-196.78	0.1461
-324.48	0.3115
-401.51	0.4584
-424.54	0.5601
-369.28	0.7572
-238.65	0.8681

Nagata, Isamu - Tamura, Kazuhiro - Tokuriki, Shinji, Excess enthalpies and complex formation of acetonitrile with acetone, chloroform, and benzene, Thermochimica Acta. 47 (1981) 315-331. doi:10.1016/0040-6031(81)80110-4

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$	x_1
-55.40	0.0452
-106.20	0.0873
-197.40	0.1701
-234.20	0.2061
-275.20	0.2455
-321.20	0.3030
-357.10	0.3590
-383.70	0.4122
-407.40	0.4902

-415.20	0.5584	0.0319	0.2031
-413.80	0.5620	0.1080	0.2597
-404.70	0.6191	0.4378	0.4162
-385.20	0.6729	0.6590	0.5220
-354.70	0.7236	0.7643	0.6145
-321.40	0.7675	0.7984	0.6981
-276.00	0.8144	0.6698	0.7949
-216.80	0.8642	0.5365	0.8598
-185.10	0.8870	0.3904	0.9228
-151.90	0.9105		
-116.40	0.9319		
-79.50	0.9547		
-40.60	0.9770		

Rastogi, R.P. - Nath, Jagan - Misra, R.R., Thermodynamics of weak interactions in liquid mixtures of chloroform and aromatic hydrocarbons, The Journal of Chemical Thermodynamics. 3 (1971) 307-317. doi:10.1016/S0021-9614(71)80047-2

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
-184.00	0.1533
-267.00	0.2340
-292.00	0.2604
-360.00	0.3371
-400.00	0.4286
-430.00	0.5200
-421.00	0.6009
-418.00	0.6238
-407.00	0.6302
-398.00	0.6693
-318.00	0.7801
-308.00	0.7836
-309.00	0.7940

Heat capacity of mixing

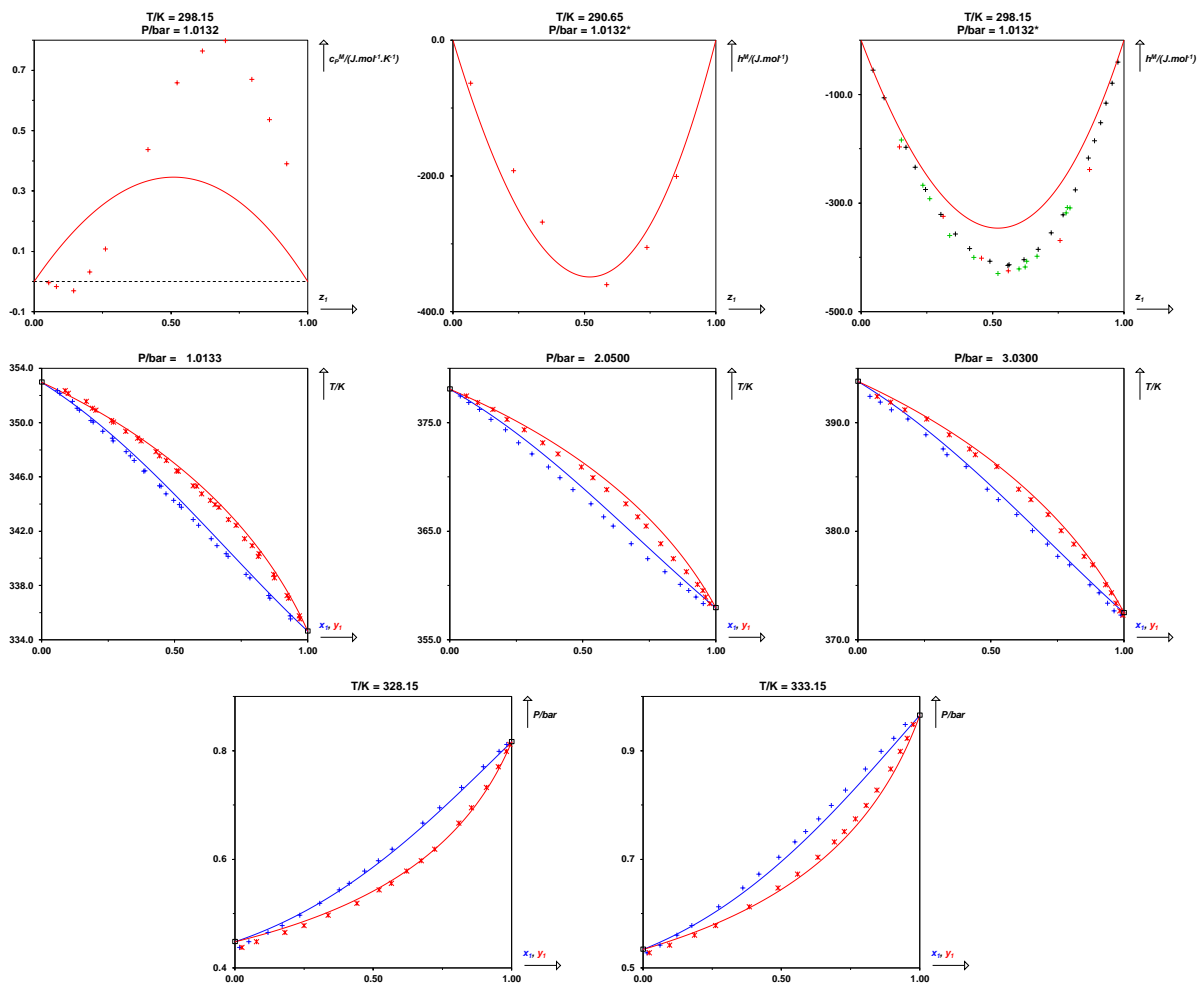
Grolier, Jean-Pierre E. - Roux-Desgranges, Genevieve - Kooner, Zorawar S. - Smith, John F. - Hepler, Loren G., Thermal and volumetric properties of chloroform+benzene mixtures and the ideal associated solution model of complex formation, Journal of Solution Chemistry. 16 (1987) 745-752. doi:10.1007/BF00652577

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.0046	0.0524
-0.0163	0.0806
-0.0306	0.1445

HD-NA systems (BAC = 3)



CHLOROFORM (1) + n-HEXANE (2)

CAS	67-66-3	110-54-3
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	VLKZOEYOYAKHREP-UHFFFAOYSA-N
T_c / K	536.40	507.60
P_c / bar	54.72	30.25
ω	0.222	0.301

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 40.15$

$B/\text{MPa} = 67.54$

Deviations

MAPE on $x = 4.9\%$

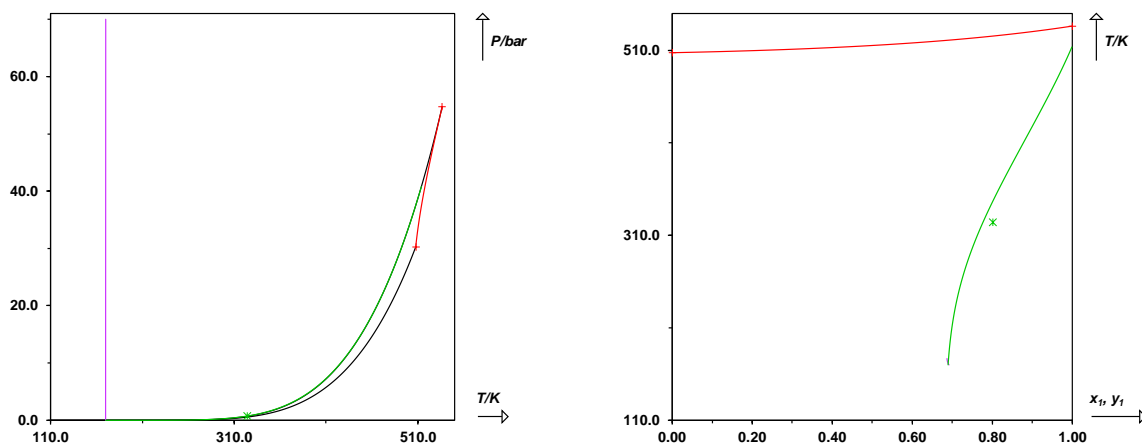
MAPE on $y = 4.1\%$

MAPE on $x_{az} = 7.4\%$

MAPE on $P_{az} = 0.55\%$

MAPE on $h^M = 27\%$

MAPE on $c_p^M = 31\%$



Isothermal phase equilibrium data

Bissell, T.G - Williamson, A.G, Vapour pressures and excess Gibbs energies of n-hexane and of n-heptane + carbon tetrachloride and + chloroform at 298.15 K, The Journal of Chemical Thermodynamics. 7 (1975) 131-136. doi:10.1016/0021-9614(75)90260-8

T / K = 298.15

P / bar	x ₁	y ₁
0.2273	0.1312	0.2230
0.2439	0.2441	0.3579
0.2555	0.3455	0.4538
0.2609	0.4052	0.5030
0.2637	0.4442	0.5331
0.2675	0.5022	0.5755
0.2692	0.5345	0.5984
0.2720	0.6013	0.6445
0.2732	0.6169	0.6552
0.2745	0.7015	0.7140
0.2747	0.7898	0.7799
0.2714	0.8937	0.8717

Kudryavtseva, L.S. - Susarev, M.P., Liquid-vapor equilibrium in systems chloroform-hexane and acetone-chloroform, J. Appl. Chem. USSR. 36 (1963) 1231-1237.

T / K = 308.15

P / bar	x ₁	y ₁
0.3294	0.1005	0.1680
0.3545	0.2005	0.3050
0.3730	0.2885	0.3920
0.3878	0.3954	0.4870
0.4006	0.4977	0.5710
0.4084	0.5993	0.6440
0.4141	0.6981	0.7140
0.4134	0.8000	0.7910
0.4081	0.9009	0.8800

Kudryavtseva, L.S. - Susarev, M.P., Liquid-vapor equilibrium in systems chloroform-hexane and acetone-chloroform, J. Appl. Chem. USSR. 36 (1963) 1231-1237.

T / K = 318.15

P / bar	x ₁	y ₁
0.4866	0.1015	0.1630
0.5218	0.2025	0.3010
0.5458	0.2895	0.3920
0.5666	0.3959	0.4840
0.5860	0.4982	0.5710
0.5952	0.5979	0.6400
0.6028	0.6986	0.7150
0.6046	0.8000	0.7930

0.5992 0.9006 0.8820

Kudryavtseva, L.S. - Susarev, M.P., Liquid-vapor equilibrium in systems chloroform-hexane and acetone-chloroform, J. Appl. Chem. USSR. 36 (1963) 1231-1237.

T / K = 328.15

P / bar	x ₁	y ₁
0.6925	0.1035	0.1610
0.7361	0.2035	0.2960
0.7667	0.2905	0.3850
0.7941	0.3964	0.4840
0.8230	0.4992	0.5690
0.8367	0.5965	0.6400
0.8467	0.6991	0.7200
0.8491	0.8000	0.7940
0.8415	0.9003	0.8830

Isobaric phase equilibrium data

Brzostowski, W. - Verhoeve, L., Thermodynamic properties of mixtures of hexane and chloroform, Roczn. Chem. 42 (1968) 507-515.

P / bar = 0.7519

T / K	x ₁	y ₁
330.55	0.1000	0.1590
329.10	0.2000	0.2890
327.80	0.3000	0.4000
326.70	0.4000	0.4960
325.75	0.5000	0.5810
325.10	0.6000	0.6580
324.65	0.7000	0.7290
324.40	0.8000	0.8010
324.40	0.8015	0.8015
324.50	0.9000	0.8860

AZEO

Kudryavtseva, L.S. - Susarev, M.P., Liquid-vapor equilibrium in systems chloroform-hexane and acetone-chloroform, J. Appl. Chem. USSR. 36 (1963) 1231-1237.

P / bar = 1.013

T / K	x ₁	y ₁
339.68	0.1055	0.1590
337.93	0.2055	0.2920
336.65	0.2915	0.3830
335.47	0.3969	0.4840
334.55	0.4997	0.5660
334.02	0.5937	0.6410
333.62	0.6998	0.7200
333.56	0.8000	0.7960
333.80	0.9001	0.8840

Enthalpy of mixing

Ortega, J. - Placido, J., Excess enthalpies of trichloromethane + n-alkanes. Measurement and comparison with the DISQUAC model, Int. Electron. J. Phys. Chem. Data. 1 (1995) 59-68.

T / K = 298.15
P / bar = UNKNOWN (1.0132)
 $h^M / \text{J.mol}^{-1}$ x_1

153.10 0.0809

355.20 0.1687

473.90 0.2533

605.80 0.3343

687.30 0.4071

726.60 0.4714

746.10 0.5334

739.70 0.5826

722.60 0.6253

697.80 0.6623

657.30 0.7066

602.20 0.7526

527.40 0.7996

440.30 0.8406

338.60 0.8856

225.50 0.9287

113.40 0.9674

Bissell, T.G. - Okafor, G.E. - Williamson, A.G., Enthalpies and volumes of mixing of alkanes with carbon tetrachloride, chloroform, and methylene chloride at 25 °C, The Journal of Chemical Thermodynamics. 3 (1971) 393-399. doi:10.1016/S0021-9614(71)80056-3

T / K = 298.15
P / bar = UNKNOWN (1.0132)
 $h^M / \text{J.mol}^{-1}$ x_1

276.00 0.1060

468.00 0.1920

605.00 0.2810

718.00 0.4100

750.00 0.4960

761.00 0.4990

738.00 0.6030

670.00 0.6980

527.00 0.7950

287.00 0.9070

Sharma, B.R. - Pundeer, G.S. - Singh, P.P., Thermodynamics of weak interactions: excess enthalpies and excess Gibbs free energies of mixing, Thermochemica Acta. 11 (1975) 105-114. doi:10.1016/0040-6031(75)80013-X

T / K = 308.15
P / bar = UNKNOWN (1.0132)
 $h^M / \text{J.mol}^{-1}$ x_1

67.03 0.0598

132.90 0.1102

228.25 0.1803

450.38 0.3499

518.17 0.4201

586.04 0.5800

572.11 0.6297

471.96 0.7502

405.06 0.8001

344.82 0.8398

249.78 0.8903

162.15 0.9299

Heat capacity of mixing

Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 217-237.

T / K = 298.15
P / bar = UNKNOWN (1.0132)
 $cp^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

-1.010 0.1051

-1.690 0.2211

-2.010 0.3138

-2.230 0.4089

-2.230 0.5147

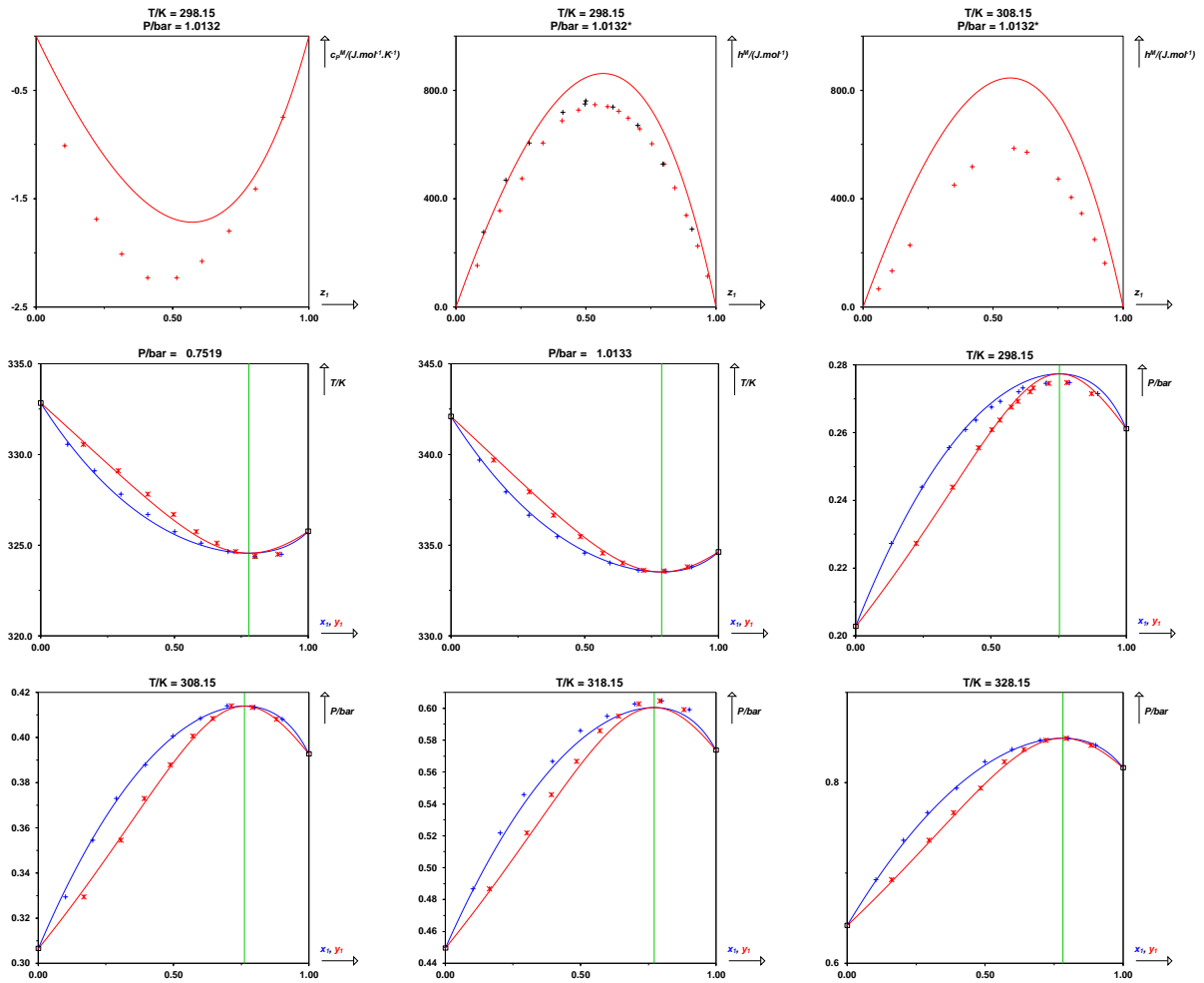
-2.080 0.6083

-1.800 0.7069

-1.410 0.8033

-0.7500 0.9049

HD-NA systems (BAC = 3)



CHLOROFORM (1) + n-HEPTANE (2)

CAS	67-66-3	142-82-5
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	IMNFDFMRHMDMM-UHFFFAOYSA-N
T_c / K	536.40	540.20
P_c / bar	54.72	27.40
ω	0.222	0.349

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 31.15$

$B/\text{MPa} = 58.53$

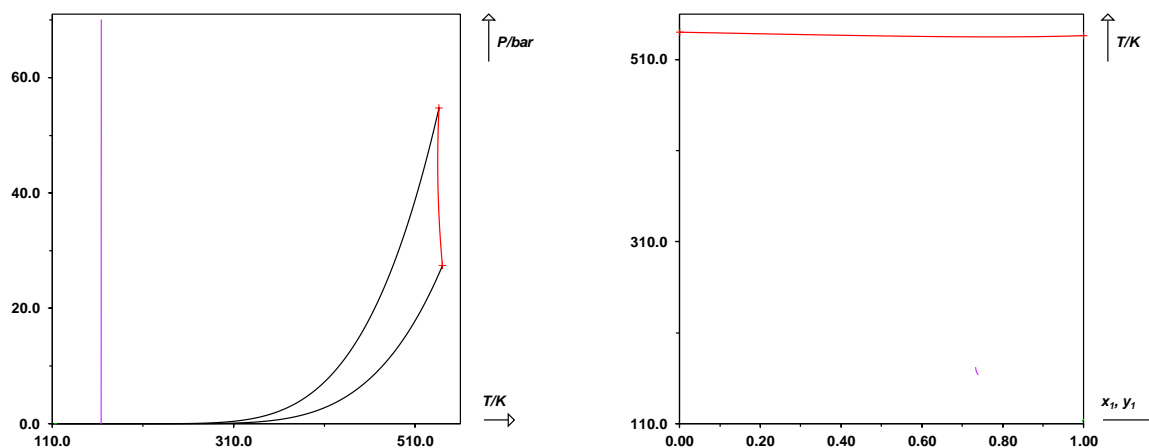
Deviations

MAPE on $x = 5.3\%$

MAPE on $y = 3.9\%$

MAPE on $h^M = 8.9\%$

MAPE on $c_p^M = 20\%$



-----			760.80	0.4338
Isothermal phase equilibrium data			798.90	0.4987
-----			806.70	0.5559
Bissell, T.G - Williamson, A.G, Vapour pressures and excess Gibbs energies of n-hexane and of n-heptane + carbon tetrachloride and + chloroform at 298.15 K, The Journal of Chemical Thermodynamics. 7 (1975) 131-136. doi:10.1016/0021-9614(75)90260-8			793.20	0.6043
T / K = 298.15			767.30	0.6472
P / bar	x_1	y_1	730.40	0.6830
0.0966	0.1142	0.4391	714.60	0.6948
0.1250	0.2181	0.6103	661.40	0.7362
0.1459	0.3047	0.6971	592.10	0.7784
0.1673	0.4045	0.7666	517.90	0.8208
0.1854	0.5011	0.8165	428.40	0.8631
0.1859	0.5019	0.8168	327.60	0.8997
0.2027	0.6003	0.8574	217.00	0.9381
0.2035	0.6058	0.8594	109.10	0.9706
0.2199	0.7105	0.8962	Bissell, T.G. - Okafor, G.E. - Williamson, A.G., Enthalpies and volumes of mixing of alkanes with carbon tetrachloride, chloroform, and methylene chloride at 25 °C, The Journal of Chemical Thermodynamics. 3 (1971) 393-399. doi:10.1016/S0021-9614(71)80056-3	
0.2320	0.7922	0.9233	T / K = 298.15	
0.2455	0.8872	0.9556	P / bar = UNKNOWN (1.0132)	
-----			$h^M / J.mol^{-1}$	x_1
Enthalpy of mixing			280.00	0.1080
-----			421.00	0.1720
Abello, L., Enthalpies d'excès des systèmes binaires constitués d'hydrocarbures benzéniques et du chloroforme ou du methylchloroforme - I. — Résultats expérimentaux, J. Chim. Phys. Phys. Chim. Biol. 70 (1973) 1355-1359. doi:10.1051/jcp/1973701355			563.00	0.2490
T / K = 298.15			743.00	0.3980
P / bar = UNKNOWN (1.0132)			797.00	0.4940
$h^M / J.mol^{-1}$	x_1		792.00	0.5950
449.50	0.1870		708.00	0.7020
604.00	0.2780		570.00	0.7970
737.50	0.4080		481.00	0.8420
803.20	0.5520		328.00	0.9020
736.60	0.6750		Shatas, Joseph P. - Abbott, Michael M. - Van Ness, Hendrick C., Excess thermodynamic functions for ternary systems. II. Chloroform-ethanol-n-heptane at 50°C, Journal of Chemical & Engineering Data. 20 (1975) 406-409. doi:10.1021/je60067a020	
648.40	0.7510		T / K = 323.15	
364.60	0.8905		P / bar = UNKNOWN (1.0132)	
Ortega, J. - Placido, J., Excess enthalpies of trichloromethane + n-alkanes. Measurement and comparison with the DISQUAC model, Int. Electron. J. Phys. Chem. Data. 1 (1995) 59-68.			$h^M / J.mol^{-1}$	x_1
T / K = 298.15			39.90	0.0148
P / bar = UNKNOWN (1.0132)			81.00	0.0303
$h^M / J.mol^{-1}$	x_1		149.30	0.0573
208.20	0.0931		251.60	0.1005
403.40	0.1870		326.80	0.1348
568.20	0.2771		444.30	0.1948
681.60	0.3584		538.20	0.2501
			632.60	0.3181
			702.90	0.3873

763.90	0.4835
772.80	0.5403
765.60	0.5854
757.90	0.6074
721.30	0.6710
702.10	0.6906
663.10	0.7253
620.60	0.7557
567.60	0.7889
481.90	0.8335
391.90	0.8733
292.90	0.9109
252.00	0.9250
187.40	0.9461
131.10	0.9633
80.40	0.9780
46.10	0.9876
11.30	0.9970

Heat capacity of mixing

Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 217-237.

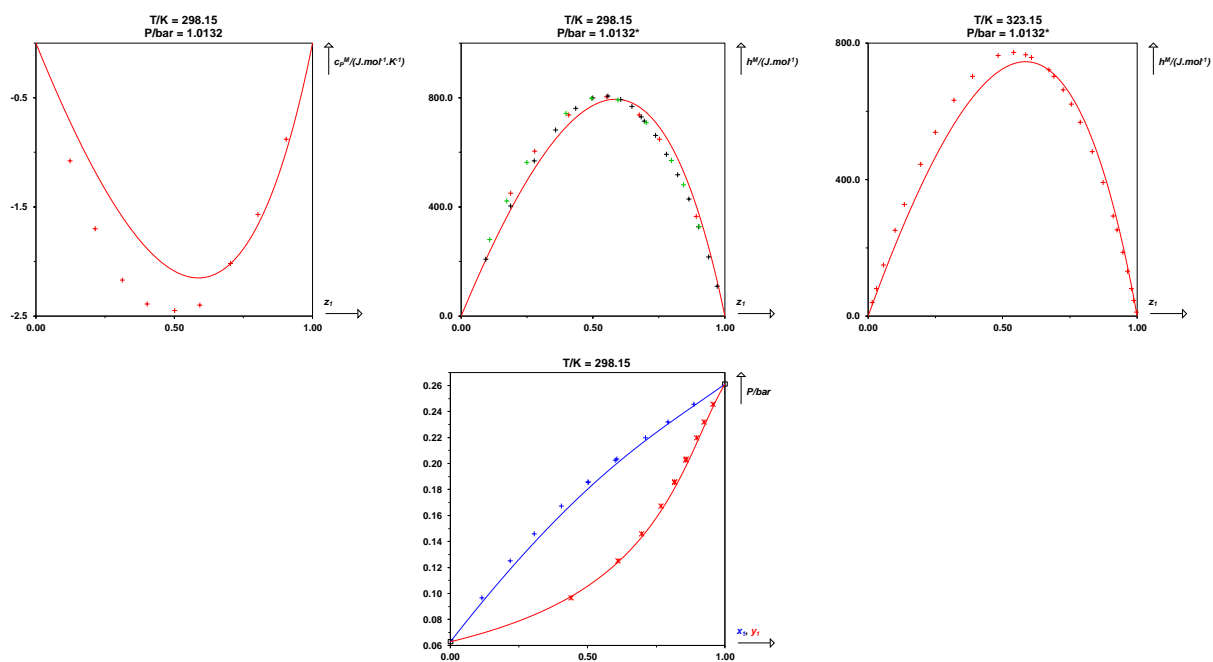
T / K = 298.15

P / bar = UNKNOWN (1.0132)

c_p^M / x_1

J.mol⁻¹.K⁻¹

-1.080	0.1233
-1.700	0.2139
-2.170	0.3126
-2.390	0.4023
-2.450	0.5009
-2.400	0.5923
-2.020	0.7026
-1.570	0.8030
-0.8800	0.9048



CHLOROFORM (1) + 1,2-DICHLOROETHANE (2)

CAS	67-66-3	107-06-2
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	WSLDOOZREJYCGB-UHFFFAOYSA-N
T_c / K	536.40	561.60
P_c / bar	54.72	53.70
ω	0.222	0.287

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 9.945$

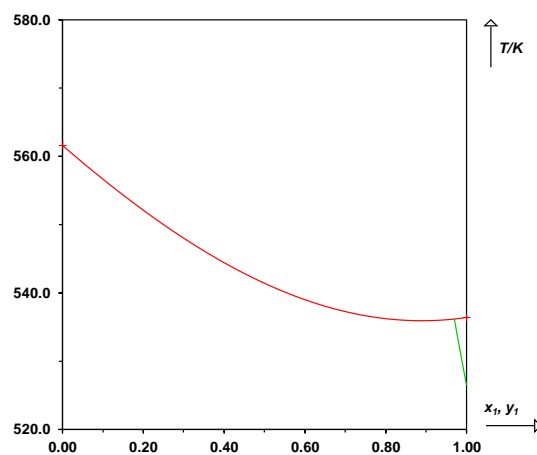
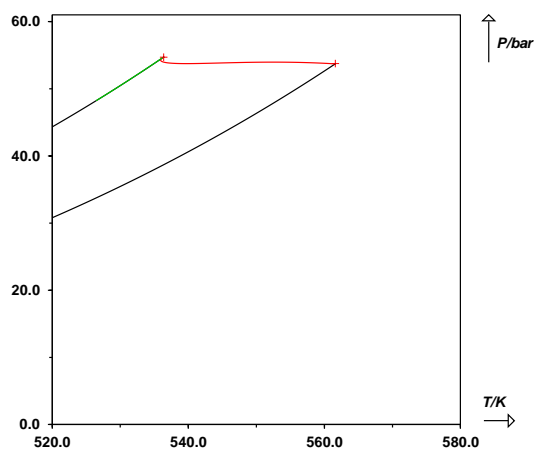
$B/\text{MPa} = -15.06$

Deviations

MAPE on $x = 5.6\%$

MAPE on $y = 6.4\%$

MAPE on $h^M = 8.3\%$



Isothermal phase equilibrium data

Paul, H.I., Experimentelle untersuchung der Flüssigkeits-Dampf-Phasengleichgewichte und Volumetrischen Eigenschaften Binärer und Ternärer Mischungen, VDI Forschungsh. Reihe 3 Verfahrenst. 135 (1987)

T / K = 323.16

P / bar	x ₁	y ₁
0.3245	0.0326	0.0705
0.3482	0.0908	0.1827
0.4063	0.2423	0.4155
0.4387	0.3250	0.5184
0.4430	0.3376	0.5317
0.4659	0.3973	0.5941
0.4696	0.4081	0.6034
0.4927	0.4682	0.6611
0.4955	0.4765	0.6675
0.5170	0.5330	0.7161
0.5269	0.5594	0.7367
0.5608	0.6497	0.8009
0.5919	0.7307	0.8563
0.6230	0.8142	0.9044
0.6532	0.8937	0.9474
0.6795	0.9630	0.9822

Isobaric phase equilibrium data

Al-Hayan, M.N.M - Newsham, D.M.T, Isobaric vapour-liquid equilibria for mixtures containing halogenated hydrocarbons at atmospheric pressure: I. Binary mixtures of trichloromethane+ 1, 2-dichloroethane, 1, 2-dichloroethane+ 1, 1, 2, 2-tetrachloroethane, trichloromethane+ 1, 1, 2, 2-tetrachloroethane and n-heptane+ 1, 1, 2, 2-tetrachloroethane, Fluid Phase Equilibria. 166 (1999) 91-100. doi:10.1016/S0378-3812(99)00297-6

P / bar = 1.013

T / K	x ₁	y ₁
353.90	0.0814	0.1626
350.80	0.1826	0.3239
349.40	0.2352	0.3952
346.70	0.3395	0.5186
344.40	0.4392	0.6192
342.80	0.5171	0.6882
340.00	0.6567	0.7953
337.20	0.8116	0.8956

Enthalpy of mixing

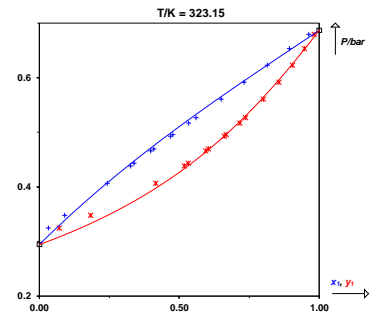
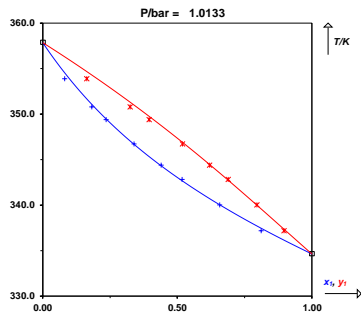
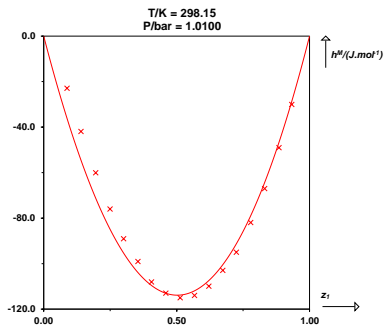
Munoz Embid, J. - Roux, A.H. - Grolier, J.P.E., Excess enthalpy. Trichloromethane - 1,2-dichloroethane system, Int. Data Ser. Sel. Data Mixtures Ser. A. 1990 (1990) 59-78.

T / K = 298.15

P / bar = 1.010

h ^M / J.mol ⁻¹	z ₁
-23.00	0.0869
-42.00	0.1406
-60.00	0.1947
-76.00	0.2489
-89.00	0.3008
-99.00	0.3540
-108.00	0.4058
-113.00	0.4595
-115.00	0.5130
-114.00	0.5664
-110.00	0.6207
-103.00	0.6738
-95.00	0.7240
-82.00	0.7789
-67.00	0.8304
-49.00	0.8853
-30.00	0.9328

HD-NA systems (BAC = 3)



CHLOROFORM (1) + CARBON TETRACHLORIDE (2)

CAS	67-66-3	56-23-5
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	VZGDMQKNWNREIO-UHFFFAOYSA-N
T_c / K	536.40	556.35
P_c / bar	54.72	45.60
ω	0.222	0.193

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 11.34

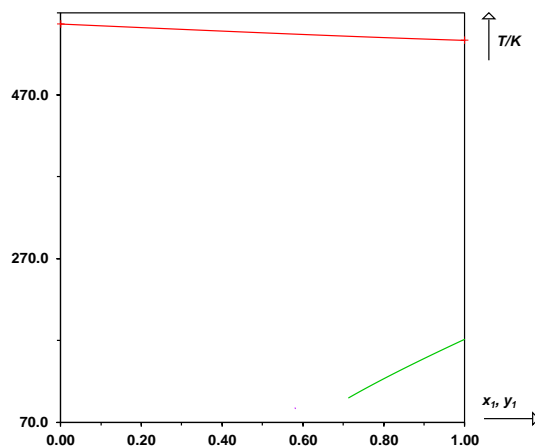
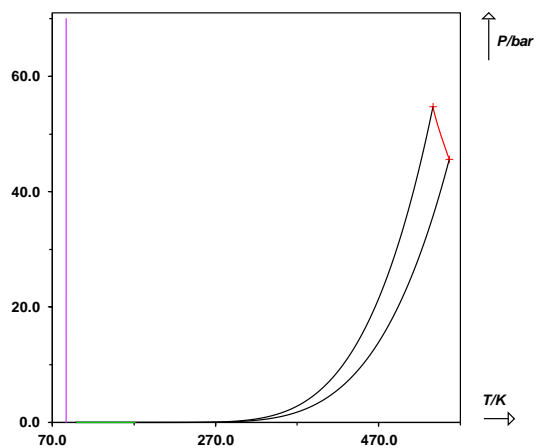
B/MPa = 21.36

Deviations

MAPE on x = 7.6 %

MAPE on y = 8.0 %

MAPE on h^M = 4.8 %



Isothermal phase equilibrium data			

Góral, M. - Oracz, P. - Warycha, S., Vapour—liquid equilibria. IV. The ternary system carbon tetrachloride—methanol—chloroform at 293.15 K, Fluid Phase Equilibria. 44 (1988) 77-93. doi:10.1016/0378-3812(88)80104-3			

T / K = 293.15			
P / bar	x ₁	y ₁	
0.1281	0.0542	0.1040	
0.1358	0.1181	0.2099	
0.1426	0.1780	0.2962	
0.1491	0.2378	0.3726	
0.1549	0.2949	0.4384	
0.1610	0.3576	0.5040	
0.1665	0.4161	0.5602	
0.1716	0.4724	0.6107	
0.1767	0.5329	0.6616	
0.1813	0.5883	0.7058	
0.1869	0.6587	0.7594	
0.1916	0.7198	0.8041	
0.1951	0.7630	0.8350	
0.2004	0.8400	0.8890	
0.2053	0.9125	0.9393	
0.2086	0.9617	0.9733	

Rulewicz, G. - Schuberth, H. - Leibnitz, E., Untersuchungen über das Dampf-Flüssigkeits-Phasengleichgewicht des Systems Methylenchlorid/Chloroform/Tetrachlorkohlenstoff bei 45°C unter Verwendung einer gaschromatographischen Analysenmethode, Journal für Praktische Chemie. 37 (1968) 122-136. doi:10.1002/prac.19680370303

T / K = 318.15			
P / bar	x ₁	y ₁	
0.3530	0.0250	0.0460	
0.3610	0.0500	0.0880	
0.3766	0.1000	0.1690	
0.3920	0.1500	0.2440	
0.4060	0.2000	0.3120	
0.4192	0.2500	0.3740	
0.4324	0.3000	0.4320	
0.4448	0.3500	0.4900	
0.4564	0.4000	0.5390	
0.4684	0.4500	0.5870	
0.4796	0.5000	0.6300	
0.4910	0.5500	0.6740	
0.5021	0.6000	0.7140	
0.5125	0.6500	0.7550	
0.5226	0.7000	0.7920	
0.5320	0.7500	0.8290	

0.5410	0.8000	0.8640
0.5502	0.8500	0.8990
0.5596	0.9000	0.9330
0.5630	0.9200	0.9470
0.5689	0.9500	0.9650
0.5724	0.9700	0.9790

Isobaric phase equilibrium data

Krauze, R. - Serwinski, M., Liquid-vapor equilibrium in the system chloroform-carbon tetrachloride, Zesz. Nauk. Politech. Lodz. Chem. 24 (1973) 53-63.

P / bar = 0.9959			
T / K	x ₁	y ₁	
346.85	0.0950	0.1600	
345.15	0.1710	0.2690	
344.65	0.2030	0.3070	
342.75	0.2970	0.4170	
340.35	0.4480	0.5690	
338.05	0.6170	0.7190	
336.15	0.7650	0.8330	
335.25	0.8510	0.9000	

Enthalpy of mixing

Siddiqi, M.A. - Lucas, K., Excess enthalpy of the system chloroform + carbon tetrachloride and a thermodynamic evaluation of its state dependence, Fluid Phase Equilibria. 16 (1984) 87-98. doi:10.1016/0378-3812(84)85023-2

T / K = 283.15			
P / bar = UNKNOWN (1.0132)			
h ^M / J.mol ⁻¹	x ₁		
134.90	0.1750		
190.30	0.2850		
223.30	0.3920		
229.80	0.4440		
233.00	0.4950		
232.50	0.5450		
224.40	0.5940		
199.70	0.6900		
182.40	0.7370		
133.60	0.8270		

Siddiqi, M.A. - Lucas, K., Excess enthalpy of the system chloroform + carbon tetrachloride and a thermodynamic evaluation of its state dependence, Fluid Phase Equilibria. 16 (1984) 87-98. doi:10.1016/0378-3812(84)85023-2

T / K = 303.15			
P / bar = UNKNOWN (1.0132)			

$h^M / \text{J.mol}^{-1}$	x_1
135.20	0.1750
190.50	0.2850
222.70	0.3920
230.90	0.4440
233.00	0.4950
230.90	0.5450
223.90	0.5940
199.70	0.6900
181.20	0.7370
133.60	0.8270

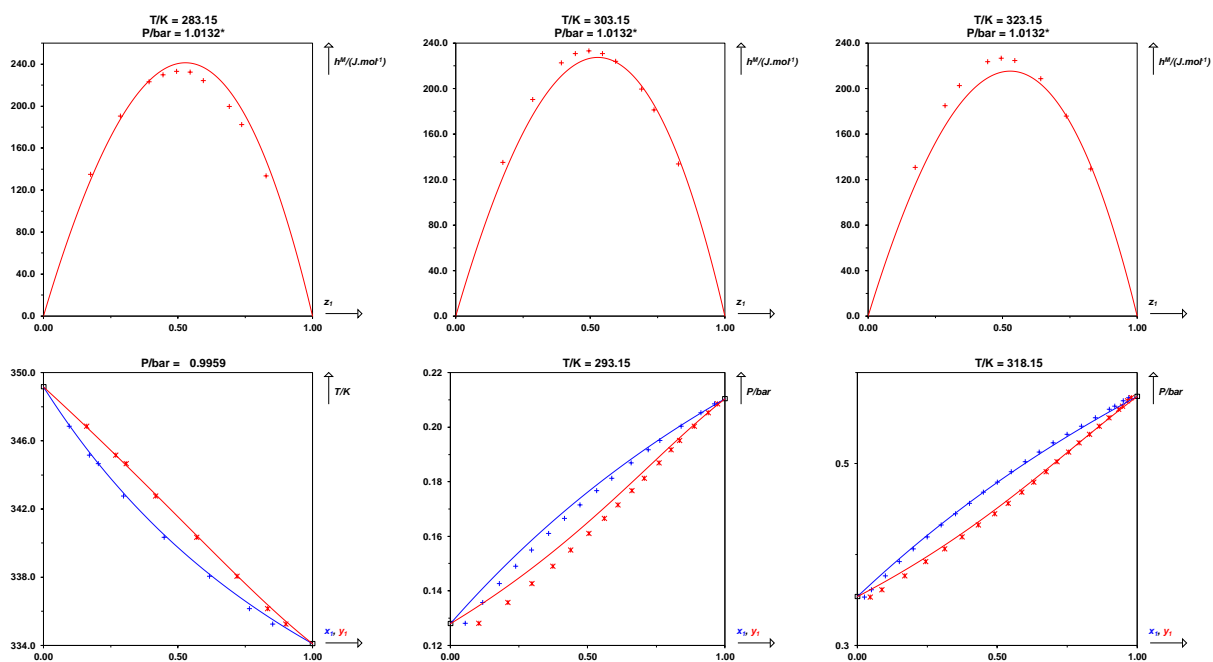
Siddiqi, M.A. - Lucas, K., Excess enthalpy of the system chloroform + carbon tetrachloride and a thermodynamic evaluation of its state dependence, Fluid Phase Equilibria. 16 (1984) 87-98. doi:10.1016/0378-3812(84)85023-2

T / K = 323.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
130.70	0.1750
185.10	0.2850
202.70	0.3390
223.70	0.4440
226.60	0.4950
224.60	0.5450
208.70	0.6420
175.80	0.7370
129.50	0.8270

HD-NA systems (BAC = 3)



1,1,1-TRIFLUOROETHANE (1) + 2,3,3,3-TETRAFLUOROPROPENE (2)

CAS	420-46-2	754-12-1
InChiKey	UJPMYEOUBPIPHQ-UHFFFAOYSA-N	FXRLMCRCYDHQFW-UHFFFAOYSA-N
T_c / K	345.88	367.85
P_c / bar	37.64	33.82
ω	0.261	0.282

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

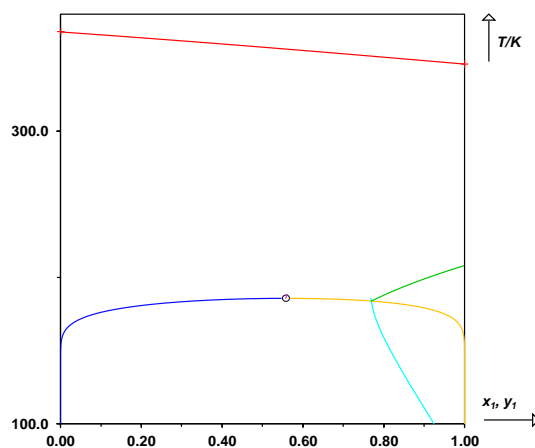
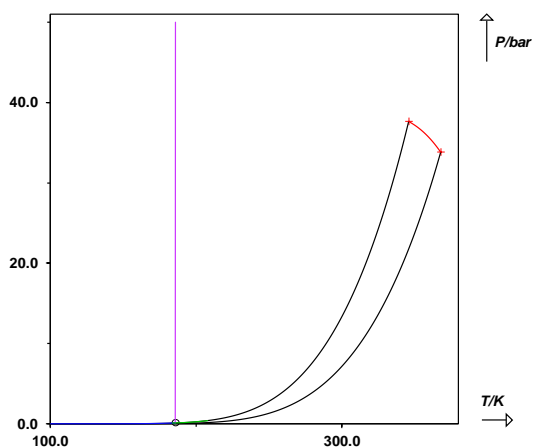
$A/\text{MPa} = 5.323$

$B/\text{MPa} = 36.74$

Deviations

MAPE on $x = 2.2\%$

MAPE on $y = 2.7\%$



Isothermal phase equilibrium data

Hu, Peng - Chen, Long-Xiang - Chen, Ze-Shao, Vapor-liquid equilibria for the 1,1,1,2-tetrafluoroethane (HFC-134a)+1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea) and 1,1,1-trifluoroethane (HFC-143a)+2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) systems, Fluid Phase Equilibria. 360 (2013) 293-297. doi:10.1016/j.fluid.2013.09.056

T / K = 283.15

P / bar	x_1	y_1
4.726	0.0809	0.1338
5.246	0.2022	0.3134
5.913	0.3656	0.4991
6.423	0.4954	0.6266
7.167	0.6858	0.7875
7.533	0.7799	0.8551
7.747	0.8390	0.8975

Hu, Peng - Chen, Long-Xiang - Chen, Ze-Shao, Vapor-liquid equilibria for the 1,1,1,2-tetrafluoroethane (HFC-134a)+1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea) and 1,1,1-trifluoroethane (HFC-143a)+2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) systems, Fluid Phase Equilibria. 360 (2013) 293-297. doi:10.1016/j.fluid.2013.09.056

T / K = 293.15

P / bar	x_1	y_1
6.356	0.0809	0.1299
7.024	0.2022	0.3029
7.873	0.3656	0.4905
8.536	0.4954	0.6172
9.500	0.6858	0.7802
9.963	0.7799	0.8497
10.25	0.8390	0.8938

Hu, Peng - Chen, Long-Xiang - Chen, Ze-Shao, Vapor-liquid equilibria for the 1,1,1,2-tetrafluoroethane (HFC-134a)+1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea) and 1,1,1-trifluoroethane (HFC-143a)+2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) systems, Fluid Phase Equilibria. 360 (2013) 293-297. doi:10.1016/j.fluid.2013.09.056

T / K = 303.15

P / bar	x_1	y_1
8.428	0.0809	0.1258
9.215	0.2022	0.2933
10.28	0.3656	0.4812
11.11	0.4954	0.6071
12.33	0.6858	0.7718
12.93	0.7799	0.8438
13.24	0.8390	0.8880

Hu, Peng - Chen, Long-Xiang - Chen, Ze-Shao, Vapor-liquid equilibria for the 1,1,1,2-tetrafluoroethane (HFC-134a)+1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea) and 1,1,1-trifluoroethane (HFC-143a)+2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) systems, Fluid Phase Equilibria. 360 (2013) 293-297. doi:10.1016/j.fluid.2013.09.056

T / K = 313.15

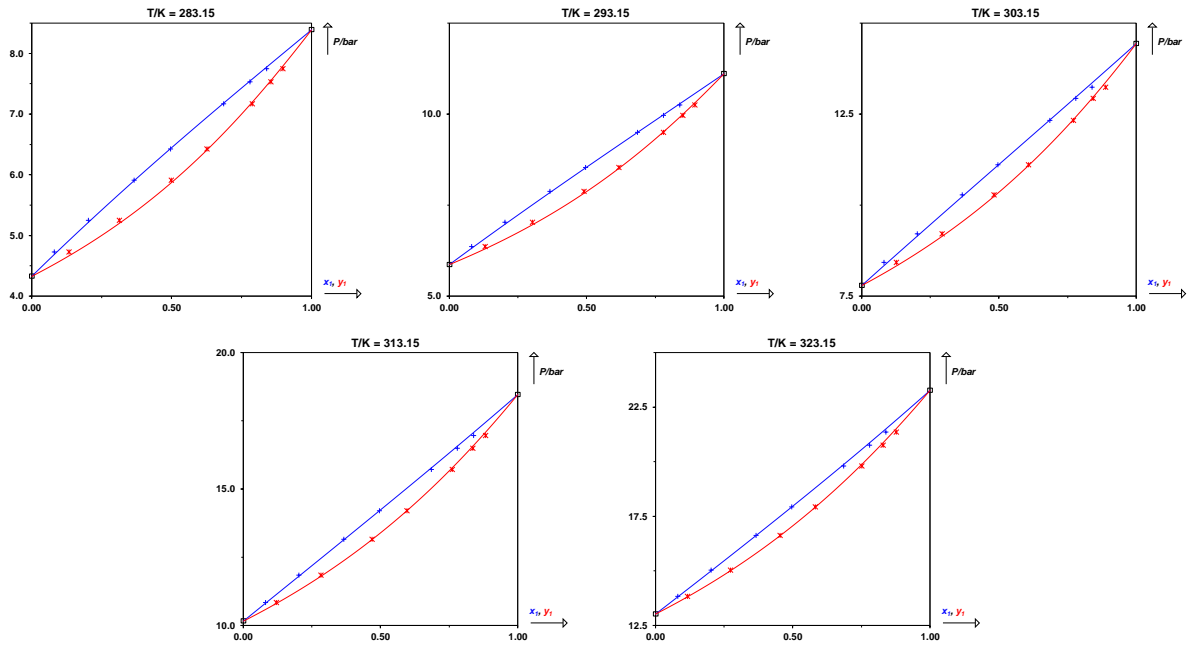
P / bar	x_1	y_1
10.84	0.0809	0.1204
11.85	0.2022	0.2821
13.16	0.3656	0.4684
14.20	0.4954	0.5958
15.72	0.6858	0.7617
16.49	0.7799	0.8365
16.96	0.8390	0.8825

Hu, Peng - Chen, Long-Xiang - Chen, Ze-Shao, Vapor-liquid equilibria for the 1,1,1,2-tetrafluoroethane (HFC-134a)+1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea) and 1,1,1-trifluoroethane (HFC-143a)+2,3,3,3-tetrafluoroprop-1-ene (HFO-1234yf) systems, Fluid Phase Equilibria. 360 (2013) 293-297. doi:10.1016/j.fluid.2013.09.056

T / K = 323.15

P / bar	x_1	y_1
13.82	0.0809	0.1158
15.03	0.2022	0.2722
16.63	0.3656	0.4540
17.93	0.4954	0.5820
19.79	0.6858	0.7518
20.76	0.7799	0.8287
21.37	0.8390	0.8770

HD-NA systems (BAC = 3)



PENTAFLUOROETHANE (1) + PROPANE (2)

CAS	354-33-6	74-98-6
InChiKey	GTLACDSXYULKMZ-UHFFFAOYSA-N	ATUOYWVHWRKTHZ-UHFFFAOYSA-N
T_c / K	339.17	369.83
P_c / bar	36.20	42.48
ω	0.305	0.152

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results
Parameters

$$A/\text{MPa} = 100.7$$

$$B/\text{MPa} = 168.0$$

Deviations

$$\text{MAPE on } x = 2.8 \%$$

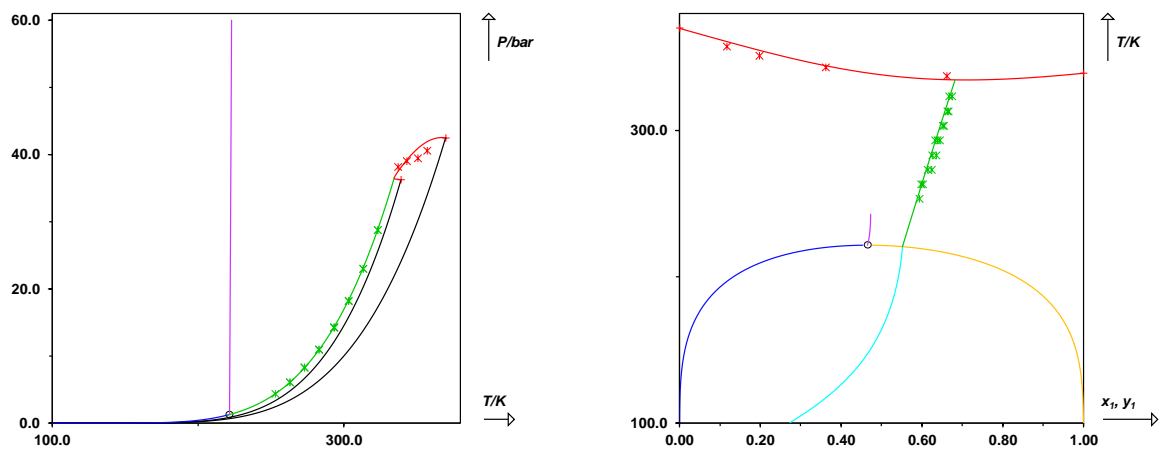
$$\text{MAPE on } y = 2.0 \%$$

$$\text{MAPE on } x_c = 19 \%$$

$$\text{MAPE on } P_c = 2.4 \%$$

$$\text{MAPE on } x_{az} = 1.3 \%$$

$$\text{MAPE on } P_{az} = 0.28 \%$$



Isothermal phase equilibrium data					
-----			5.314	0.1763	0.4182
Isothermal phase equilibrium data			5.757	0.2804	0.4918
-----			5.969	0.3819	0.5182
Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1			6.054	0.4810	0.5537
T / K = 253.15			6.065	0.5878	0.6052
P / bar	x ₁	y ₁	6.107	0.5979	0.5979
3.022	0.0450	0.2010	6.066	0.6635	0.6333
3.168	0.0630	0.2520	5.806	0.8549	0.7418
3.625	0.1410	0.3870	5.376	0.9360	0.8568
3.886	0.1920	0.4470	Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1		
4.097	0.2770	0.4880	T / K = 273.15		
4.301	0.4050	0.5370	P / bar	x ₁	y ₁
4.351	0.5130	0.5670	5.630	0.0450	0.1750
4.349	0.5940	0.5940	5.888	0.0600	0.2100
4.348	0.6860	0.6300	6.215	0.0880	0.2680
4.267	0.7690	0.6750	6.674	0.1300	0.3370
4.196	0.8070	0.7020	7.184	0.1860	0.3980
3.965	0.8970	0.7950	7.603	0.2730	0.4600
Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor-liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1			8.166	0.4780	0.5570
T / K = 263.15			8.203	0.5130	0.5640
P / bar	x ₁	y ₁	8.261	0.5710	0.5940
4.175	0.0460	0.1910	8.253	0.6140	0.6140
4.376	0.0600	0.2280	8.228	0.6810	0.6450
4.681	0.0910	0.2970	8.094	0.7710	0.7030
4.985	0.1270	0.3530	7.976	0.8170	0.7410
5.312	0.1780	0.4130	7.594	0.8980	0.8270
5.827	0.3160	0.4980	Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R., Hydrogen-bonding of HFCs with dimethyl ether: evaluation by isothermal VLE measurements, Fluid Phase Equilibria. 199 (2002) 153-160. doi:10.1016/S0378-3812(01)00813-5		
5.944	0.3840	0.5280	T / K = 273.15		
6.053	0.5150	0.5710	P / bar	x ₁	y ₁
6.092	0.6030	0.6030	5.189	0.0208	0.0913
6.095	0.6180	0.6120	5.811	0.0564	0.2039
5.946	0.7720	0.6910	6.410	0.1013	0.2941
5.864	0.8180	0.7260	7.197	0.1941	0.4028
5.555	0.8970	0.8130	7.670	0.2896	0.4676
Hou, Shu-Xin - Duan, Yuan-Yuan, Isothermal vapor-liquid equilibria for the pentafluoroethane+propane and pentafluoroethane+1,1,1,2,3,3,3-heptafluoropropane systems, Fluid Phase Equilibria. 290 (2010) 121-126. doi:10.1016/j.fluid.2009.09.008			8.064	0.4395	0.5403
T / K = 263.15			8.183	0.7081	0.6652
P / bar	x ₁	y ₁	8.153	0.7324	0.6796
4.322	0.0538	0.2184	8.037	0.7899	0.7188
			7.632	0.8906	0.8146

Lim, Jong Sung - Park, Ji Young - Lee, Kab-Soo - Kim, Jae-Duck - Lee, Byung Gwon, Measurement of Vapor–Liquid Equilibria for the Binary Mixture of Pentafluoroethane (HFC-125) + Propane (R-290), Journal of Chemical & Engineering Data. 49 (2004) 750-755. doi:10.1021/je030156p

T / K = 273.15		
P / bar	x_1	y_1
6.920	0.1660	0.3670
7.682	0.3080	0.4750
8.208	0.5060	0.5720
8.271	0.6247	0.6247
8.284	0.6790	0.6280
7.864	0.8540	0.7630

Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor–liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1

T / K = 283.15		
P / bar	x_1	y_1
7.202	0.0340	0.1230
7.446	0.0460	0.1570
7.962	0.0740	0.2240
8.828	0.1300	0.3150
9.244	0.1710	0.3670
9.857	0.2470	0.4300
10.48	0.3830	0.5090
10.80	0.4760	0.5530
10.87	0.5090	0.5670
10.95	0.5710	0.6020
10.96	0.6250	0.6250
10.92	0.6970	0.6660
10.78	0.7660	0.7150
10.61	0.8190	0.7550
10.17	0.8980	0.8360

Lim, Jong Sung - Park, Ji Young - Lee, Kab-Soo - Kim, Jae-Duck - Lee, Byung Gwon, Measurement of Vapor–Liquid Equilibria for the Binary Mixture of Pentafluoroethane (HFC-125) + Propane (R-290), Journal of Chemical & Engineering Data. 49 (2004) 750-755. doi:10.1021/je030156p

T / K = 283.15		
P / bar	x_1	y_1
8.904	0.1380	0.3280
10.20	0.3090	0.4700
10.89	0.5420	0.5830
10.92	0.6352	0.6352
10.87	0.7170	0.6680
10.49	0.8300	0.7670

Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor–liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1

T / K = 293.15		
P / bar	x_1	y_1
9.299	0.0310	0.1020
9.692	0.0520	0.1560
10.24	0.0740	0.2060
11.29	0.1340	0.3000
12.68	0.2510	0.4170
13.53	0.3780	0.4990
14.01	0.4780	0.5510
14.24	0.5700	0.6010
14.24	0.6380	0.6380
14.32	0.6490	0.6460
14.22	0.7010	0.6800
14.05	0.7730	0.7320
13.84	0.8190	0.7680
13.31	0.8990	0.8510

Hou, Shu-Xin - Duan, Yuan-Yuan, Isothermal vapor–liquid equilibria for the pentafluoroethane+propane and pentafluoroethane+1,1,1,2,3,3,3-heptafluoropropane systems, Fluid Phase Equilibria. 290 (2010) 121-126. doi:10.1016/j.fluid.2009.09.008

T / K = 293.15		
P / bar	x_1	y_1
9.515	0.0425	0.1278
10.34	0.0757	0.2022
12.17	0.1973	0.3749
13.02	0.2843	0.4427
14.25	0.6063	0.6229
14.25	0.6328	0.6328
14.27	0.6513	0.6520
14.17	0.7419	0.7122
13.60	0.8646	0.8211
12.81	0.9519	0.9237

Lim, Jong Sung - Park, Ji Young - Lee, Kab-Soo - Kim, Jae-Duck - Lee, Byung Gwon, Measurement of Vapor–Liquid Equilibria for the Binary Mixture of Pentafluoroethane (HFC-125) + Propane (R-290), Journal of Chemical & Engineering Data. 49 (2004) 750-755. doi:10.1021/je030156p

T / K = 293.15		
P / bar	x_1	y_1
11.20	0.1450	0.3100
13.28	0.3290	0.4730
14.08	0.5110	0.5660

HD-NA systems (BAC = 3)

14.19	0.6440	0.6440	AZEO	Engineering Data.	49	(2004)	750-755.
14.20	0.6740	0.6560		doi:10.1021/je030156p			
13.70	0.8310	0.7740		T / K = 303.15			
				P / bar	x_1	y_1	
				14.32	0.1400	0.2910	
				16.78	0.3290	0.4570	
				17.97	0.5180	0.5700	
				18.14	0.6545	0.6545	AZEO
				18.13	0.6960	0.6850	
				17.57	0.8320	0.7860	
Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor–liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1 T / K = 303.15 P / bar x_1 y_1 11.86 0.0310 0.0940 12.65 0.0560 0.1530 14.18 0.1330 0.2790 14.97 0.1740 0.3260 15.96 0.2470 0.4000 17.13 0.3680 0.4800 17.85 0.4760 0.5430 18.18 0.5690 0.5980 18.27 0.6470 0.6500 18.20 0.6510 0.6510 AZEO 18.20 0.7170 0.7010 17.99 0.7750 0.7440 17.74 0.8200 0.7810 17.09 0.8990 0.8640				Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor–liquid equilibria for pentafluoroethane + propane and difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1 T / K = 313.15 P / bar x_1 y_1 15.38 0.0460 0.1170 15.87 0.0610 0.1500 17.52 0.1180 0.2440 18.27 0.1540 0.2870 19.71 0.2330 0.3640 20.26 0.2710 0.3960 21.43 0.3630 0.4640 22.44 0.4680 0.5300 22.65 0.5060 0.5540 22.94 0.5670 0.5980 23.00 0.6630 0.6630 AZEO 23.02 0.7000 0.6900 22.94 0.7250 0.7090 22.78 0.7810 0.7580 22.47 0.8230 0.7930 21.70 0.9030 0.8780			
Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R., Hydrogen-bonding of HFCs with dimethyl ether: evaluation by isothermal VLE measurements, Fluid Phase Equilibria. 199 (2002) 153-160. doi:10.1016/S0378-3812(01)00813-5 T / K = 303.15 P / bar x_1 y_1 12.01 0.0349 0.1091 13.47 0.0876 0.2208 15.07 0.1707 0.3306 16.55 0.2887 0.4313 17.48 0.4069 0.5060 17.99 0.5034 0.5647 18.08 0.5384 0.5838 18.13 0.5568 0.5945 18.17 0.5752 0.6053 18.19 0.5850 0.6097 18.23 0.6718 0.6644 17.99 0.7783 0.7421 17.40 0.8680 0.8241 16.51 0.9480 0.9169				Lim, Jong Sung - Park, Ji Young - Lee, Kab-Soo - Kim, Jae-Duck - Lee, Byung Gwon, Measurement of Vapor–Liquid Equilibria for the Binary Mixture of Pentafluoroethane (HFC-125) + Propane (R-290), Journal of Chemical & Engineering Data. 49 (2004) 750-755. doi:10.1021/je030156p T / K = 313.15 P / bar x_1 y_1 17.89 0.1440 0.2800 21.13 0.3380 0.4490 22.67 0.5220 0.5700 22.92 0.6664 0.6664 AZEO 22.92 0.7030 0.6950 22.40 0.8130 0.7820			
Lim, Jong Sung - Park, Ji Young - Lee, Kab-Soo - Kim, Jae-Duck - Lee, Byung Gwon, Measurement of Vapor–Liquid Equilibria for the Binary Mixture of Pentafluoroethane (HFC-125) + Propane (R-290), Journal of Chemical &				Engineering Data. 49 (2004) 750-755. doi:10.1021/je030156p T / K = 313.15 P / bar x_1 y_1 17.89 0.1440 0.2800 21.13 0.3380 0.4490 22.67 0.5220 0.5700 22.92 0.6664 0.6664 AZEO 22.92 0.7030 0.6950 22.40 0.8130 0.7820			
Engineering Data. 49 (2004) 750-755. doi:10.1021/je030156p T / K = 313.15 P / bar x_1 y_1 17.89 0.1440 0.2800 21.13 0.3380 0.4490 22.67 0.5220 0.5700 22.92 0.6664 0.6664 AZEO 22.92 0.7030 0.6950 22.40 0.8130 0.7820				Kim, Ju Hyok - Kim, Min Soo - Kim, Youngil, Vapor–liquid equilibria for pentafluoroethane + propane and			

difluoromethane + propane systems over a temperature range from 253.15 to 323.15 K, Fluid Phase Equilibria. 211 (2003) 273-287. doi:10.1016/S0378-3812(03)00237-1

T / K = 323.15

P / bar	x_1	y_1	
19.47	0.0550	0.1250	
22.34	0.1490	0.2630	
24.26	0.2250	0.3380	
26.32	0.3480	0.4400	
27.79	0.4660	0.5220	
28.53	0.5640	0.5920	
28.72	0.6740	0.6740	AZEO
28.73	0.7020	0.6990	
28.47	0.7820	0.7700	
28.08	0.8230	0.8040	
27.22	0.8990	0.8820	

Hou, Shu-Xin - Duan, Yuan-Yuan, Isothermal vapor–liquid equilibria for the pentafluoroethane+propane and pentafluoroethane+1,1,1,2,3,3,3-heptafluoropropane systems, Fluid Phase Equilibria. 290 (2010) 121-126. doi:10.1016/j.fluid.2009.09.008

T / K = 323.15

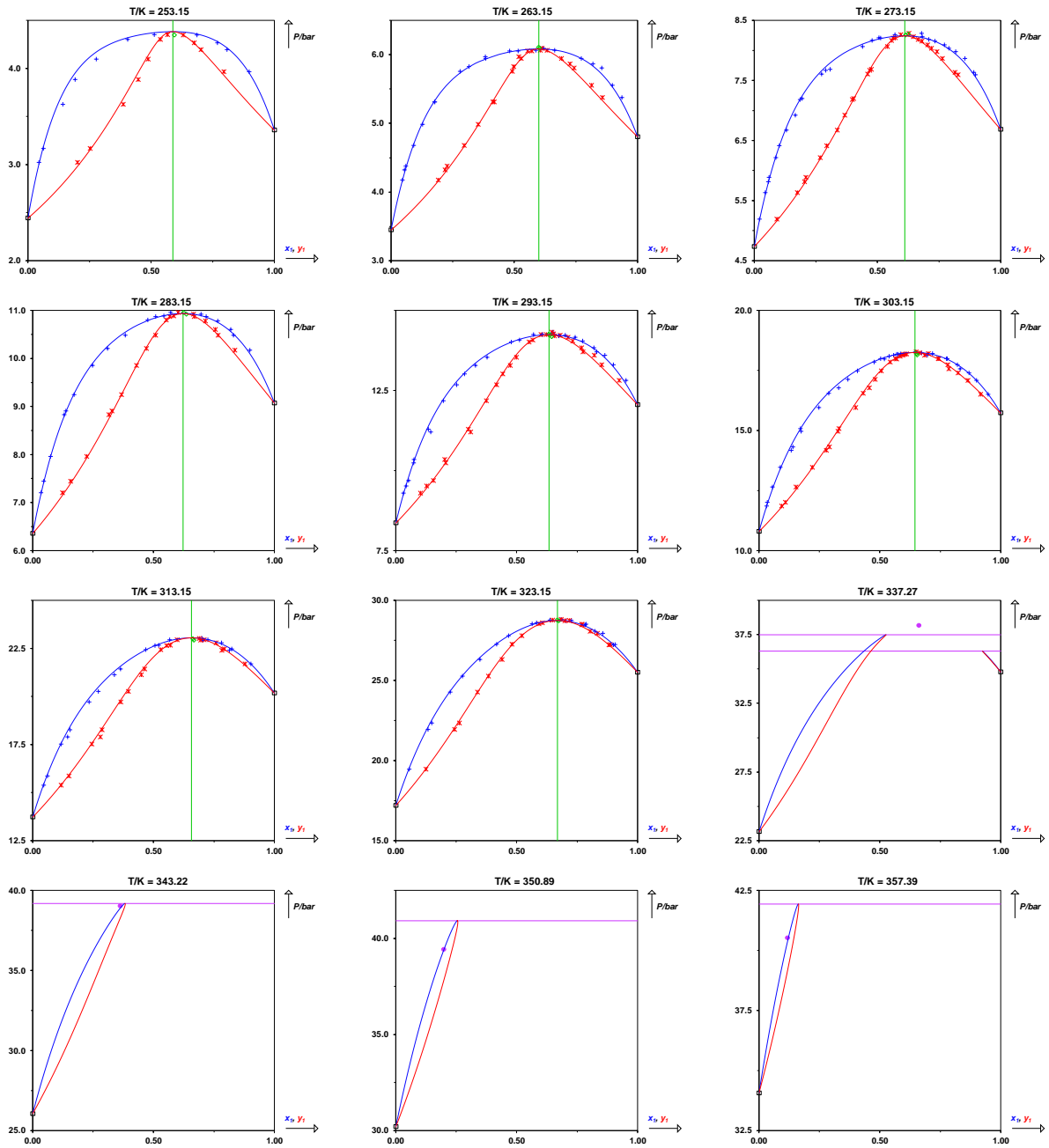
P / bar	x_1	y_1	
21.94	0.1333	0.2427	
25.28	0.2762	0.3827	
27.26	0.4170	0.4809	
28.59	0.5823	0.6064	
28.77	0.6378	0.6484	
28.77	0.6674	0.6674	AZEO
28.81	0.6833	0.6835	
28.75	0.7264	0.7179	
28.50	0.7871	0.7692	
27.93	0.8555	0.8337	
27.24	0.9072	0.8873	

Critical point

Van Poolen, Lambert J. - Holcomb, Cynthia D. - Rainwater, James C., Isoplethic Method to Estimate Critical Lines for Binary Fluid Mixtures from Subcritical Vapor–Liquid Equilibrium: Application to the Azeotropic Mixtures R32 + C3H8 and R125 + C3H8, Industrial & Engineering Chemistry Research. 40 (2001) 4610-4614. doi:10.1021/ie010215x

T / K	P / bar	x_1
337.27	38.17	0.6609
343.22	39.03	0.3615
350.89	39.42	0.1974
357.39	40.51	0.1174

HD-NA systems (BAC = 3)



DECAFLUOROBUTANE (1) + 1,1,1,3,3-PENTAFLUOROBUTANE (2)

CAS	355-25-9	406-58-6
InChiKey	KAVGMUDTWQVPDF-UHFFFAOYSA-N	WZLFPVPRZGTCKP-UHFFFAOYSA-N
T_c / K	386.35	473.70
P_c / bar	23.23	33.92
ω	0.366	0.257

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

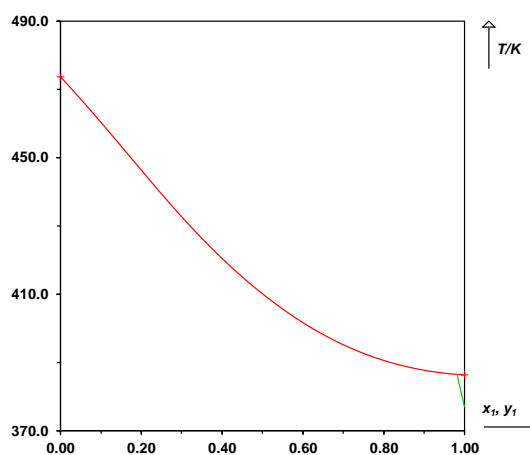
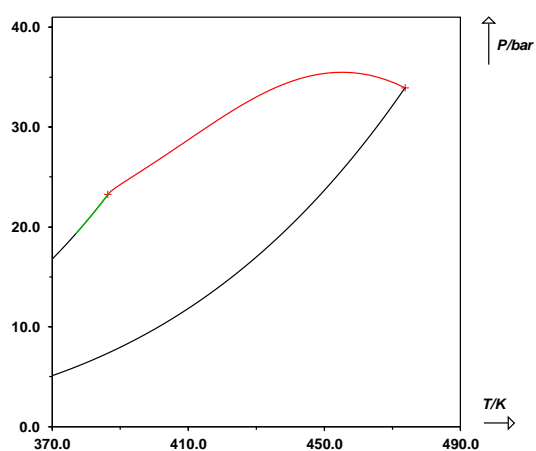
$A/\text{MPa} = 57.03$

$B/\text{MPa} = -13.07$

Deviations

MAPE on $x = 9.2\%$

MAPE on $y = 20\%$



Isothermal phase equilibrium data

Madani, Hakim - Valtz, Alain - Coquelet, Christophe, Isothermal vapor–liquid equilibrium data for the decafluorobutane (R3110)+1,1,1,3,3-pentafluorobutane (R365mfc) system at temperatures from 333K to 441K, Fluid Phase Equilibria. 354 (2013) 109-113. doi:10.1016/j.fluid.2013.06.031

T / K = 333.26

P / bar	x_1	y_1
3.864	0.1082	0.4780
4.303	0.1487	0.5396
4.802	0.2070	0.6000
5.203	0.2690	0.6310
5.691	0.3682	0.6870
6.125	0.4720	0.7310
6.515	0.6100	0.7780

Madani, Hakim - Valtz, Alain - Coquelet, Christophe, Isothermal vapor–liquid equilibrium data for the decafluorobutane (R3110)+1,1,1,3,3-pentafluorobutane (R365mfc) system at temperatures from 333K to 441K, Fluid Phase Equilibria. 354 (2013) 109-113. doi:10.1016/j.fluid.2013.06.031

T / K = 353.34

P / bar	x_1	y_1
5.096	0.0566	0.2760
5.470	0.0736	0.3320
6.204	0.1130	0.4239
6.970	0.1630	0.4940
7.972	0.2450	0.5740
8.948	0.3590	0.6455
9.360	0.4240	0.6726
10.06	0.5430	0.7250

Madani, Hakim - Valtz, Alain - Coquelet, Christophe, Isothermal vapor–liquid equilibrium data for the decafluorobutane (R3110)+1,1,1,3,3-pentafluorobutane (R365mfc) system at temperatures from 333K to 441K, Fluid Phase Equilibria. 354 (2013) 109-113. doi:10.1016/j.fluid.2013.06.031

T / K = 373.71

P / bar	x_1	y_1
7.822	0.0526	0.2000
10.05	0.1370	0.3653
11.26	0.2028	0.4705
13.10	0.3294	0.5737
13.96	0.4050	0.6120
15.03	0.5150	0.6690
15.90	0.6160	0.7260
16.82	0.7420	0.7990

Madani, Hakim - Valtz, Alain - Coquelet, Christophe, Isothermal vapor–liquid equilibrium data for the decafluorobutane (R3110)+1,1,1,3,3-pentafluorobutane (R365mfc) system at temperatures from 333K to 441K, Fluid Phase Equilibria. 354 (2013) 109-113. doi:10.1016/j.fluid.2013.06.031

T / K = 393.64

P / bar	x_1	y_1
10.61	0.0257	0.0816
12.08	0.0698	0.2040
16.93	0.2365	0.4420
18.12	0.2949	0.4880
18.64	0.3188	0.5046
19.51	0.3693	0.5351
20.10	0.4062	0.5590
20.77	0.4477	0.5830
21.60	0.5048	0.6170
22.47	0.5660	0.6494
23.56	0.6490	0.7020
24.48	0.7242	0.7331

Madani, Hakim - Valtz, Alain - Coquelet, Christophe, Isothermal vapor–liquid equilibrium data for the decafluorobutane (R3110)+1,1,1,3,3-pentafluorobutane (R365mfc) system at temperatures from 333K to 441K, Fluid Phase Equilibria. 354 (2013) 109-113. doi:10.1016/j.fluid.2013.06.031

T / K = 413.65

P / bar	x_1	y_1
15.56	0.0257	0.0761
16.41	0.0420	0.1170
17.32	0.0615	0.1520
18.36	0.0853	0.2030
19.23	0.1062	0.2350
20.49	0.1409	0.2860
21.71	0.1748	0.3236
23.02	0.2182	0.3660
23.56	0.2367	0.3756
24.72	0.2755	0.4060
25.46	0.3057	0.4260
26.94	0.3671	0.4538
27.78	0.4049	0.4350

Madani, Hakim - Valtz, Alain - Coquelet, Christophe, Isothermal vapor–liquid equilibrium data for the decafluorobutane (R3110)+1,1,1,3,3-pentafluorobutane (R365mfc) system at temperatures from 333K to 441K, Fluid Phase Equilibria. 354 (2013) 109-113. doi:10.1016/j.fluid.2013.06.031

T / K = 433.61

P / bar	x_1	y_1
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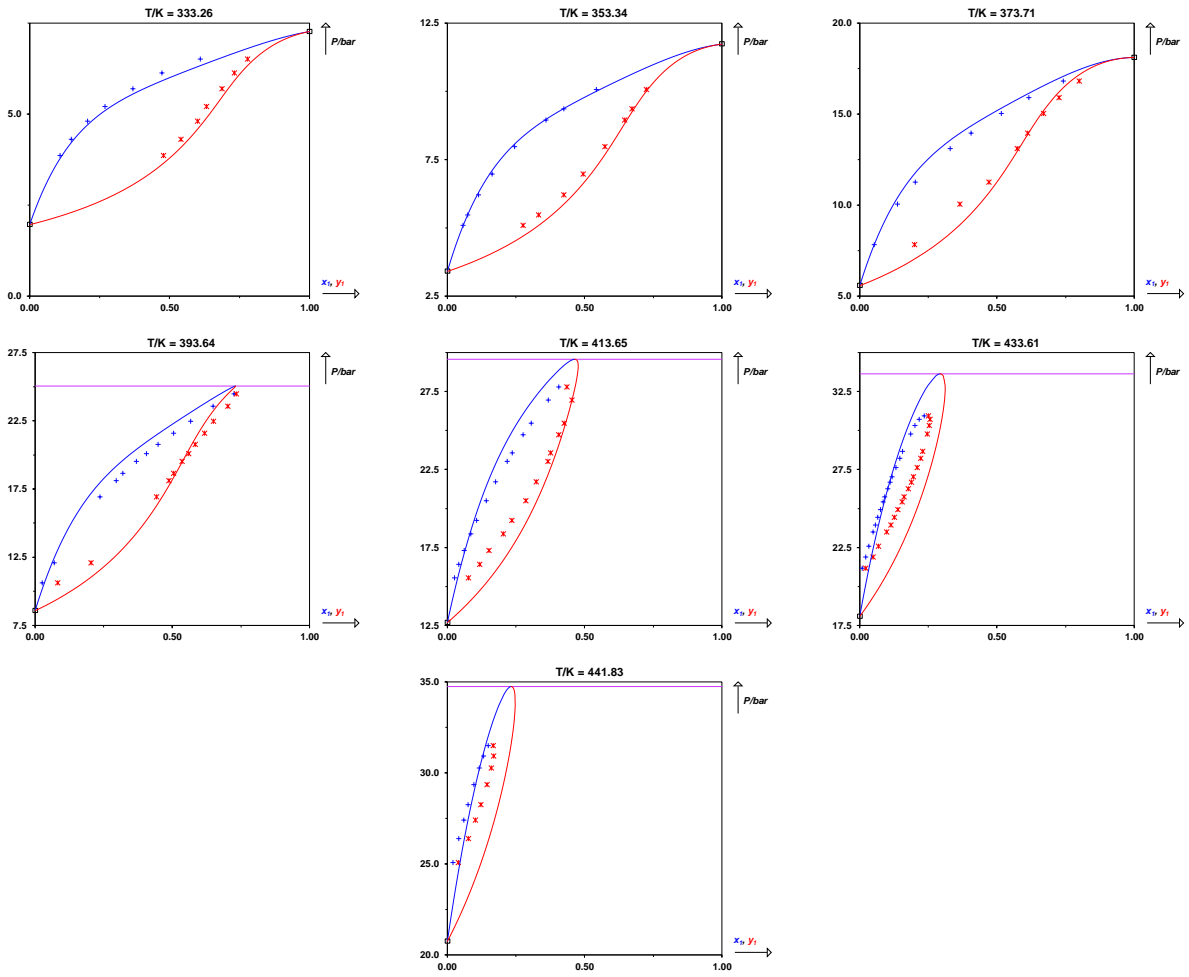
21.16	0.0089	0.0211
21.89	0.0216	0.0479
22.58	0.0326	0.0675
23.49	0.0483	0.0976
23.95	0.0566	0.1137
24.43	0.0654	0.1260
24.93	0.0749	0.1394
25.43	0.0847	0.1540
25.75	0.0913	0.1620
26.26	0.1017	0.1766
26.69	0.1109	0.1884
27.02	0.1181	0.1952
27.62	0.1317	0.2089
28.23	0.1461	0.2224
28.66	0.1559	0.2290
29.77	0.1852	0.2462
30.31	0.2012	0.2530
30.71	0.2162	0.2564
30.93	0.2352	0.2500

Madani, Hakim - Valtz, Alain - Coquelet, Christophe, Isothermal vapor–liquid equilibrium data for the decafluorobutane (R3110)+1,1,1,3,3-pentafluorobutane (R365mfc) system at temperatures from 333K to 441K, Fluid Phase Equilibria. 354 (2013) 109-113. doi:10.1016/j.fluid.2013.06.031

T / K = 441.83

P / bar	x_1	y_1
25.06	0.0203	0.0402
26.40	0.0419	0.0768
27.42	0.0595	0.1019
28.26	0.0748	0.1213
29.36	0.0962	0.1438
30.28	0.1157	0.1595
30.93	0.1313	0.1678
31.49	0.1484	0.1664

HD-NA systems (BAC = 3)



CARBON MONOXIDE (1) + CARBON DIOXIDE (2)

CAS	630-08-0	124-38-9
InChiKey	WSFSSNUMVMOOMR-UHFFFAOYSA-N	CURLTUGMZLYLDI-UHFFFAOYSA-N
T_c / K	132.92	304.21
P_c / bar	34.99	73.83
ω	0.048	0.224

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

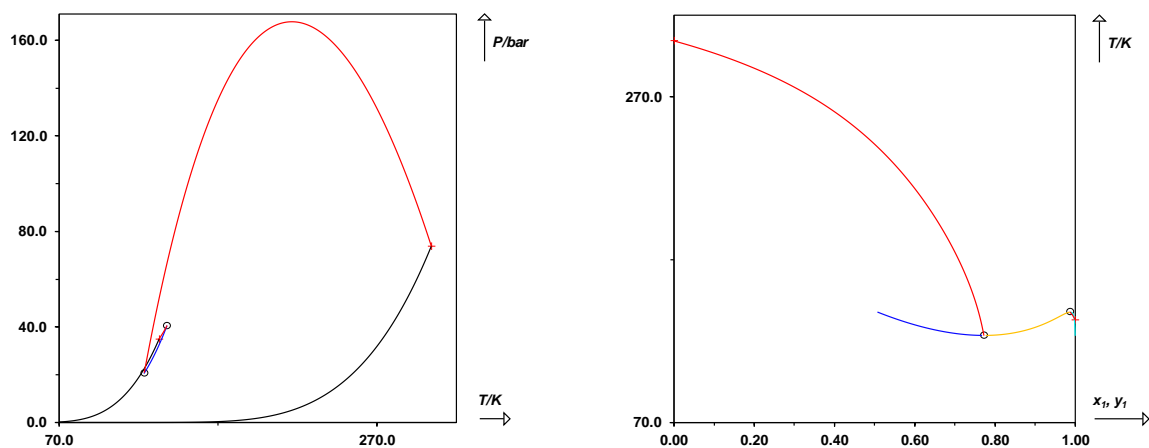
$A/\text{MPa} = 145.8$

$B/\text{MPa} = -20.27$

Deviations

MAPE on $x = 7.4\%$

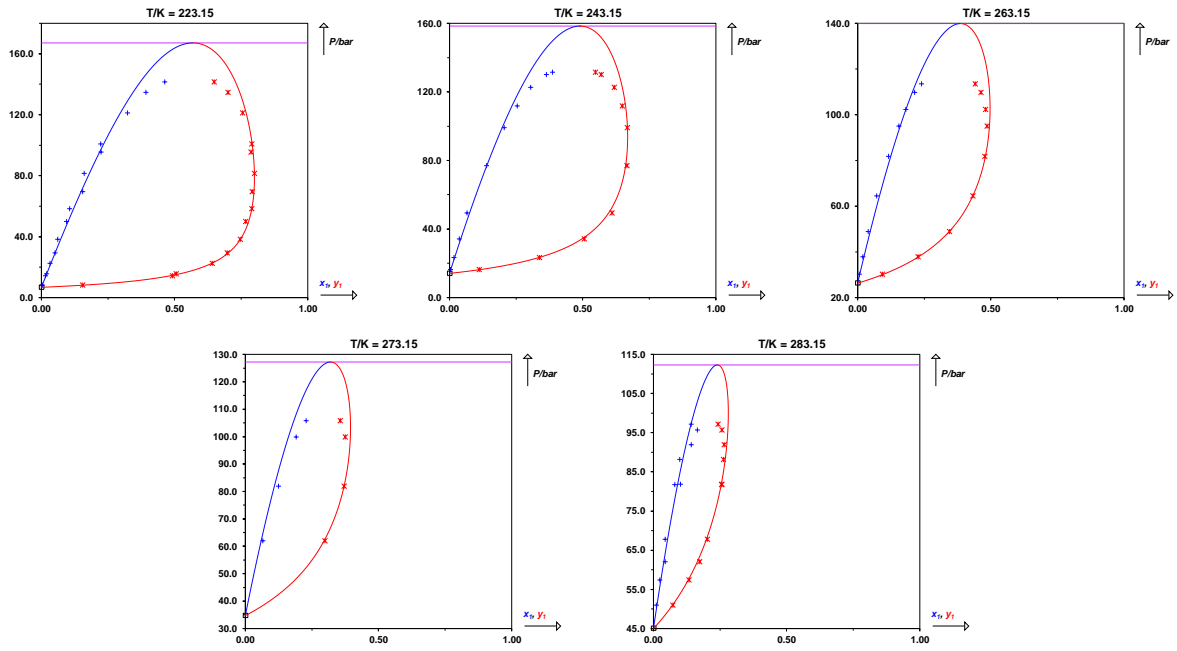
MAPE on $y = 3.5\%$



-----			131.42	0.3870	0.5480
Isothermal phase equilibrium data					

Huamin, S., Solubility Of Carbon Monoxide In Methanol And Carbon Dioxide Under High Pressure, Huaxue Gongcheng. 19 (1991) 61-69.			Christiansen, L. J. - Fredenslund, A. - Gardner, N., Gas-Liquid Equilibria of the CO ₂ -CO and CO ₂ -CH ₄ -CO Systems, Advances in Cryogenic Engineering. (1995) 309-319.		
T / K = 223.15			T / K = 263.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
15.72	0.0195	0.5059	30.26	0.0064	0.0930
29.45	0.0516	0.6968	37.84	0.0189	0.2260
50.05	0.0942	0.7662	48.87	0.0387	0.3440
69.60	0.1552	0.7908	64.44	0.0710	0.4320
Kaminishi, Gen-Ichi - Arai, Yasuhiko - Saito, Shozaburo - Maeda, Siro, Vapor-Liquid Equilibria For Binary And Ternary Systems Containing Carbon Dioxide, Journal of Chemical Engineering of Japan. 1 (1968) 109-116. doi:10.1252/jcej.1.109			81.74	0.1160	0.4770
T / K = 223.15			94.98	0.1550	0.4860
P / bar	x ₁	y ₁	102.25	0.1800	0.4800
95.45	0.2230	0.7870	109.84	0.2140	0.4630
121.29	0.3230	0.7550	113.55	0.2400	0.4410
Christiansen, L. J. - Fredenslund, A. - Gardner, N., Gas-Liquid Equilibria of the CO ₂ -CO and CO ₂ -CH ₄ -CO Systems, Advances in Cryogenic Engineering. (1995) 309-319.			Kaminishi, Gen-Ichi - Arai, Yasuhiko - Saito, Shozaburo - Maeda, Siro, Vapor-Liquid Equilibria For Binary And Ternary Systems Containing Carbon Dioxide, Journal of Chemical Engineering of Japan. 1 (1968) 109-116. doi:10.1252/jcej.1.109		
T / K = 223.15			T / K = 273.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
8.268	0.0028	0.1550	62.01	0.0660	0.2990
14.23	0.0148	0.4910	81.87	0.1240	0.3710
22.50	0.0318	0.6410	99.81	0.1910	0.3750
38.34	0.0610	0.7470	105.78	0.2280	0.3560
58.31	0.1060	0.7900	Kaminishi, Gen-Ichi - Arai, Yasuhiko - Saito, Shozaburo - Maeda, Siro, Vapor-Liquid Equilibria For Binary And Ternary Systems Containing Carbon Dioxide, Journal of Chemical Engineering of Japan. 1 (1968) 109-116. doi:10.1252/jcej.1.109		
81.44	0.1610	0.8000	T / K = 283.15		
100.72	0.2220	0.7890	P / bar	x ₁	y ₁
134.75	0.3920	0.7000	62.01	0.0430	0.1730
141.53	0.4630	0.6490	81.87	0.1020	0.2570
Christiansen, L. J. - Fredenslund, A. - Gardner, N., Gas-Liquid Equilibria of the CO ₂ -CO and CO ₂ -CH ₄ -CO Systems, Advances in Cryogenic Engineering. (1995) 309-319.			91.90	0.1420	0.2650
T / K = 243.15			95.65	0.1650	0.2570
P / bar	x ₁	y ₁	Christiansen, L. J. - Fredenslund, A. - Gardner, N., Gas-Liquid Equilibria of the CO ₂ -CO and CO ₂ -CH ₄ -CO Systems, Advances in Cryogenic Engineering. (1995) 309-319.		
16.46	0.0037	0.1120	T / K = 283.15		
23.37	0.0162	0.3380	P / bar	x ₁	y ₁
34.15	0.0360	0.5060	50.98	0.0106	0.0730
49.36	0.0660	0.6100	57.44	0.0230	0.1330
77.06	0.1390	0.6660	67.76	0.0436	0.2020
99.03	0.2050	0.6670	81.75	0.0800	0.2550
111.77	0.2540	0.6490	88.14	0.0990	0.2630
122.55	0.3040	0.6190	97.18	0.1410	0.2420
130.21	0.3640	0.5700			

HA-HA or HD-HD systems (BAC = 4)



OXYGEN (1) + CARBON DIOXIDE (2)

CAS	7782-44-7	124-38-9
InChiKey	XLYOFNOQVPJJNP-UHFFFAOYSA-N	CURLTUGMZLYLDI-UHFFFAOYSA-N
T_c / K	154.58	304.21
P_c / bar	50.43	73.83
ω	0.022	0.224

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 158.9$

$B/\text{MPa} = 159.2$

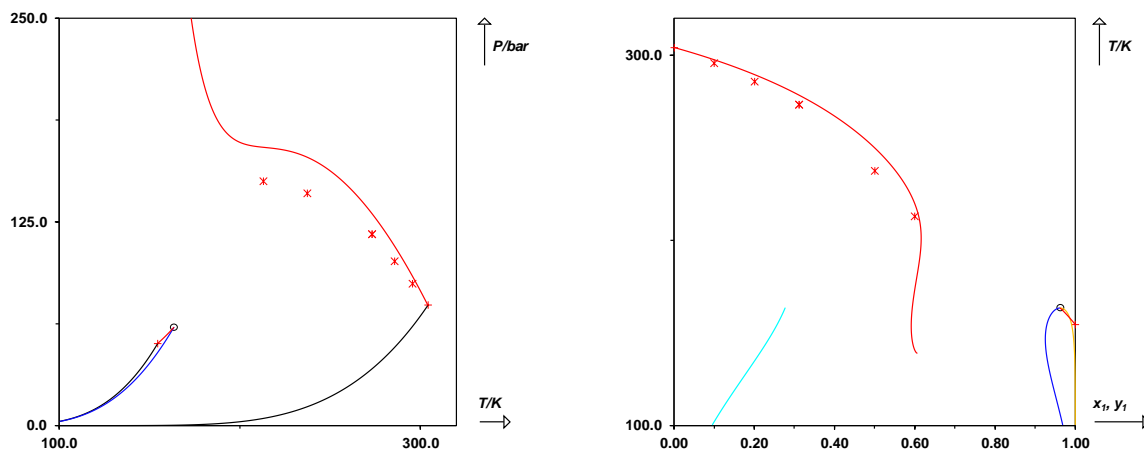
Deviations

MAPE on $x = 5.4\%$

MAPE on $y = 4.0\%$

MAPE on $x_c = 10\%$

MAPE on $P_c = 11\%$



Isothermal phase equilibrium data

Zenner, G.H. - Dana, L.I., Liquid-vapor equilibrium compositions of carbon dioxideoxygen-nitrogen mixtures, Chem. Eng. Progr. Symp. Ser. 59 (1963) 36-41.

T / K = 218.15

P / bar	x ₁	y ₁
21.89	0.0330	0.7040
39.42	0.0720	0.8120
59.07	0.1190	0.8470
78.83	0.1740	0.8530
97.17	0.2340	0.8510
118.25	0.3120	0.8220
130.10	0.3820	0.7890
140.23	0.4680	0.7360

Fredenslund, Aage - Sather, G. A., Gas-liquid equilibrium of the oxygen-carbon dioxide system, Journal of Chemical & Engineering Data. 15 (1970) 17-22. doi:10.1021/je60044a024

T / K = 223.15

P / bar	x ₁	y ₁
10.13	0.0080	0.3120
20.27	0.0250	0.6170
30.40	0.0490	0.7120
40.53	0.0710	0.7610
50.66	0.0960	0.7890
60.80	0.1170	0.8090
70.93	0.1500	0.8140
81.06	0.1890	0.8180
91.19	0.2200	0.8200
101.33	0.2670	0.8190
111.46	0.2930	0.7970
121.59	0.3340	0.7800
131.72	0.3930	0.7620

Zenner, G.H. - Dana, L.I., Liquid-vapor equilibrium compositions of carbon dioxideoxygen-nitrogen mixtures, Chem. Eng. Progr. Symp. Ser. 59 (1963) 36-41.

T / K = 232.85

P / bar	x ₁	y ₁
142.97	0.4970	0.6170
134.86	0.4030	0.7070
125.34	0.3400	0.7200
111.46	0.2760	0.7530
94.64	0.2170	0.7680
77.72	0.1645	0.7700
59.17	0.1130	0.7740

Fredenslund, Aage - Sather, G. A., Gas-liquid equilibrium of the oxygen-carbon dioxide system, Journal of Chemical & Engineering Data. 15 (1970) 17-22. doi:10.1021/je60044a024

T / K = 233.15

P / bar	x ₁	y ₁
20.27	0.0210	0.4190
30.40	0.0410	0.5890
40.53	0.0640	0.6510
50.66	0.0870	0.6950
60.80	0.1200	0.7230
70.93	0.1410	0.7410
81.06	0.1670	0.7570
91.19	0.2050	0.7660
101.33	0.2480	0.7670
111.46	0.2740	0.7600
121.59	0.3280	0.7300
131.72	0.3800	0.7020

Fredenslund, Aage - Sather, G. A., Gas-liquid equilibrium of the oxygen-carbon dioxide system, Journal of Chemical & Engineering Data. 15 (1970) 17-22. doi:10.1021/je60044a024

T / K = 243.15

P / bar	x ₁	y ₁
20.27	0.0100	0.2750
30.40	0.0310	0.4630
40.53	0.0520	0.5510
50.66	0.0800	0.6090
60.80	0.1040	0.6440
70.93	0.1400	0.6710
81.06	0.1620	0.6930
91.19	0.1910	0.6890
101.33	0.2360	0.6940
111.46	0.2660	0.6820
121.59	0.3060	0.6710

Kaminishi, G.I. - Toriumi, T., Gas-liquid equilibrium under high pressures. VI. Vapor-liquid phase equilibrium in the CO₂-H₂, CO₂-N₂, and CO₂-O₂ systems, Kogyo Kagaku Zasshi. 69 (1966) 175-178.

T / K = 253.15

P / bar	x ₁	y ₁
36.98	0.0360	0.3830
52.69	0.0720	0.5160
101.83	0.2180	0.6120
127.37	0.3710	0.5640

Fredenslund, Aage - Sather, G. A., Gas-liquid equilibrium of the oxygen-carbon dioxide system, Journal of Chemical & Engineering Data. 15 (1970) 17-22. doi:10.1021/je60044a024

T / K = 253.15

P / bar	x_1	y_1
20.27	0.0060	0.0610
30.40	0.0300	0.3020
40.53	0.0420	0.4000
50.66	0.0620	0.5000
60.80	0.0920	0.5400
70.93	0.1250	0.5600
81.06	0.1410	0.5740
91.19	0.1700	0.6010
101.33	0.2200	0.5990
111.46	0.2550	0.6010
121.59	0.3000	0.5700

Fredenslund, Aage - Sather, G. A., Gas-liquid equilibrium of the oxygen-carbon dioxide system, Journal of Chemical & Engineering Data. 15 (1970) 17-22. doi:10.1021/je60044a024

T / K = 263.15

P / bar	x_1	y_1
30.40	0.0090	0.0960
40.53	0.0350	0.2630
50.66	0.0560	0.3460
60.80	0.0790	0.4170
70.93	0.1100	0.4630
81.06	0.1340	0.4930
91.19	0.1620	0.4950
101.33	0.1950	0.5000
111.46	0.2430	0.4980
121.59	0.2990	0.4460

Kaminishi, G.I. - Toriumi, T., Gas-liquid equilibrium under high pressures. VI. Vapor-liquid phase equilibrium in the CO₂-H₂, CO₂-N₂, and CO₂-O₂ systems, Kogyo Kagaku Zasshi. 69 (1966) 175-178.

T / K = 273.15

P / bar	x_1	y_1
50.66	0.0360	0.2200
74.17	0.0960	0.3710
96.26	0.1660	0.4110
105.68	0.2060	0.4080

Chueh, P. L. - Muirbrook, N. K. - Prausnitz, J. M., Multicomponent vapor-liquid equilibria at high pressures: Part II. Thermodynamic analysis, AIChE Journal. 11 (1965) 1097-1102. doi:10.1002/aic.690110625

T / K = 273.15

P / bar	x_1	y_1
55.16	0.0455	0.2520
82.74	0.1205	0.3838
103.42	0.1980	0.4065

Zenner, G.H. - Dana, L.I., Liquid-vapor equilibrium compositions of carbon dioxide-oxygen-nitrogen mixtures, Chem. Eng. Progr. Symp. Ser. 59 (1963) 36-41.

T / K = 273.15

P / bar	x_1	y_1
60.19	0.0603	0.2980
53.20	0.0432	0.2540
69.71	0.0843	0.3530
84.91	0.1293	0.4070
94.23	0.1600	0.4205
104.06	0.1985	0.4220
111.05	0.2370	0.3990

Fredenslund, Aage - Sather, G. A., Gas-liquid equilibrium of the oxygen-carbon dioxide system, Journal of Chemical & Engineering Data. 15 (1970) 17-22. doi:10.1021/je60044a024

T / K = 273.15

P / bar	x_1	y_1
40.53	0.0100	0.0990
50.66	0.0420	0.2140
60.80	0.0620	0.2980
70.93	0.0900	0.3360
81.06	0.1260	0.3720
91.19	0.1470	0.3980
101.33	0.1850	0.4010
111.46	0.2470	0.3620

Fredenslund, Aage - Sather, G. A., Gas-liquid equilibrium of the oxygen-carbon dioxide system, Journal of Chemical & Engineering Data. 15 (1970) 17-22. doi:10.1021/je60044a024

T / K = 283.15

P / bar	x_1	y_1
50.66	0.0280	0.1150
60.80	0.0400	0.1610
70.93	0.0710	0.2180
81.06	0.0870	0.2630
91.19	0.1150	0.2940
101.33	0.1870	0.2630

Critical point

Booth, H. S. - Carter, J. M., The Critical Constants of Carbon Dioxide-Oxygen Mixtures, The Journal of Physical Chemistry. 34 (1930) 2801-2825. doi:10.1021/j150318a013

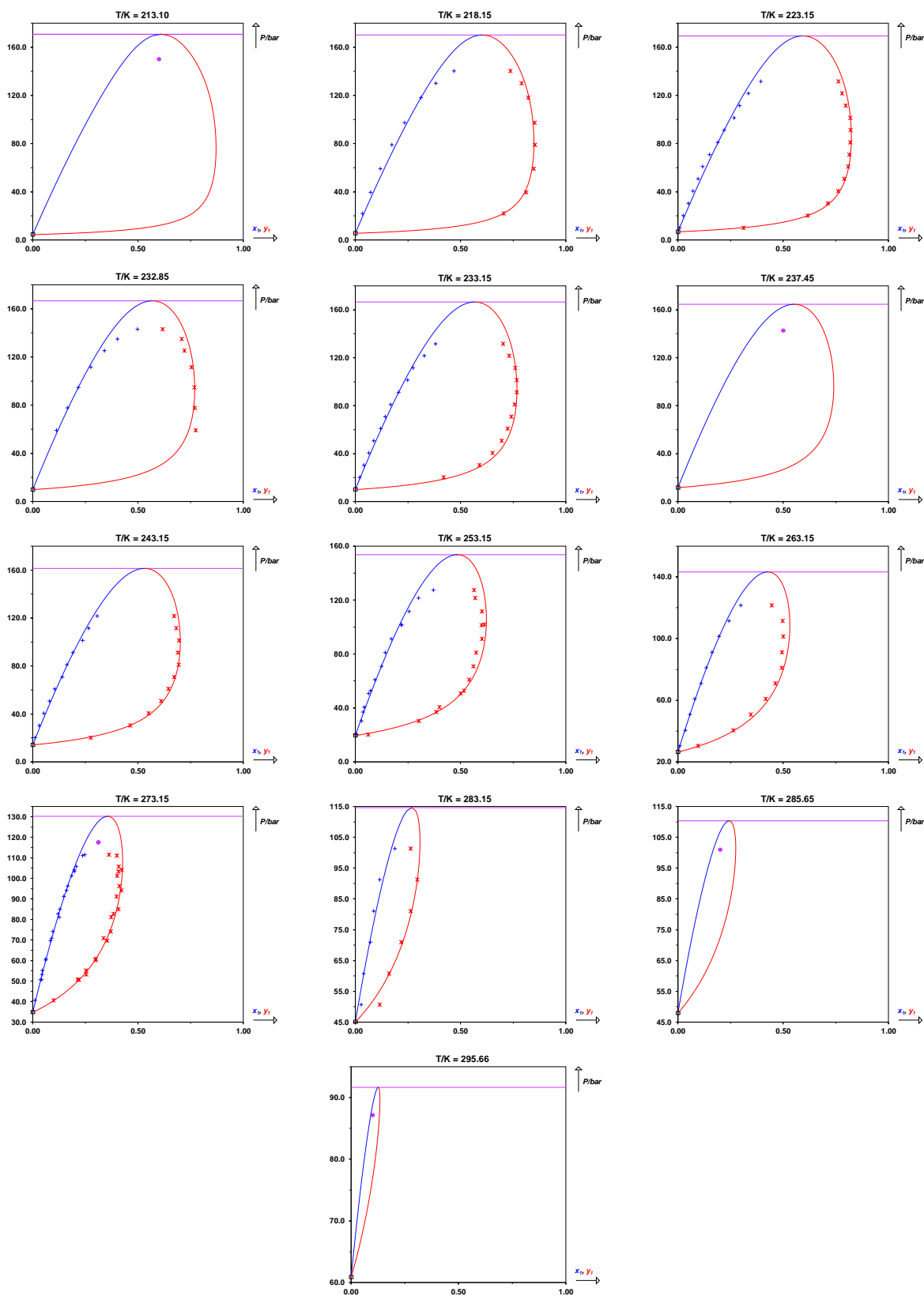
T / K	P / bar	x_1
213.10	149.96	0.6000
237.45	142.56	0.5000

285.65	100.92	0.2000
295.66	87.14	0.1000

Muirbrook, N. K. - Prausnitz, J. M., Multicomponent vapor-liquid equilibria at high pressures: Part I. Experimental study of the nitrogen—oxygen—carbon dioxide system at 0°C, AIChE Journal. 11 (1965) 1092-1096. doi:10.1002/aic.690110624

T / K	P / bar	x_1
273.15	117.42	0.3120

HA-HA or HD-HD systems (BAC = 4)



CARBON DIOXIDE (1) + HYDROGEN SULFIDE (2)

CAS	124-38-9	7783-06-4
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	RWSOTUBLDIXVET-UHFFFAOYSA-N
T_c / K	304.21	373.53
P_c / bar	73.83	89.63
ω	0.224	0.094

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 140.0$

$B/\text{MPa} = 206.1$

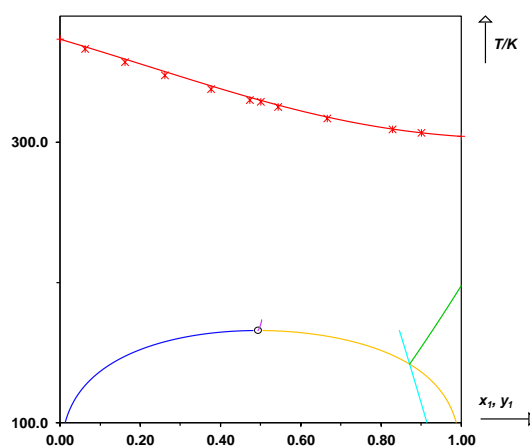
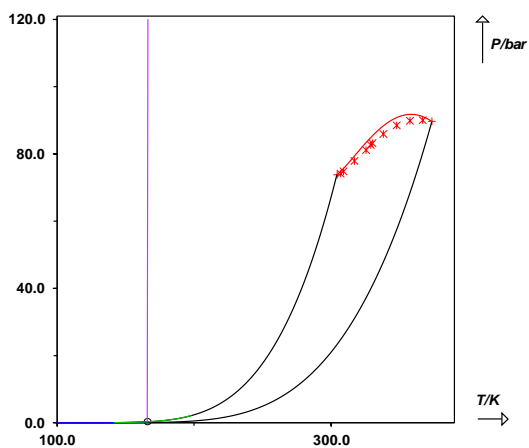
Deviations

MAPE on $x = 5.2\%$

MAPE on $y = 2.9\%$

MAPE on $x_c = 5.6\%$

MAPE on $P_c = 2.0\%$



-----			224.82	0.7180	0.8980
Isothermal phase equilibrium data			227.59	0.4990	0.7960
-----			233.15	0.2860	0.6710
Chapoy, Antonin - Coquelet, Christophe - Liu, Haifan - Valtz, Alain - Tohidi, Bahman, Vapour-liquid equilibrium data for the hydrogen sulphide (H ₂ S)+carbon dioxide (CO ₂) system at temperatures from 258 to 313K, Fluid Phase Equilibria. 356 (2013) 223-228. doi:10.1016/j.fluid.2013.07.050			238.71	0.1500	0.5500
T / K = 273.15			244.26	0.0850	0.4280
P / bar	x ₁	y ₁	249.82	0.0440	0.3000
13.75	0.0541	0.2346	255.37	0.0160	0.1600
17.22	0.1260	0.4006	Sobocinski, D. P. - Kurata, Fred, Heterogeneous phase equilibria of the hydrogen sulfide-carbon dioxide system, AIChE Journal. 5 (1959) 545-551. doi:10.1002/aic.690050425		
22.46	0.2920	0.5878	P / bar = 13.79		
24.84	0.3959	0.6506	T / K	x ₁	y ₁
28.99	0.5897	0.7522	243.15	0.8590	0.9250
Ferrell, J.K. - Rousseau, R.W. - Bass, D.G., The solubility of acid gases in methanol (1979) 1-40.			244.26	0.7650	0.8800
T / K = 293.00			249.82	0.4530	0.7410
P / bar	x ₁	y ₁	255.37	0.2800	0.6310
20.27	0.0200	0.1310	260.93	0.1780	0.5250
25.33	0.0900	0.3150	266.48	0.1130	0.4100
30.40	0.1790	0.4500	272.04	0.0690	0.2770
35.46	0.2850	0.5430	277.59	0.0330	0.1450
40.53	0.4200	0.6300	280.37	0.0170	0.0780
45.60	0.5630	0.7100	Sobocinski, D. P. - Kurata, Fred, Heterogeneous phase equilibria of the hydrogen sulfide-carbon dioxide system, AIChE Journal. 5 (1959) 545-551. doi:10.1002/aic.690050425		
50.66	0.7390	0.8110	P / bar = 20.68		
52.69	0.8200	0.8700	T / K	x ₁	y ₁
Chapoy, Antonin - Coquelet, Christophe - Liu, Haifan - Valtz, Alain - Tohidi, Bahman, Vapour-liquid equilibrium data for the hydrogen sulphide (H ₂ S)+carbon dioxide (CO ₂) system at temperatures from 258 to 313K, Fluid Phase Equilibria. 356 (2013) 223-228. doi:10.1016/j.fluid.2013.07.050			294.26	0.0220	0.1060
T / K = 313.02			288.71	0.0520	0.2300
P / bar	x ₁	y ₁	283.15	0.0930	0.3490
34.34	0.0489	0.1482	277.59	0.1500	0.4600
39.14	0.0983	0.2483	272.04	0.2480	0.5640
44.72	0.1655	0.3560	266.48	0.3700	0.6600
54.75	0.3028	0.5008	260.93	0.5510	0.7590
-----			258.15	0.6990	0.8250
Isobaric phase equilibrium data			256.48	0.8050	0.8810
-----			Bierlein, James A. - Kay, Webster B., Phase-Equilibrium Properties of System Carbon Dioxide-Hydrogen Sulfide, Industrial & Engineering Chemistry. 45 (1953) 618-624. doi:10.1021/ie50519a043		
Sobocinski, D. P. - Kurata, Fred, Heterogeneous phase equilibria of the hydrogen sulfide-carbon dioxide system, AIChE Journal. 5 (1959) 545-551. doi:10.1002/aic.690050425			P / bar = 40.53		
P / bar = 6.895			T / K	x ₁	y ₁
T / K	x ₁	y ₁	323.15	0.0350	0.1240
303.15	0.2320	0.4670	318.15	0.0740	0.2160
-----			313.15	0.1170	0.3000
			308.15	0.1680	0.3820
			303.15	0.2320	0.4670

HA-HA or HD-HD systems (BAC = 4)

298.15	0.3130	0.5460
293.15	0.4200	0.6300
288.15	0.5630	0.7200
283.15	0.7560	0.8350
282.15	0.7970	0.8620
281.15	0.8520	0.8990
280.15	0.9160	0.9420

Bierlein, James A. - Kay, Webster B., Phase-Equilibrium Properties of System Carbon Dioxide-Hydrogen Sulfide, Industrial & Engineering Chemistry. 45 (1953) 618-624. doi:10.1021/ie50519a043

P / bar = 50.66

T / K	x ₁	y ₁
338.15	0.0100	0.0450
333.15	0.0480	0.1320
328.15	0.0890	0.2160
323.15	0.1350	0.2950
318.15	0.1900	0.3740
313.15	0.2550	0.4550
308.15	0.3360	0.5340
303.15	0.4380	0.6140
298.15	0.5720	0.7010
293.15	0.7390	0.8110
290.15	0.8740	0.9080
289.15	0.9320	0.9500

Bierlein, James A. - Kay, Webster B., Phase-Equilibrium Properties of System Carbon Dioxide-Hydrogen Sulfide, Industrial & Engineering Chemistry. 45 (1953) 618-624. doi:10.1021/ie50519a043

P / bar = 60.80

T / K	x ₁	y ₁
348.15	0.0090	0.0350
343.15	0.0500	0.1220
338.15	0.0920	0.1940
333.15	0.1370	0.2710
328.15	0.1900	0.3450
323.15	0.2560	0.4230
318.15	0.3300	0.4960
313.15	0.4250	0.5830
308.15	0.5400	0.6620
303.15	0.6870	0.7590
298.15	0.8730	0.9010
297.15	0.9220	0.9380

Bierlein, James A. - Kay, Webster B., Phase-Equilibrium Properties of System Carbon Dioxide-Hydrogen Sulfide, Industrial & Engineering Chemistry. 45 (1953) 618-624. doi:10.1021/ie50519a043

P / bar = 81.06

T / K	x ₁	y ₁	
363.15	0.0250	0.0500	
358.15	0.0700	0.1270	
353.15	0.1160	0.1760	
348.15	0.1670	0.2400	
343.15	0.2250	0.3080	
338.15	0.2920	0.3730	
333.15	0.3660	0.4380	
328.15	0.4560	0.5080	
325.23	0.5440	0.5440	CRIT

Sobocinski, D. P. - Kurata, Fred, Heterogeneous phase equilibria of the hydrogen sulfide-carbon dioxide system, AIChE Journal. 5 (1959) 545-551. doi:10.1002/aic.690050425

P / bar = 82.74

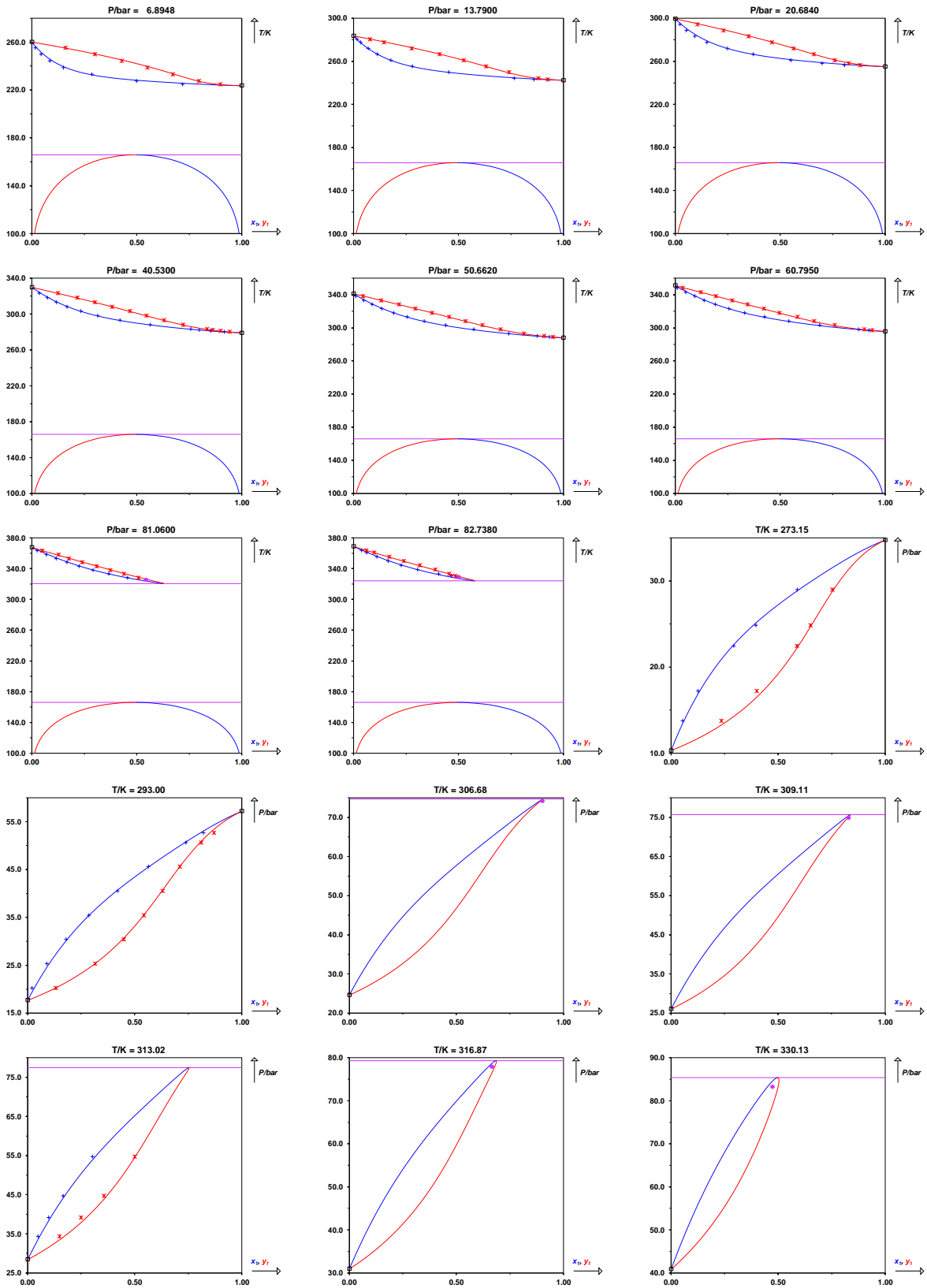
T / K	x ₁	y ₁	
363.71	0.0380	0.0610	
360.93	0.0620	0.0990	
355.37	0.1120	0.1700	
349.82	0.1650	0.2400	
344.26	0.2260	0.3160	
338.71	0.3040	0.3900	
333.15	0.4050	0.4550	
330.37	0.4650	0.4850	
328.82	0.5000	0.5000	CRIT

Critical point

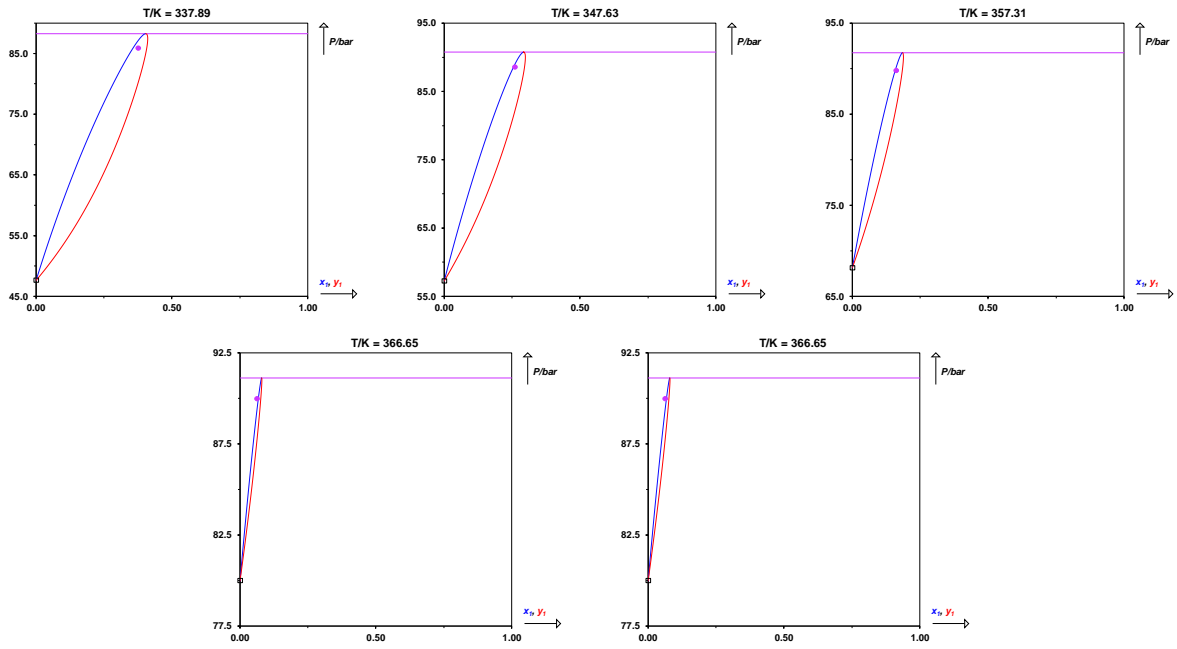
Bierlein, James A. - Kay, Webster B., Phase-Equilibrium Properties of System Carbon Dioxide-Hydrogen Sulfide, Industrial & Engineering Chemistry. 45 (1953) 618-624. doi:10.1021/ie50519a043

T / K	P / bar	x ₁
306.68	74.16	0.9009
309.11	74.83	0.8292
316.87	77.85	0.6659
330.13	83.21	0.4728
337.89	85.86	0.3759
347.63	88.52	0.2608
357.31	89.77	0.1614
366.65	89.97	0.0630

HA-HA or HD-HD systems (BAC = 4)



HA-HA or HD-HD systems (BAC = 4)



CARBON DIOXIDE (1) + DIMETHYL ETHER (2)

CAS	124-38-9	115-10-6
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	LCGLNKUTAGEVQW-UHFFFAOYSA-N
T_c / K	304.21	400.10
P_c / bar	73.83	53.70
ω	0.224	0.200

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -14.32$

$B/\text{MPa} = -19.10$

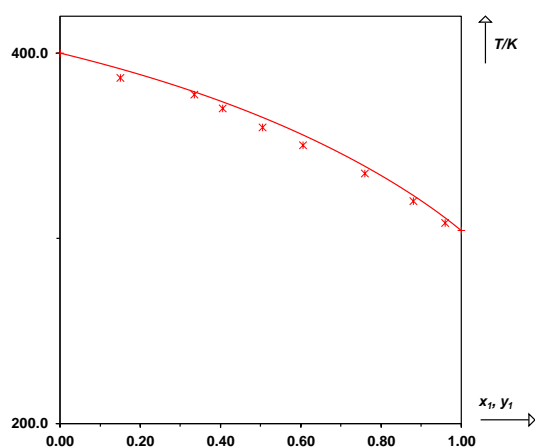
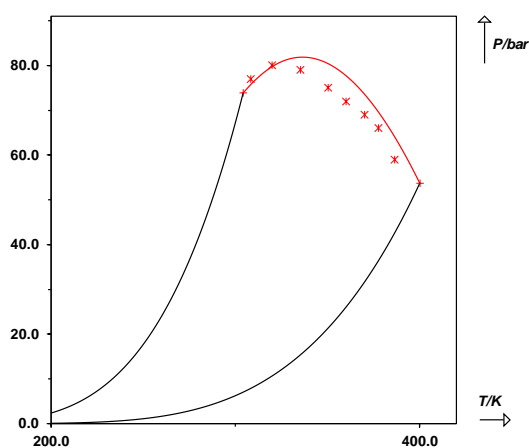
Deviations

MAPE on $x = 4.0\%$

MAPE on $y = 4.8\%$

MAPE on $x_c = 13\%$

MAPE on $P_c = 5.2\%$



-----			28.40	0.6284	0.8937
Isothermal phase equilibrium data			32.70	0.7079	0.9161
-----			37.30	0.7822	0.9391
Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018			41.20	0.8501	0.9580
T / K = 273.15			Laursen, T. - Rasmussen, P. - Andersen, S.I., VLE and VLE Measurements of Dimethyl Ether Containing Systems, J. Chem. Eng. Data. 47 (2002) 198-202. doi:10.1021/je010154+		
P / bar	x ₁	y ₁	T / K = 298.15		
4.100	0.0763	0.3613	P / bar	x ₁	y ₁
5.200	0.1270	0.5024	16.60	0.2597	0.6857
10.90	0.3658	0.7959	25.60	0.4546	0.8179
12.40	0.4286	0.8346	34.60	0.6164	0.8875
14.50	0.4877	0.8699	41.20	0.7261	0.9190
17.30	0.5722	0.9004	49.80	0.8478	0.9542
20.70	0.6631	0.9300	Laursen, T. - Rasmussen, P. - Andersen, S.I., VLE and VLE Measurements of Dimethyl Ether Containing Systems, J. Chem. Eng. Data. 47 (2002) 198-202. doi:10.1021/je010154+		
24.10	0.7445	0.9527	T / K = 308.65		
27.60	0.8325	0.9694	P / bar	x ₁	y ₁
31.00	0.9149	0.9833	13.00	0.1023	0.4052
Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018			17.70	0.1954	0.5821
T / K = 288.20			19.30	0.2272	0.5908
P / bar	x ₁	y ₁	25.70	0.3443	0.7292
13.80	0.3016	0.6943	31.10	0.4289	0.7874
17.40	0.3955	0.7793	38.80	0.5491	0.8476
20.70	0.4708	0.8277	45.80	0.6515	0.8791
25.50	0.5729	0.8733	50.80	0.7154	0.8986
31.00	0.6788	0.9097	57.30	0.7939	0.9221
35.90	0.7572	0.9345	Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018		
39.30	0.8140	0.9490	T / K = 308.65		
Jonasson, Ari - Persson, Ole - Fredenslund, Aage, High Pressure Solubility of Carbon Dioxide and Carbon Monoxide in Dimethyl Ether, Journal of Chemical & Engineering Data. 40 (1995) 296-300. doi:10.1021/je00017a066			P / bar	x ₁	y ₁
T / K = 288.20			9.000	0.0291	0.1354
P / bar	x ₁	y ₁	11.70	0.0891	0.3421
5.000	0.0149	0.1733	15.90	0.1840	0.4987
6.000	0.0541	0.3061	18.60	0.2433	0.5743
7.200	0.1019	0.4312	22.10	0.3102	0.6528
8.600	0.1518	0.5242	24.50	0.3535	0.6856
10.20	0.2022	0.6047	27.60	0.4055	0.7320
12.40	0.2663	0.6794	30.70	0.4568	0.7702
14.80	0.3240	0.7365	37.90	0.5695	0.8241
17.70	0.4030	0.7888	41.40	0.6141	0.8488
21.00	0.4782	0.8322	44.80	0.6597	0.8670
24.60	0.5526	0.8639	48.30	0.7006	0.8857

HA-HA or HD-HD systems (BAC = 4)

51.70 0.7427 0.8962
60.00 0.8375 0.9257
62.60 0.8611 0.9329

Jonasson, Ari - Persson, Ole - Fredenslund, Aage, High Pressure Solubility of Carbon Dioxide and Carbon Monoxide in Dimethyl Ether, Journal of Chemical & Engineering Data. 40 (1995) 296-300. doi:10.1021/je00017a066

T / K = 308.65

P / bar	x ₁	y ₁
8.700	0.0212	0.1230
10.60	0.0689	0.2783
12.40	0.1094	0.3828
14.60	0.1569	0.4773
17.00	0.2067	0.5468
19.60	0.2583	0.6103
22.30	0.3061	0.6633
25.00	0.3575	0.7035
28.00	0.4050	0.7465
34.30	0.5055	0.8171
37.60	0.5602	0.8417
42.80	0.6266	0.8710
45.20	0.6582	0.8808
48.00	0.6934	0.8839
51.10	0.7291	0.8922
53.90	0.7596	0.9149
56.60	0.7917	0.9186
61.20	0.8395	0.9271
62.50	0.8516	0.9294
63.30	0.8577	0.9335

Laursen, T. - Rasmussen, P. - Andersen, S.I., VLE and VLLE Measurements of Dimethyl Ether Containing Systems, J. Chem. Eng. Data. 47 (2002) 198-202. doi:10.1021/je010154+

T / K = 320.15

P / bar	x ₁	y ₁
14.50	0.0708	0.2862
18.70	0.1412	0.4432
25.60	0.2590	0.5992
34.30	0.3880	0.7106
40.40	0.4768	0.7651
50.30	0.5932	0.8218
55.90	0.6536	0.8476
64.10	0.7414	0.8684
69.70	0.7869	0.8769
73.20	0.8140	0.8886

Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether,

Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018

T / K = 335.17

P / bar	x ₁	y ₁	
17.90	0.0448	0.1563	
20.00	0.0756	0.2404	
23.60	0.1254	0.3588	
28.30	0.1930	0.4663	
32.50	0.2499	0.5298	
38.60	0.3286	0.6033	
48.30	0.4361	0.6780	
55.90	0.5216	0.7126	
65.40	0.6130	0.7525	
72.40	0.6845	0.7710	
75.80	0.7126	0.7720	
79.30	0.7364	0.7701	
79.00	0.7600	0.7600	CRIT

Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018

T / K = 350.20

P / bar	x ₁	y ₁	
21.70	0.0112	0.0340	
23.40	0.0312	0.0895	
25.50	0.0553	0.1611	
27.60	0.0797	0.2143	
31.40	0.1231	0.3074	
35.70	0.1722	0.3879	
41.50	0.2410	0.4652	
46.50	0.2955	0.5065	
57.90	0.4137	0.5916	
62.40	0.4508	0.6110	
66.90	0.4900	0.6272	
69.10	0.5168	0.6342	
75.00	0.6050	0.6050	CRIT

Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018

T / K = 360.07

P / bar	x ₁	y ₁
26.10	0.0104	0.0313
27.90	0.0296	0.0809
29.90	0.0502	0.1336
32.50	0.0787	0.1952
35.30	0.1082	0.2528
45.20	0.2135	0.3942
49.30	0.2531	0.4320

HA-HA or HD-HD systems (BAC = 4)

52.50	0.2850	0.4570		44.10	0.0251	0.0457	
56.90	0.3269	0.4878		47.30	0.0508	0.0832	
60.90	0.3652	0.5040		49.30	0.0684	0.1122	
65.50	0.4093	0.5273		51.70	0.0888	0.1388	
69.00	0.4434	0.5351		53.80	0.1064	0.1589	
71.10	0.4734	0.5283		55.90	0.1243	0.1744	
72.00	0.5050	0.5050	CRIT	59.00	0.1500	0.1500	CRIT

Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018

T / K = 370.13

P / bar	x ₁	y ₁	
31.90	0.0134	0.0317	
33.80	0.0317	0.0774	
36.40	0.0564	0.1304	
40.30	0.0923	0.1975	
43.40	0.1226	0.2462	
53.70	0.2268	0.3611	
55.20	0.2376	0.3724	
56.80	0.2546	0.3835	
66.10	0.3460	0.4276	
69.00	0.4050	0.4050	CRIT

Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018

T / K = 377.57

P / bar	x ₁	y ₁	
35.90	0.0101	0.0187	
41.00	0.0523	0.1109	
42.70	0.0679	0.1358	
45.50	0.0932	0.1798	
48.30	0.1177	0.2127	
51.00	0.1436	0.2429	
53.80	0.1692	0.2729	
56.90	0.1996	0.2972	
60.00	0.2311	0.3164	
63.70	0.2765	0.3288	
66.00	0.3350	0.3350	CRIT

Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018

T / K = 386.56

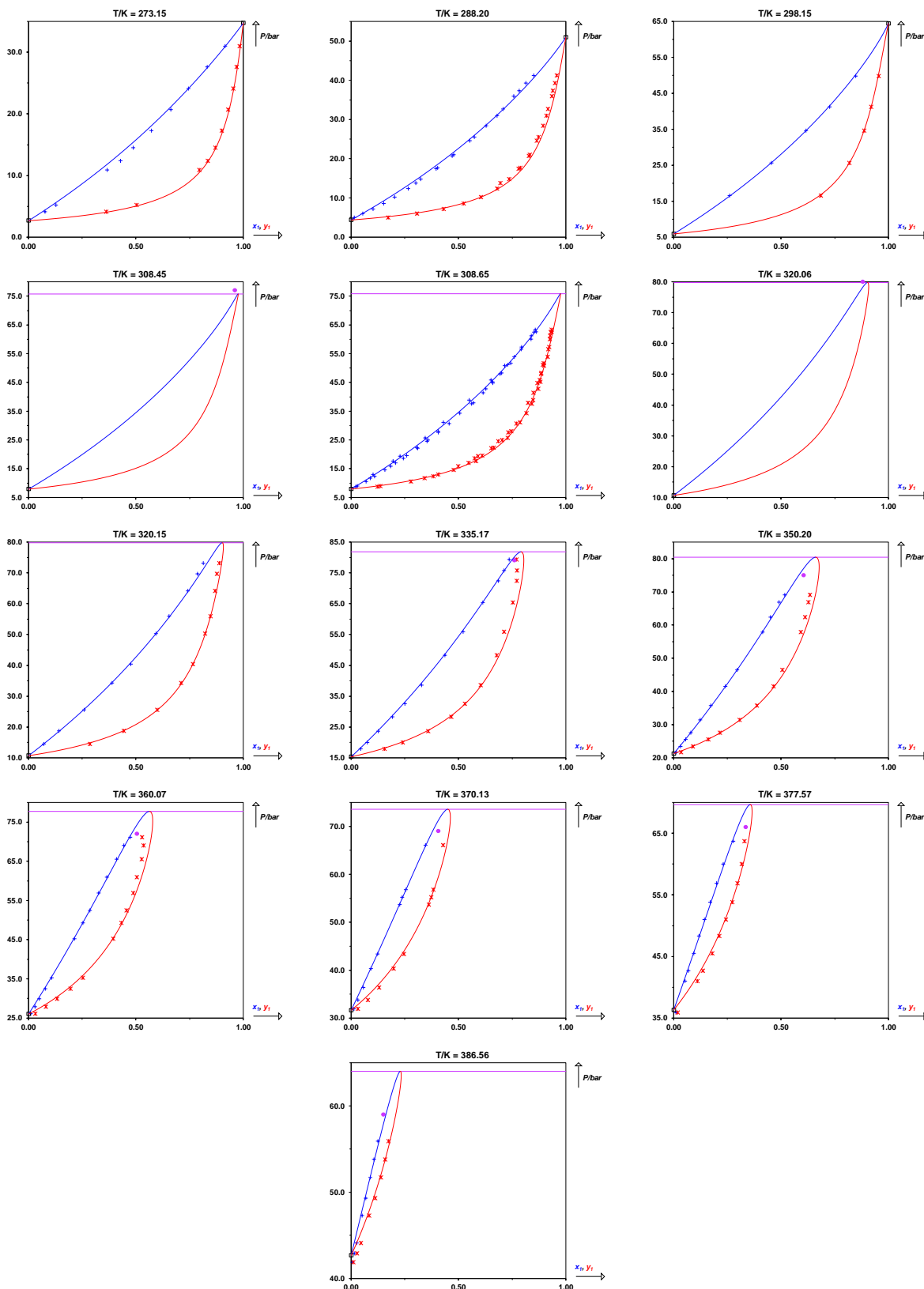
P / bar	x ₁	y ₁
41.90	0.0060	0.0102
42.90	0.0146	0.0273

Critical point

Tsang, Charles Y. - Streett, William B., Vapor-liquid equilibrium in the system carbon dioxide/dimethyl ether, Journal of Chemical & Engineering Data. 26 (1981) 155-159. doi:10.1021/je00024a018

T / K	P / bar	x ₁
308.45	77.00	0.9600
320.06	80.00	0.8800

HA-HA or HD-HD systems (BAC = 4)



CARBON DIOXIDE (1) + CARBON DISULFIDE (2)

CAS	124-38-9	75-15-0
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	QGJOPFRUJISHPQ-UHFFFAOYSA-N
T_c / K	304.21	552.00
P_c / bar	73.83	79.00
ω	0.224	0.111

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 206.6

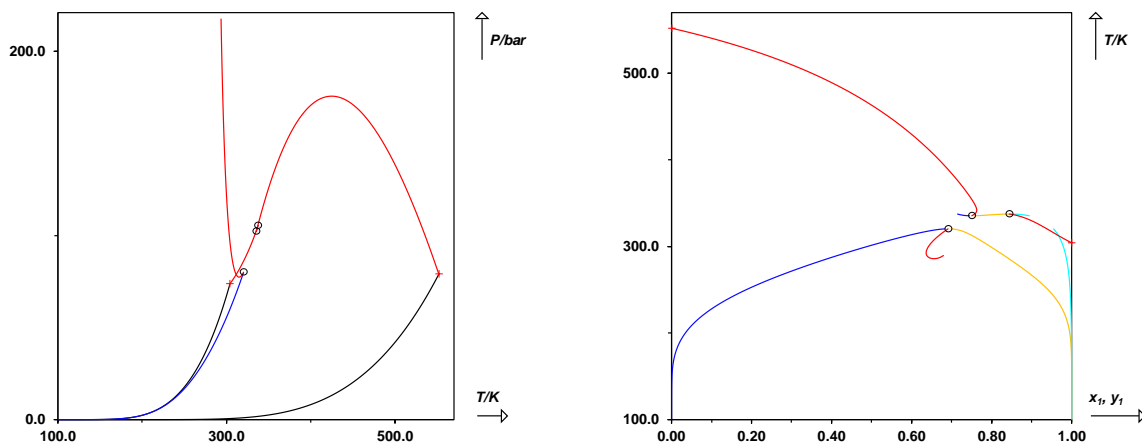
B/MPa = 497.4

Deviations

MAPE on x = 14 %

MAPE on y = 6.7 %

MAPE on h^M = 18 %



-----			42.43	0.9055	0.9875
Isothermal phase equilibrium data					

Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3			Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3		
T / K = 273.15			T / K = 290.00		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
4.740	0.0260	0.9593	5.120	0.0200	0.9258
10.32	0.0518	0.9797	15.02	0.0632	0.9701
20.14	0.1182	0.9862	25.21	0.1181	0.9785
25.71	0.1761	0.9878	34.68	0.1918	0.9813
28.07	0.2100	0.9861	38.23	0.2351	0.9814
30.08	0.2630	0.9883	41.33	0.2921	0.9816
31.22	0.8711	0.9892	44.08	0.4454	0.9824
31.68	0.8967	0.9910	45.98	0.8613	0.9839
32.22	0.9237	0.9919	46.90	0.8891	0.9850
			48.24	0.9244	0.9869
Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3			Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3		
T / K = 280.00			T / K = 299.88		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
5.740	0.0301	0.9557	5.300	0.0165	0.8945
11.78	0.0604	0.9723	10.00	0.0350	0.9400
20.11	0.1135	0.9806	15.04	0.0530	0.9567
27.07	0.1683	0.9830	20.20	0.0750	0.9646
31.08	0.2189	0.9845	30.00	0.1249	0.9720
33.14	0.2523	0.9850	40.05	0.1907	0.9753
34.65	0.3042	0.9853	45.78	0.2524	0.9740
35.90	0.3674	0.9859	52.86	0.4699	0.9747
37.02	0.8846	0.9889	53.39	0.5565	0.9754
37.61	0.9123	0.9899	54.28	0.7397	0.9753
38.45	0.9367	0.9920	56.21	0.8458	0.9769
			58.34	0.8986	0.9789
Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3			Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3		
T / K = 285.00			T / K = 310.00		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
5.040	0.0240	0.9366	5.180	0.0148	0.8465
10.18	0.0476	0.9642	10.31	0.0321	0.9183
19.98	0.0950	0.9782	20.20	0.0695	0.9489
38.73	0.3130	0.9834	30.05	0.1123	0.9611
39.79	0.3804	0.9835	40.12	0.1684	0.9665
40.02	0.4258	0.9824	50.85	0.2480	0.9672
40.08	0.7506	0.9841	60.22	0.3839	0.9660
40.83	0.8343	0.9847			

HA-HA or HD-HD systems (BAC = 4)

			P / bar	x ₁	y ₁
62.70	0.4810	0.9663			
64.33	0.6500	0.9662	14.95	0.0121	0.3262
67.22	0.8267	0.9664	25.90	0.0371	0.5729
70.33	0.8907	0.9683	40.74	0.0724	0.6973
74.00	0.9363	0.9711	49.92	0.0952	0.7396

Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3

T / K = 330.01

P / bar	x ₁	y ₁
10.00	0.0254	0.8413
20.30	0.0571	0.9117
30.27	0.0898	0.9332
40.77	0.1295	0.9434
53.94	0.1886	0.9473
64.95	0.2518	0.9476
74.95	0.3389	0.9453
80.20	0.4029	0.9422
85.40	0.5171	0.9377
88.00	0.6290	0.9334
90.20	0.7393	0.9273
92.20	0.8101	0.9202
93.00	0.8269	0.9148
93.80	0.8496	0.9042

Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3

T / K = 360.01

P / bar	x ₁	y ₁
15.18	0.0302	0.7598
35.66	0.0848	0.8737
54.80	0.1441	0.8994
69.70	0.1980	0.9068
84.60	0.2634	0.9060
100.40	0.3539	0.8972
108.60	0.4110	0.8891
115.30	0.4768	0.8748
120.10	0.5396	0.8589
122.40	0.5788	0.8467
125.30	0.6471	0.8157
125.90	0.6674	0.8054

Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3

T / K = 410.00

P / bar	x ₁	y ₁
61.16	0.1230	0.7673
76.40	0.1639	0.7876
87.10	0.1945	0.7954
94.20	0.2171	0.7990
104.20	0.2493	0.7991
117.60	0.2954	0.7931
125.50	0.3297	0.7869
135.80	0.3771	0.7719
145.00	0.4304	0.7549
149.50	0.4579	0.7400
154.90	0.5083	0.7036
156.70	0.5318	0.6904
158.90	0.6008	0.6391

Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3

T / K = 448.15

P / bar	x ₁	y ₁
40.40	0.0485	0.4477
55.80	0.0851	0.5580
70.30	0.1209	0.6123
84.70	0.1537	0.6431
99.10	0.1909	0.6625
114.90	0.2359	0.6639
130.10	0.2886	0.6513
144.80	0.3495	0.6245
156.30	0.4402	0.5606

Reiff, W.-E. - Roth, H. - Lucas, K., Phase equilibria in the binary system carbon disulfide-carbon dioxide, Fluid Phase Equilibria. 73 (1992) 323-338. doi:10.1016/0378-3812(92)80016-3

T / K = 473.15

P / bar	x ₁	y ₁
48.80	0.0495	0.3452
57.60	0.0695	0.4095
70.00	0.0955	0.4748
79.70	0.1194	0.5075
90.90	0.1439	0.5279
99.50	0.1732	0.5425
110.50	0.2001	0.5500
119.60	0.2272	0.5499
129.40	0.2629	0.5422
139.50	0.3091	0.5158

HA-HA or HD-HD systems (BAC = 4)

142.40	0.3288	0.5063	1173.0	0.4180
145.00	0.3490	0.4876	1183.0	0.4340

Enthalpy of mixing

Wormald, C.J. - Hodgetts, R.W., Measurements of HmE for {xCO₂+(1-x)CS₂} in the liquid region up to T=300.15 K and p=7.5 MPa, Fluid Phase Equilibria. 204 (2003) 303-308. doi:10.1016/S0378-3812(02)00266-2

T / K = 270.15

P / bar = 50.00

h^M / J.mol⁻¹

z₁

779.00	0.1570
822.00	0.1690
874.00	0.1880
917.00	0.1960
967.00	0.2110
1015.0	0.2290
1077.0	0.2500
1127.0	0.3200
1137.0	0.3730
1164.0	0.4320
1160.0	0.5340
1144.0	0.5760
1125.0	0.6190
1094.0	0.6850
1017.0	0.7720
978.00	0.8020
934.00	0.8250
865.00	0.8440
807.00	0.8580
755.00	0.8710

1156.0	0.5140
1136.0	0.5460
1107.0	0.5880
1074.0	0.6110
1061.0	0.6420
1002.0	0.6830
976.00	0.7080
911.00	0.7520
843.00	0.7710
776.00	0.8020
722.00	0.8250
666.00	0.8430
629.00	0.8580

Wormald, C.J. - Hodgetts, R.W., Measurements of HmE for {xCO₂+(1-x)CS₂} in the liquid region up to T=300.15 K and p=7.5 MPa, Fluid Phase Equilibria. 204 (2003) 303-308. doi:10.1016/S0378-3812(02)00266-2

T / K = 295.15

P / bar = 75.00

h^M / J.mol⁻¹

z ₁	
666.00	0.1710
710.00	0.1850
754.00	0.2010
808.00	0.2210
862.00	0.2450
927.00	0.2740
994.00	0.3120
1004.0	0.3290
1092.0	0.4050
1105.0	0.4760
1111.0	0.5310
1106.0	0.5750
1034.0	0.6190
982.00	0.6710
860.00	0.7300
664.00	0.8020
604.00	0.8250
554.00	0.8430

Wormald, C.J. - Hodgetts, R.W., Measurements of HmE for {xCO₂+(1-x)CS₂} in the liquid region up to T=300.15 K and p=7.5 MPa, Fluid Phase Equilibria. 204 (2003) 303-308. doi:10.1016/S0378-3812(02)00266-2

T / K = 290.15

P / bar = 75.00

h^M / J.mol⁻¹

z ₁	
724.00	0.1710
764.00	0.1820
806.00	0.1980
849.00	0.2140
896.00	0.2320
958.00	0.2540
1014.0	0.2800
1079.0	0.3120
1140.0	0.3620
1157.0	0.3820

Wormald, C.J. - Hodgetts, R.W., Measurements of HmE for {xCO₂+(1-x)CS₂} in the liquid region up to T=300.15 K and p=7.5 MPa, Fluid Phase Equilibria. 204 (2003) 303-308. doi:10.1016/S0378-3812(02)00266-2

T / K = 300.15

P / bar = 75.00

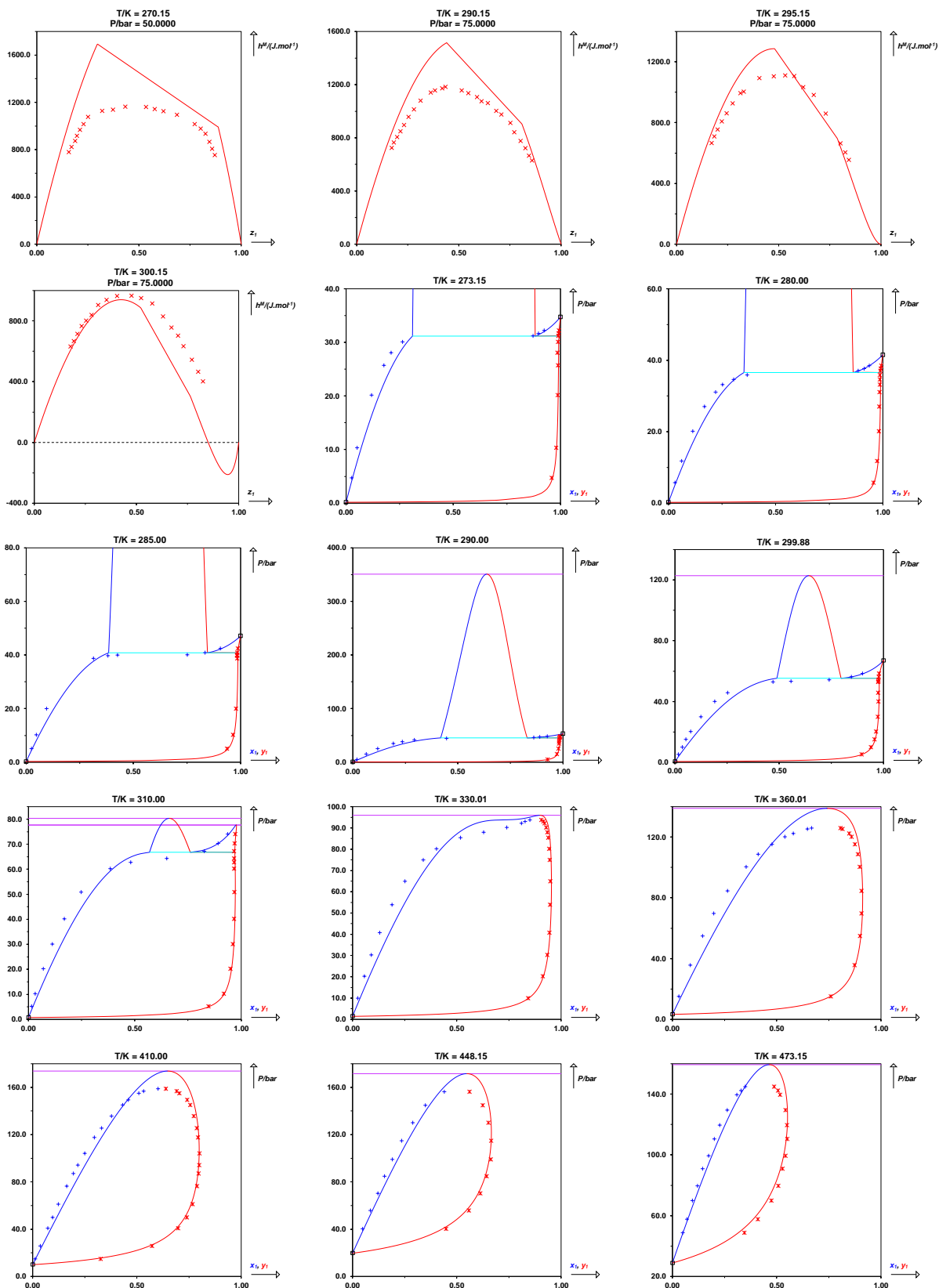
h^M / J.mol⁻¹

z ₁	
631.00	0.1770
668.00	0.1930

HA-HA or HD-HD systems (BAC = 4)

715.00	0.2110
766.00	0.2320
802.00	0.2540
840.00	0.2800
904.00	0.3120
939.00	0.3530
963.00	0.4050
965.00	0.4760
951.00	0.5220
915.00	0.5760
829.00	0.6300
757.00	0.6710
702.00	0.7030
633.00	0.7300
544.00	0.7710
466.00	0.8020
402.00	0.8250

HA-HA or HD-HD systems (BAC = 4)



CARBON DIOXIDE (1) + ETHYL ACETATE (2)

CAS	124-38-9	141-78-6
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	XEKOWRVHYACXOJ-UHFFFAOYSA-N
T_c / K	304.21	523.30
P_c / bar	73.83	38.80
ω	0.224	0.366

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -3.466$

$B/\text{MPa} = -557.7$

Deviations

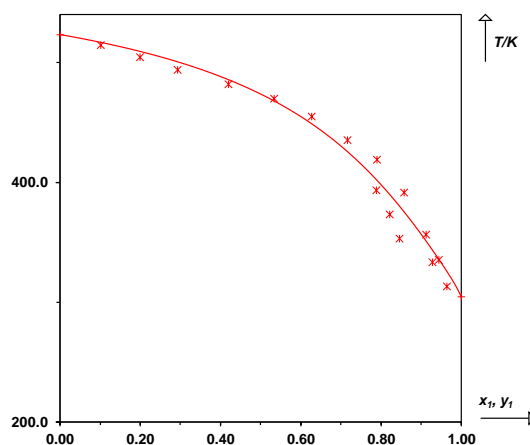
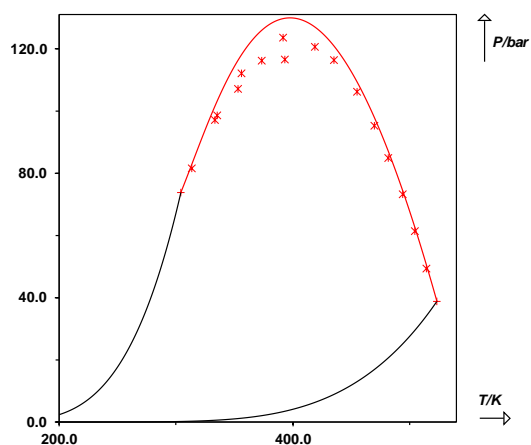
MAPE on $x = 28\%$

MAPE on $y = 15\%$

MAPE on $x_c = 13\%$

MAPE on $P_c = 4.5\%$

MAPE on $h^M = 16\%$



-----			49.64	0.7605	0.9915
Isothermal phase equilibrium data			52.25	0.7771	0.9911
-----			58.00	0.8159	0.9884
Wagner, Zdeněk - Pavlíček, Jan, Vapour-liquid equilibrium in the carbon dioxide—ethyl acetate system at high pressure, Fluid Phase Equilibria. 97 (1994) 119-126. doi:10.1016/0378-3812(94)85010-0			61.73	0.8401	0.9922
T / K = 303.15			66.00	0.8634	0.9915
P / bar	x ₁	y ₁	73.55	0.9052	0.9893
20.32	0.5684	0.9925	77.61	0.9238	0.9900
30.59	0.7088	0.9938	80.24	0.9347	0.9903
30.77	0.7104	0.9939	83.69	0.9473	0.9889
38.50	0.7917	0.9955	89.07	0.9684	0.9866
40.61	0.8096	0.9926	90.20	0.9752	0.9826
45.23	0.8518	0.9941			
45.42	0.8506	0.9945			
46.17	0.8572	0.9957			
53.21	0.9110	0.9942			
53.59	0.9084	0.9948			
63.25	0.9638	0.9957			
70.46	0.9930	0.9969			

Chrisochoou, A. - Schaber, K. - Bolz, U., Phase equilibria for enzyme-catalyzed reactions in supercritical carbon dioxide, Fluid Phase Equilibria. 108 (1995) 1-14. doi:10.1016/0378-3812(95)02696-C

-----			53.15		
T / K = 313.15					
P / bar	x ₁	y ₁			
9.200	0.1700	0.9740			
20.80	0.3530	0.9860			
27.00	0.4370	0.9880			
36.40	0.5550	0.9900			
45.50	0.6570	0.9910			
51.40	0.7230	0.9910			
57.00	0.7830	0.9910			
72.10	0.9130	0.9910			
75.50	0.9270	0.9900			
78.80	0.9580	0.9890			

Wagner, Zdeněk - Pavlíček, Jan, Vapour-liquid equilibrium in the carbon dioxide—ethyl acetate system at high pressure, Fluid Phase Equilibria. 97 (1994) 119-126. doi:10.1016/0378-3812(94)85010-0

-----			323.15		
T / K = 323.15					
P / bar	x ₁	y ₁			
20.47	0.4500	0.9878			
20.66	0.4464	0.9849			
29.64	0.5733	0.9900			
30.53	0.5815	0.9894			
39.07	0.6727	0.9898			
39.29	0.6739	0.9897			

-----			333.15		
T / K = 333.15					
P / bar	x ₁	y ₁			
16.20	0.2250	0.9610			
24.10	0.3200	0.9720			
31.30	0.3980	0.9720			
86.60	0.8140	0.9690			

Chrisochoou, A. - Schaber, K. - Bolz, U., Phase equilibria for enzyme-catalyzed reactions in supercritical carbon dioxide, Fluid Phase Equilibria. 108 (1995) 1-14. doi:10.1016/0378-3812(95)02696-C

-----			Enthalpy of mixing		
T / K = 313.15					
P / bar = 90.00					
h ^M / J.mol ⁻¹		z ₁			
-453.00		0.0870			
-947.00		0.1720			
-1361.0		0.2560			
-1924.0		0.3810			
-2196.0		0.4620			
-2524.0		0.5420			
-2861.0		0.6600			
-3042.0		0.7370			
-2983.0		0.8140			
-2660.0		0.8890			
-2262.0		0.9260			
-1584.0		0.9630			

Enthalpy of mixing

Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R. - Cabañas, Albertina, Excess molar enthalpies for mixtures of supercritical CO₂ and ethyl acetate and their role in supercritical fluid applications, The Journal of Chemical Thermodynamics. 51 (2012) 59-64. doi:10.1016/j.jct.2012.02.034

-----			313.15		
T / K = 313.15					
P / bar = 90.00					
h ^M / J.mol ⁻¹		z ₁			
-453.00		0.0870			
-947.00		0.1720			
-1361.0		0.2560			
-1924.0		0.3810			
-2196.0		0.4620			
-2524.0		0.5420			
-2861.0		0.6600			
-3042.0		0.7370			
-2983.0		0.8140			
-2660.0		0.8890			
-2262.0		0.9260			
-1584.0		0.9630			

Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R. - Cabañas, Albertina, Excess molar enthalpies for mixtures of supercritical CO₂ and ethyl acetate and their role in supercritical fluid applications, The Journal of Chemical

HA-HA or HD-HD systems (BAC = 4)

Thermodynamics.	51	(2012)	59-64.	-843.00	0.3670
doi:10.1016/j.jct.2012.02.034				-938.00	0.4630
T / K =	313.15			-990.00	0.5500
P / bar =	120.00			-1005.0	0.6290
$h^M / J.mol^{-1}$	z_1			-942.00	0.7000
-419.00	0.1230			-754.00	0.8250
-776.00	0.2350			-607.00	0.8800
-1015.0	0.3380			-414.00	0.9310
-1166.0	0.4320			-312.00	0.9550
-1288.0	0.5190				
-1368.0	0.5990				
-1403.0	0.6730				
-1349.0	0.7420				
-1265.0	0.8060				
-1099.0	0.8660				
-669.00	0.9490				
-371.00	0.9750				
Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R. - Cabañas, Albertina, Excess molar enthalpies for mixtures of supercritical CO2 and ethyl acetate and their role in supercritical fluid applications, The Journal of Chemical Thermodynamics.	51	(2012)	59-64.		
doi:10.1016/j.jct.2012.02.034					
T / K =	313.15				
P / bar =	150.00				
$h^M / J.mol^{-1}$	z_1				
-362.00	0.1320				
-632.00	0.2500				
-871.00	0.3560				
-1013.0	0.4520				
-1148.0	0.5390				
-1194.0	0.6180				
-1151.0	0.7240				
-1023.0	0.7880				
-948.00	0.8180				
-762.00	0.8750				
-518.00	0.9270				
-375.00	0.9530				
Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R. - Cabañas, Albertina, Excess molar enthalpies for mixtures of supercritical CO2 and ethyl acetate and their role in supercritical fluid applications, The Journal of Chemical Thermodynamics.	51	(2012)	59-64.		
doi:10.1016/j.jct.2012.02.034					
T / K =	323.15				
P / bar =	90.00				
$h^M / J.mol^{-1}$	z_1				
-881.00	0.0870				
-1586.0	0.1720				
-2202.0	0.2560				
-3338.0	0.4210				
-3724.0	0.5020				
-4136.0	0.5820				
-4455.0	0.6600				
-4489.0	0.7370				
-4313.0	0.8140				
-3349.0	0.8890				
-2290.0	0.9260				
-1153.0	0.9630				
Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R. - Cabañas, Albertina, Excess molar enthalpies for mixtures of supercritical CO2 and ethyl acetate and their role in supercritical fluid applications, The Journal of Chemical Thermodynamics.	51	(2012)	59-64.		
doi:10.1016/j.jct.2012.02.034					
T / K =	323.15				
P / bar =	120.00				
$h^M / J.mol^{-1}$	z_1				
-640.00	0.1230				
-1136.0	0.2350				
-1486.0	0.3380				
-1737.0	0.4320				
-1986.0	0.5590				
-2047.0	0.6360				
-2044.0	0.7420				
-1902.0	0.8060				
-1691.0	0.8660				
-1373.0	0.9220				
Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R. - Cabañas, Albertina, Excess molar enthalpies for mixtures of supercritical CO2 and ethyl acetate and their role in supercritical fluid applications, The Journal of Chemical Thermodynamics.	51	(2012)	59-64.		
doi:10.1016/j.jct.2012.02.034					
T / K =	313.15				
P / bar =	180.00				
$h^M / J.mol^{-1}$	z_1				
-258.00	0.0710				
-424.00	0.1370				
-693.00	0.2590				

-1133.0	0.9490	Thermodynamics.	51	(2012)	59-64.
-651.00	0.9750	doi:10.1016/j.jct.2012.02.034			
		T / K =	323.15		
		P / bar =	90.00		
		$h^M / \text{J.mol}^{-1}$	z_1		
		-863.00	0.0870		
		-1798.0	0.1720		
		-2551.0	0.2570		
		-3119.0	0.3390		
		-3609.0	0.4210		
		-4148.0	0.5420		
		-4356.0	0.6600		
		-4407.0	0.7370		
		-4150.0	0.8140		
		-3388.0	0.8890		
		-2228.0	0.9260		
		-1077.0	0.9630		
		Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R.			
		- Cabañas, Albertina, Excess molar enthalpies for mixtures			
		of supercritical CO ₂ and ethyl acetate and their role in			
		supercritical fluid applications, The Journal of Chemical			
		Thermodynamics.	51	(2012)	59-64.
		doi:10.1016/j.jct.2012.02.034			
		T / K =	323.15		
		P / bar =	150.00		
		$h^M / \text{J.mol}^{-1}$	z_1		
		-454.00	0.1320		
		-730.00	0.2500		
		-987.00	0.3690		
		-1141.0	0.4520		
		-1281.0	0.5390		
		-1357.0	0.6550		
		-1341.0	0.7240		
		-1315.0	0.7570		
		-1192.0	0.8800		
		-1046.0	0.8750		
		-734.00	0.9270		
		-553.00	0.9530		
		Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R.			
		- Cabañas, Albertina, Excess molar enthalpies for mixtures			
		of supercritical CO ₂ and ethyl acetate and their role in			
		supercritical fluid applications, The Journal of Chemical			
		Thermodynamics.	51	(2012)	59-64.
		doi:10.1016/j.jct.2012.02.034			
		T / K =	333.15		
		P / bar =	150.00		
		$h^M / \text{J.mol}^{-1}$	z_1		
		-565.00	0.1320		
		-949.00	0.2500		
		-1244.0	0.3560		
		-1433.0	0.4520		
		-1560.0	0.5390		
		-1656.0	0.6180		
		-1705.0	0.6900		
		-1679.0	0.7570		
		-1574.0	0.8180		
		-1337.0	0.8750		
		-942.00	0.9270		
		-756.00	0.9530		

		Critical point			

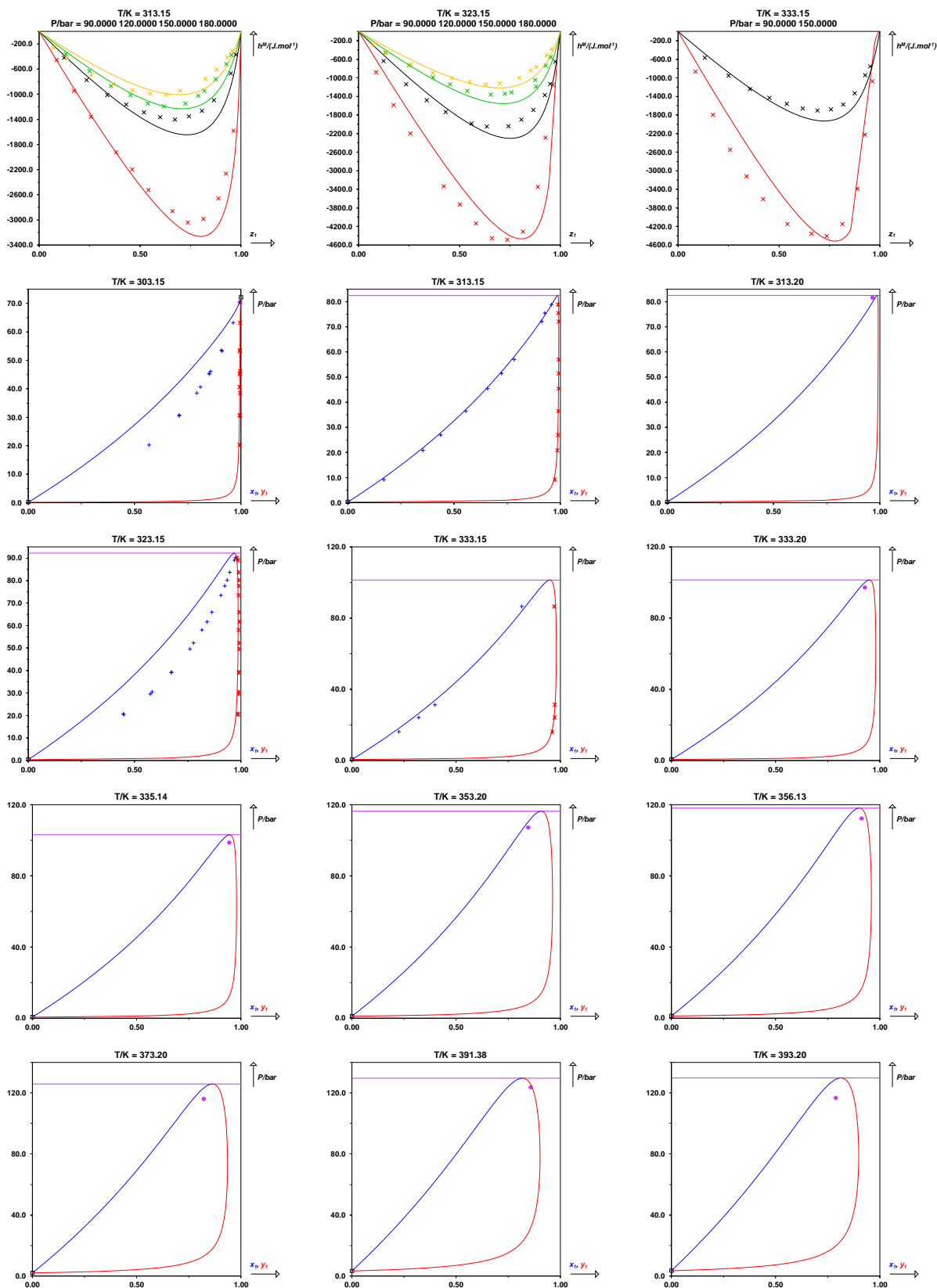
		Byun, Hun-Soo - Choi, Min-Yong - Lim, Jong-Sung, High-			
		pressure phase behavior and modeling of binary mixtures			
		for alkyl acetate in supercritical carbon dioxide, The			
		Journal of Supercritical Fluids.	37	(2006)	323-332.
		doi:10.1016/j.supflu.2005.10.007			
		T / K	P / bar	x_1	
		313.20	81.60	0.9640	
		333.20	97.00	0.9280	
		Zahran, Fouad - Pando, Concepción - Renuncio, Juan A.R.			
		- Cabañas, Albertina, Excess molar enthalpies for mixtures			
		of supercritical CO ₂ and ethyl acetate and their role in			
		supercritical fluid applications, The Journal of Chemical			

353.20	107.10	0.8460
373.20	116.10	0.8210
393.20	116.60	0.7880

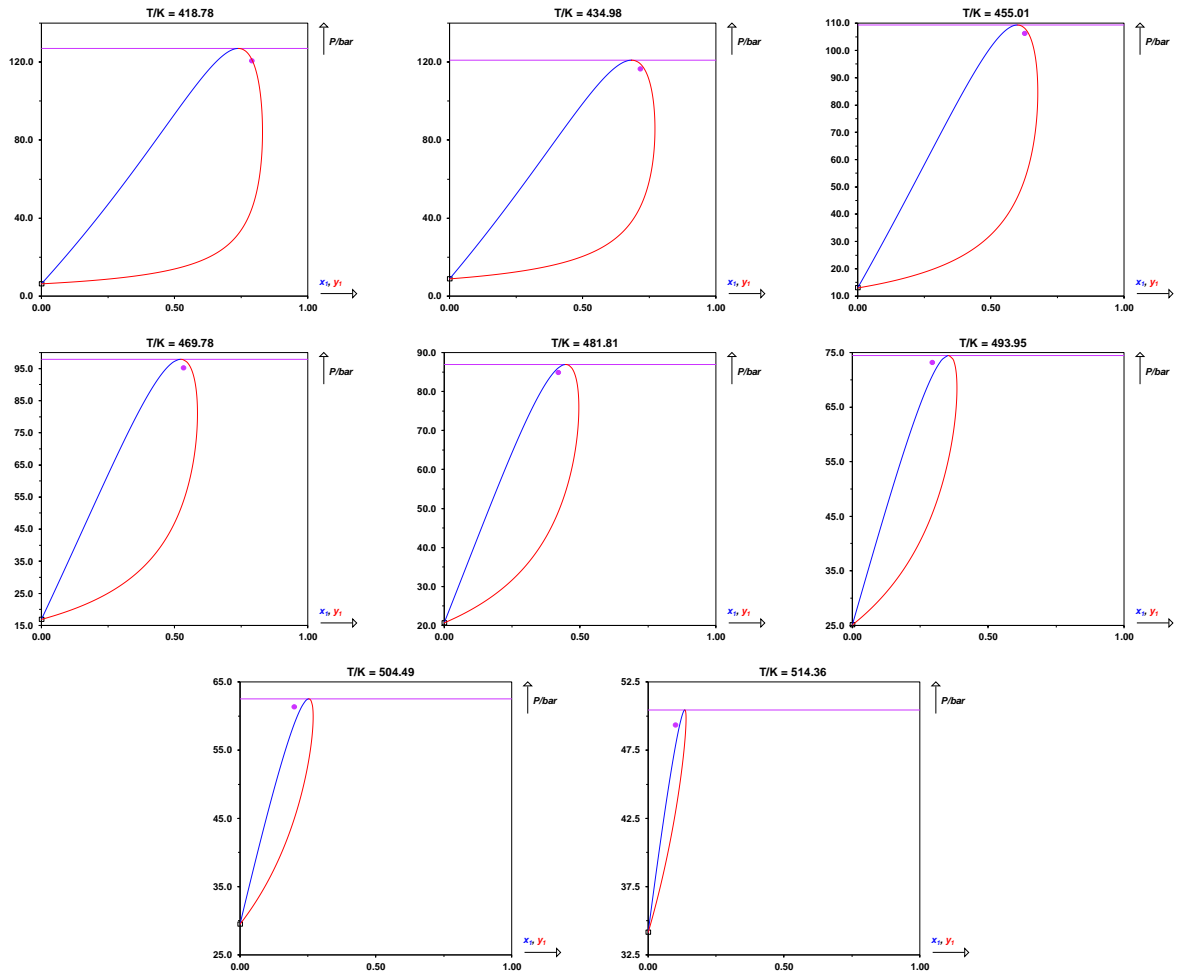
Juntarachat, Niramol - Privat, Romain - Coniglio, Lucie - Jaubert, Jean-Noël, Development of a Predictive Equation of State for CO₂ + Ethyl Ester Mixtures Based on Critical Points Measurements, Journal of Chemical & Engineering Data. 59 (2014) 3205-3219. doi:10.1021/je5002494

T / K	P / bar	x ₁
335.14	98.59	0.9443
356.13	112.08	0.9115
391.38	123.62	0.8577
418.78	120.54	0.7902
434.98	116.36	0.7158
455.01	106.10	0.6271
469.78	95.14	0.5328
481.81	84.88	0.4198
493.95	73.12	0.2934
504.49	61.30	0.1988
514.36	49.33	0.1011

HA-HA or HD-HD systems (BAC = 4)



HA-HA or HD-HD systems (BAC = 4)



CARBON DIOXIDE (1) + DIMETHYL CARBONATE (2)

CAS	124-38-9	616-38-6
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	IEJIGPNLZYLLBP-UHFFFAOYSA-N
T_c / K	304.21	548.00
P_c / bar	73.83	45.00
ω	0.224	0.385

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -15.20$

$B/\text{MPa} = -172.3$

Deviations

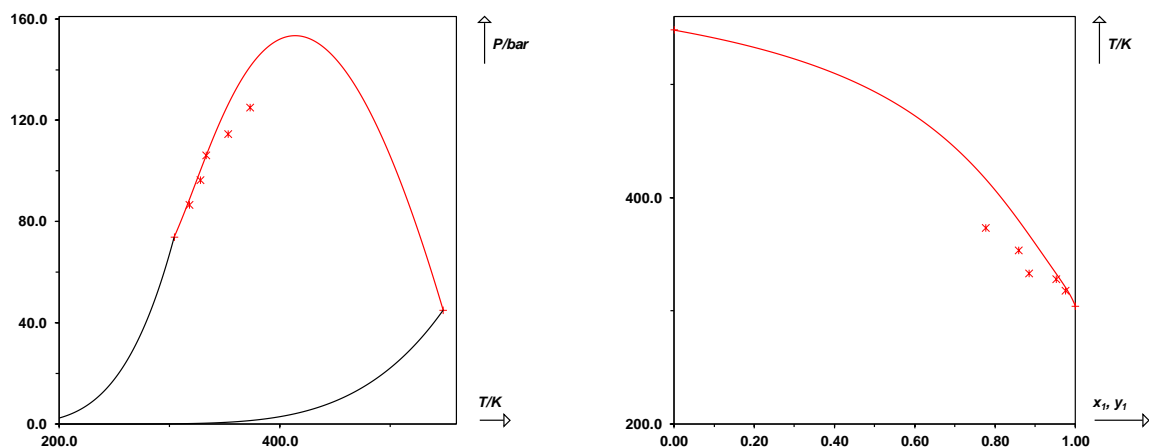
MAPE on $x = 6.1\%$

MAPE on $y = 20\%$

MAPE on $x_c = 21\%$

MAPE on $P_c = 5.8\%$

MAPE on $h^M = 7.6\%$



-----			P / bar	x ₁	y ₁
Isothermal phase equilibrium data			2.410	0.0470	0.9610
-----			9.790	0.1780	0.9850
Lee, Min Hee - Yim, Joon-Hyuk - Kang, Jeong Won - Lim, Jong Sung, Measurement of VLE data of carbon dioxide+dimethyl carbonate system for the direct synthesis of dimethyl carbonate using supercritical CO ₂ and methanol, Fluid Phase Equilibria. 318 (2012) 77-82. doi:10.1016/j.fluid.2012.01.020			14.34	0.2640	0.9880
T / K = 278.15			28.27	0.4740	0.9920
P / bar	x ₁	y ₁	40.68	0.6670	0.9950
2.300	0.0790	0.9840	64.12	0.9330	0.9970
6.000	0.2220	0.9940	Im, Jihoon - Kim, Myungyoun - Lee, Jaewon - Kim, Hwayong, Vapor-Liquid Equilibria of Binary Carbon Dioxide + Alkyl Carbonate Mixture Systems, Journal of Chemical & Engineering Data. 49 (2004) 243-245. doi:10.1021/je034089a		
9.690	0.3580	0.9960	T / K = 310.27		
29.30	0.8470	0.9980	P / bar	x ₁	y ₁
36.48	0.9410	0.9990	8.630	0.1431	0.9525
Lee, Min Hee - Yim, Joon-Hyuk - Kang, Jeong Won - Lim, Jong Sung, Measurement of VLE data of carbon dioxide+dimethyl carbonate system for the direct synthesis of dimethyl carbonate using supercritical CO ₂ and methanol, Fluid Phase Equilibria. 318 (2012) 77-82. doi:10.1016/j.fluid.2012.01.020			18.97	0.3019	0.9818
T / K = 283.15			25.56	0.3919	0.9885
P / bar	x ₁	y ₁	31.90	0.4809	0.9879
2.800	0.0670	0.9770	37.18	0.5473	0.9907
6.700	0.1870	0.9900	43.80	0.6273	0.9917
29.99	0.7720	0.9960	55.47	0.7648	0.9930
33.78	0.8450	0.9970	67.14	0.8867	0.9931
38.70	0.9160	0.9980	72.46	0.9290	0.9934
Lee, Min Hee - Yim, Joon-Hyuk - Kang, Jeong Won - Lim, Jong Sung, Measurement of VLE data of carbon dioxide+dimethyl carbonate system for the direct synthesis of dimethyl carbonate using supercritical CO ₂ and methanol, Fluid Phase Equilibria. 318 (2012) 77-82. doi:10.1016/j.fluid.2012.01.020			Lee, Min Hee - Yim, Joon-Hyuk - Kang, Jeong Won - Lim, Jong Sung, Measurement of VLE data of carbon dioxide+dimethyl carbonate system for the direct synthesis of dimethyl carbonate using supercritical CO ₂ and methanol, Fluid Phase Equilibria. 318 (2012) 77-82. doi:10.1016/j.fluid.2012.01.020		
T / K = 293.15			T / K = 313.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
1.900	0.0350	0.9590	3.930	0.0610	0.9580
9.310	0.1900	0.9900	8.620	0.1280	0.9750
13.96	0.3100	0.9920	16.55	0.2470	0.9830
23.03	0.4720	0.9940	30.48	0.4290	0.9890
32.54	0.6470	0.9960	38.27	0.5350	0.9920
49.64	0.9160	0.9980	49.64	0.6820	0.9930
Lee, Min Hee - Yim, Joon-Hyuk - Kang, Jeong Won - Lim, Jong Sung, Measurement of VLE data of carbon dioxide+dimethyl carbonate system for the direct synthesis of dimethyl carbonate using supercritical CO ₂ and methanol, Fluid Phase Equilibria. 318 (2012) 77-82. doi:10.1016/j.fluid.2012.01.020			Im, Jihoon - Kim, Myungyoun - Lee, Jaewon - Kim, Hwayong, Vapor-Liquid Equilibria of Binary Carbon Dioxide + Alkyl Carbonate Mixture Systems, Journal of Chemical & Engineering Data. 49 (2004) 243-245. doi:10.1021/je034089a		
T / K = 303.15			T / K = 320.36		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
8.270	0.1140	0.9388	8.270	0.1140	0.9388
16.64	0.2250	0.9699	16.64	0.2250	0.9699
25.53	0.3356	0.9778	25.53	0.3356	0.9778
32.19	0.4144	0.9850	32.19	0.4144	0.9850
42.50	0.5269	0.9881	42.50	0.5269	0.9881

57.57	0.6820	0.9885
70.84	0.8162	0.9888
76.97	0.8597	0.9879
81.40	0.8954	0.9866

Lee, Min Hee - Yim, Joon-Hyuk - Kang, Jeong Won - Lim, Jong Sung, Measurement of VLE data of carbon dioxide+dimethyl carbonate system for the direct synthesis of dimethyl carbonate using supercritical CO₂ and methanol, Fluid Phase Equilibria. 318 (2012) 77-82. doi:10.1016/j.fluid.2012.01.020

T / K = 333.15

P / bar	x ₁	y ₁
6.210	0.0570	0.9350
19.79	0.2170	0.9740
33.78	0.3500	0.9800
53.53	0.5480	0.9840
64.67	0.6470	0.9850
82.32	0.7890	0.9860
91.84	0.8550	0.9830
94.46	0.8720	0.9820

Im, Jihoon - Kim, Myungyoun - Lee, Jaewon - Kim, Hwayong, Vapor-Liquid Equilibria of Binary Carbon Dioxide + Alkyl Carbonate Mixture Systems, Journal of Chemical & Engineering Data. 49 (2004) 243-245. doi:10.1021/jc034089a

T / K = 340.27

P / bar	x ₁	y ₁
10.19	0.1076	0.9276
24.03	0.2450	0.9645
36.84	0.3616	0.9741
48.66	0.4667	0.9773
58.52	0.5445	0.9786
70.82	0.6412	0.9787
82.69	0.7353	0.9776
94.13	0.8141	0.9727
99.96	0.8569	0.9630

Chen, L. - Zhu, R.J. - Fang, Y. - Yuan, P.F. - Cao, L.Q. - Tian, Y.L., Vapor-Liquid Equilibrium Data for Carbon Dioxide+Dimethyl Carbonate Binary System, Wuli Huaxue Xuebao. 29 (2013) 11-16.

T / K = 353.00

P / bar	x ₁	y ₁
39.80	0.3810	0.9831
51.20	0.4656	0.9811
65.20	0.5549	0.9797
84.50	0.6563	0.9748
105.10	0.7577	0.9481
118.70	0.8332	0.9059

Chen, L. - Zhu, R.J. - Fang, Y. - Yuan, P.F. - Cao, L.Q. - Tian, Y.L., Vapor-Liquid Equilibrium Data for Carbon Dioxide+Dimethyl Carbonate Binary System, Wuli Huaxue Xuebao. 29 (2013) 11-16.

T / K = 373.00

P / bar	x ₁	y ₁
44.60	0.3890	0.9782
54.80	0.4598	0.9760
66.20	0.5226	0.9762
76.70	0.5763	0.9688
88.40	0.6195	0.9651
99.40	0.6538	0.9600
111.30	0.6929	0.9504

Chen, L. - Zhu, R.J. - Fang, Y. - Yuan, P.F. - Cao, L.Q. - Tian, Y.L., Vapor-Liquid Equilibrium Data for Carbon Dioxide+Dimethyl Carbonate Binary System, Wuli Huaxue Xuebao. 29 (2013) 11-16.

T / K = 393.00

P / bar	x ₁	y ₁
55.70	0.4143	0.9559
65.70	0.4699	0.9600
80.70	0.5245	0.9526
95.60	0.5787	0.9491
110.60	0.6287	0.9294
125.70	0.6878	0.9137
137.50	0.7459	0.8935

Enthalpy of mixing

Matsuda, Hiroyuki - Yoshii, Shigetaka - Nagashima, Akinori - Kurihara, Kiyofumi - Ochi, Kenji, Excess Molar Enthalpies of the Binary Carbon Dioxide + Dimethyl Carbonate System at Temperatures of (298.15 to 308.15) K and Pressures of (5.0 to 7.5) MPa, Journal of Chemical & Engineering Data. 50 (2005) 1419-1424. doi:10.1021/jc050089u

T / K = 298.15

P / bar = 50.00

h ^M / J.mol ⁻¹	z ₁
-865.00	0.0793
-1787.0	0.1538
-2659.0	0.2240
-3480.0	0.2902
-4257.0	0.3528
-4806.0	0.4121
-5560.0	0.4683
-6179.0	0.5216
-6663.0	0.5723
-7173.0	0.6206
-7625.0	0.6666

HA-HA or HD-HD systems (BAC = 4)

-8014.0	0.7104	-1834.0	0.1548
-8345.0	0.7523	-2591.0	0.2253
-8669.0	0.7924	-3339.0	0.2918
-8924.0	0.8307	-4139.0	0.3546
-8756.0	0.8382	-4821.0	0.4139
-7087.0	0.8674	-5437.0	0.4702
-5290.0	0.9026	-5913.0	0.5235
-3285.0	0.9364	-6431.0	0.5742
-1605.0	0.9688	-6870.0	0.6223
64.00	0.9969	-7338.0	0.6682
		-7732.0	0.7120
		-8042.0	0.7537
		-8269.0	0.7936
		-8461.0	0.8318
		-8422.0	0.8392
		-7900.0	0.8466
		-6765.0	0.8683
		-4920.0	0.9033
		-3067.0	0.9368
		-1383.0	0.9691
Matsuda, Hiroyuki - Yoshii, Shigetaka - Nagashima, Akinori - Kurihara, Kiyofumi - Ochi, Kenji, Excess Molar Enthalpies of the Binary Carbon Dioxide + Dimethyl Carbonate System at Temperatures of (298.15 to 308.15) K and Pressures of (5.0 to 7.5) MPa, Journal of Chemical & Engineering Data. 50 (2005) 1419-1424. doi:10.1021/je050089u		Matsuda, Hiroyuki - Yoshii, Shigetaka - Nagashima, Akinori - Kurihara, Kiyofumi - Ochi, Kenji, Excess Molar Enthalpies of the Binary Carbon Dioxide + Dimethyl Carbonate System at Temperatures of (298.15 to 308.15) K and Pressures of (5.0 to 7.5) MPa, Journal of Chemical & Engineering Data. 50 (2005) 1419-1424. doi:10.1021/je050089u	
T / K = 298.15		T / K = 308.15	
P / bar = 60.00		P / bar = 50.00	
$h^M / J.mol^{-1}$ z_1		$h^M / J.mol^{-1}$ z_1	
-1626.0	0.1557	-1967.0	0.1537
-2335.0	0.2265	-2761.0	0.2239
-3334.0	0.2932	-3576.0	0.2901
-3788.0	0.3561	-5003.0	0.4120
-4343.0	0.4156	-5674.0	0.4682
-4974.0	0.4718	-6236.0	0.5215
-5395.0	0.5252	-7259.0	0.6205
-5869.0	0.5758	-8064.0	0.7103
-6342.0	0.6239	-8095.0	0.7189
-6759.0	0.6697	-7874.0	0.7273
-7051.0	0.7134	-5842.0	0.7923
-7255.0	0.7550	-3575.0	0.8674
-7515.0	0.7947	-1634.0	0.9364
-7755.0	0.8327	-22.00	0.9877
-7833.0	0.8691	112.00	0.9939
-7913.0	0.9039		
-7801.0	0.9502		
-7458.0	0.9693		
-3615.0	0.9817		
Matsuda, Hiroyuki - Yoshii, Shigetaka - Nagashima, Akinori - Kurihara, Kiyofumi - Ochi, Kenji, Excess Molar Enthalpies of the Binary Carbon Dioxide + Dimethyl Carbonate System at Temperatures of (298.15 to 308.15) K and Pressures of (5.0 to 7.5) MPa, Journal of Chemical & Engineering Data. 50 (2005) 1419-1424. doi:10.1021/je050089u		Matsuda, Hiroyuki - Yoshii, Shigetaka - Nagashima, Akinori - Kurihara, Kiyofumi - Ochi, Kenji, Excess Molar Enthalpies of the Binary Carbon Dioxide + Dimethyl Carbonate System at Temperatures of (298.15 to 308.15) K and	
T / K = 303.15			
P / bar = 55.00			
$h^M / J.mol^{-1}$ z_1			
-896.00	0.0798		

Pressures of (5.0 to 7.5) MPa, Journal of Chemical & Engineering Data. 50 (2005) 1419-1424.
doi:10.1021/je050089u

T / K = 308.15

P / bar = 60.00

$h^M / \text{J.mol}^{-1}$	z_1
-1782.0	0.1556
-3307.0	0.2931
-4696.0	0.4154
-5228.0	0.4717
-6267.0	0.5757
-6714.0	0.6238
-7404.0	0.7132
-7713.0	0.7549
-7982.0	0.7946
-8094.0	0.8326
-6291.0	0.8690
-2992.0	0.9372
-1153.0	0.9692

Matsuda, Hiroyuki - Yoshii, Shigetaka - Nagashima, Akinori - Kurihara, Kiyofumi - Ochi, Kenji, Excess Molar Enthalpies of the Binary Carbon Dioxide + Dimethyl Carbonate System at Temperatures of (298.15 to 308.15) K and Pressures of (5.0 to 7.5) MPa, Journal of Chemical & Engineering Data. 50 (2005) 1419-1424.
doi:10.1021/je050089u

T / K = 308.15

P / bar = 70.00

$h^M / \text{J.mol}^{-1}$	z_1
-870.00	0.0812
-1626.0	0.1572
-2304.0	0.2285
-3020.0	0.2956
-3592.0	0.3587
-4190.0	0.4184
-4626.0	0.4747
-5143.0	0.5280
-5515.0	0.5786
-5933.0	0.6266
-6252.0	0.6723
-6527.0	0.7157
-6760.0	0.7571
-6911.0	0.7966
-7053.0	0.8343
-7136.0	0.8703
-7049.0	0.9049
-6953.0	0.9249
-5649.0	0.9443
-5190.0	0.9507
-3208.0	0.9697

Critical point

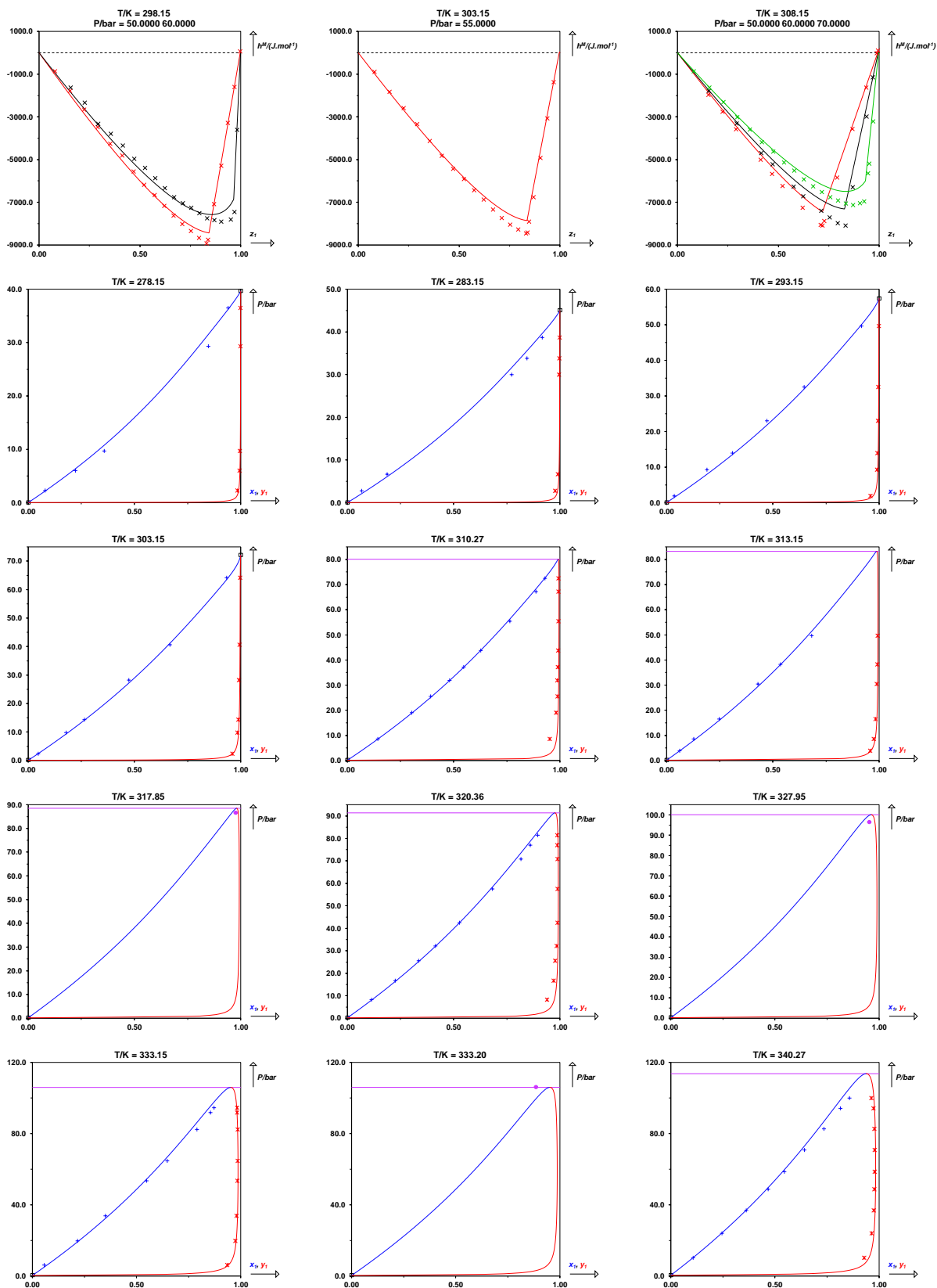
Hou, Yucui - Chen, Xiaoting - Ren, Shuhang - Song, Zhangzuo - Wu, Weize, Phase Behavior, Densities, and Isothermal Compressibility of (Carbon Dioxide + Dimethyl Carbonate), Journal of Chemical & Engineering Data. 55 (2010) 1580-1587. doi:10.1021/je900691n

T / K	P / bar	x_1
317.85	86.60	0.9758
327.95	96.40	0.9519

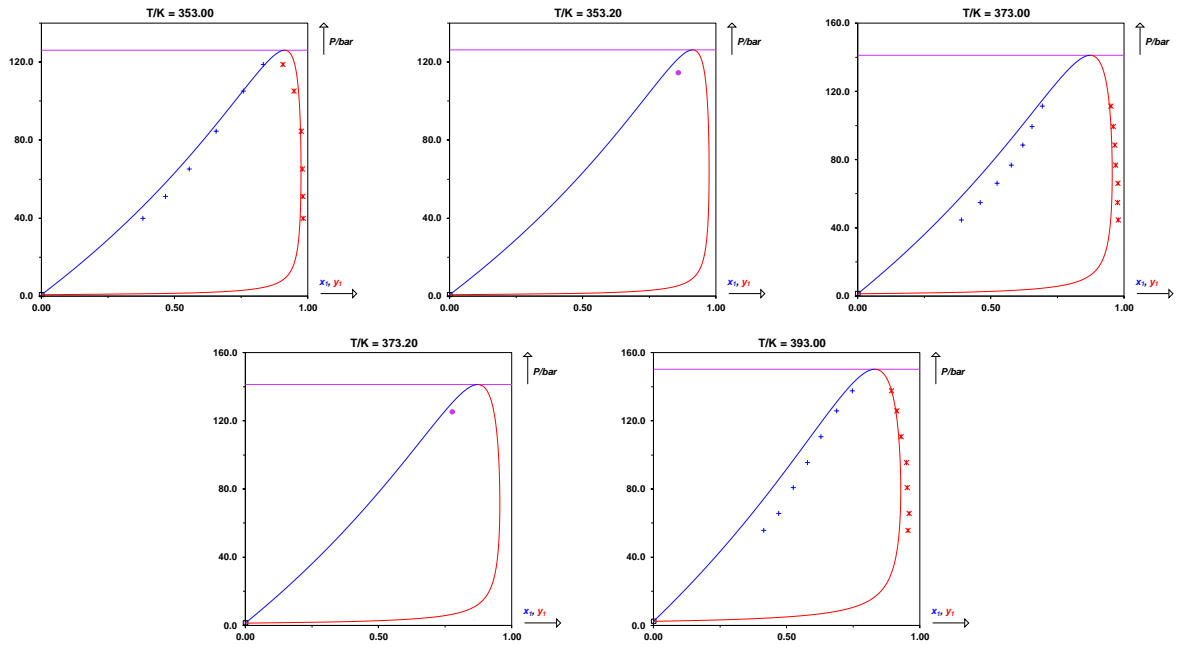
Sun, Yongju - Li, Yanfen - Zhou, Jianguo - Zhu, Rongjiao - Tian, Yiling, Experimental determination and calculation of the critical curves for the binary systems of CO₂ containing ketone, alkane, ester and alcohol, respectively, Fluid Phase Equilibria. 307 (2011) 72-77. doi:10.1016/j.fluid.2011.05.005

T / K	P / bar	x_1
333.20	106.00	0.8852
353.20	114.50	0.8590
373.20	125.10	0.7772

HA-HA or HD-HD systems (BAC = 4)



HA-HA or HD-HD systems (BAC = 4)



DIMETHYL ETHER (1) + SULFUR DIOXIDE (2)

CAS	115-10-6	7446-09-5
InChiKey	LCGLNKUTAGEVQW-UHFFFAOYSA-N	RAHZWNYVWXNFOC-UHFFFAOYSA-N
T_c / K	400.10	430.75
P_c / bar	53.70	78.84
ω	0.200	0.245

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -207.9$

$B/\text{MPa} = -575.4$

Deviations

MAPE on $x = 9.4\%$

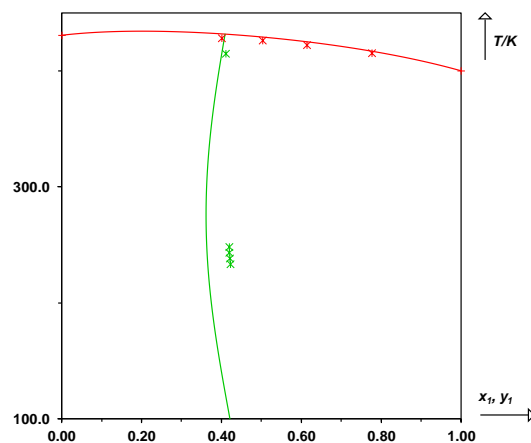
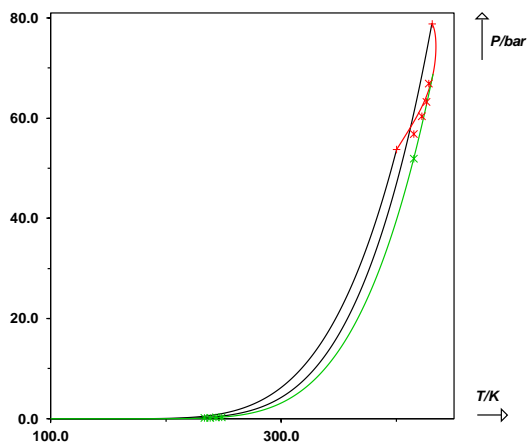
MAPE on $y = 11\%$

MAPE on $x_c = 17\%$

MAPE on $P_c = 2.8\%$

MAPE on $x_{az} = 8.9\%$

MAPE on $P_{az} = 7.7\%$



-----				0.4151	0.6790	0.9340	
Isothermal phase equilibrium data				0.5729	0.7820	0.9790	

Pupezin, J. - Ribnikar, S. - Knezevic, Z. - Dokic, V., Liquid-vapor equilibrium and thermodynamic properties of the system sulfur dioxide + dimethyl ether, Bull. Boris Kidric Inst. Nucl. Sci. 17 (1966) 297-309.				Pupezin, J. - Ribnikar, S. - Knezevic, Z. - Dokic, V., Liquid-vapor equilibrium and thermodynamic properties of the system sulfur dioxide + dimethyl ether, Bull. Boris Kidric Inst. Nucl. Sci. 17 (1966) 297-309.			
T / K = 233.15				T / K = 248.15			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
0.2017	0.0670	0.0100		0.4605	0.0720	0.0170	
0.1786	0.1520	0.0320		0.4143	0.1560	0.0420	
0.1351	0.2980	0.1480		0.3246	0.3010	0.1730	
0.1200	0.3600	0.2350		0.2960	0.3610	0.2600	
0.1141	0.4050	0.3600		0.2877	0.4060	0.3700	
0.1133	0.4220	0.4220	AZEO	0.2865	0.4190	0.4190	AZEO
0.1237	0.5000	0.6720		0.3044	0.4960	0.6340	
0.1755	0.5960	0.8720		0.3897	0.5850	0.8300	
0.2538	0.6850	0.9530		0.5227	0.6760	0.9250	
0.3555	0.7880	0.9880		0.7127	0.7790	0.9740	
Pupezin, J. - Ribnikar, S. - Knezevic, Z. - Dokic, V., Liquid-vapor equilibrium and thermodynamic properties of the system sulfur dioxide + dimethyl ether, Bull. Boris Kidric Inst. Nucl. Sci. 17 (1966) 297-309.				Noles, Joe R. - Zollweg, John A., Isothermal vapor-liquid equilibrium for dimethyl ether + sulfur dioxide, Fluid Phase Equilibria. 66 (1991) 275-289. doi:10.1016/0378-3812(91)85061-X			
T / K = 238.15				T / K = 283.15			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
0.2693	0.0680	0.0120		1.980	0.1732	0.0702	
0.2407	0.1530	0.0360		1.820	0.2391	0.1215	
0.1838	0.2990	0.1580		1.630	0.3224	0.2249	
0.1647	0.3600	0.2440		1.540	0.3905	0.3533	
0.1582	0.4050	0.3620		1.530	0.4420	0.4620	
0.1572	0.4210	0.4210	AZEO	1.660	0.5304	0.6511	
0.1700	0.5010	0.6600		2.030	0.6391	0.8315	
0.2322	0.5950	0.8620		2.470	0.7355	0.9230	
0.3264	0.6850	0.9430		3.370	0.9180	0.9855	
0.4546	0.7860	0.9840					
Pupezin, J. - Ribnikar, S. - Knezevic, Z. - Dokic, V., Liquid-vapor equilibrium and thermodynamic properties of the system sulfur dioxide + dimethyl ether, Bull. Boris Kidric Inst. Nucl. Sci. 17 (1966) 297-309.				Noles, Joe R. - Zollweg, John A., Isothermal vapor-liquid equilibrium for dimethyl ether + sulfur dioxide, Fluid Phase Equilibria. 66 (1991) 275-289. doi:10.1016/0378-3812(91)85061-X			
T / K = 243.15				T / K = 323.59			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
0.3545	0.0700	0.0140		7.980	0.0980	0.0468	
0.3183	0.1540	0.0390		7.690	0.1482	0.0791	
0.2461	0.3000	0.1630		7.000	0.2635	0.1819	
0.2224	0.3610	0.2500		6.590	0.3547	0.3079	
0.2152	0.4050	0.3660		6.480	0.4463	0.4577	
0.2141	0.4200	0.4200	AZEO	6.670	0.5169	0.5802	
0.2293	0.4990	0.6470		7.040	0.5853	0.6877	
0.3027	0.5890	0.8450		8.350	0.7304	0.8615	

Noles, Joe R. - Zollweg, John A., Isothermal vapor-liquid equilibrium for dimethyl ether + sulfur dioxide, Fluid Phase Equilibria. 66 (1991) 275-289. doi:10.1016/0378-3812(91)85061-X

T / K = 363.15

P / bar	x ₁	y ₁
20.00	0.1977	0.1360
19.31	0.2598	0.1968
18.62	0.3436	0.2989
18.27	0.4137	0.3986
18.20	0.4678	0.4751
21.44	0.7370	0.8135
22.80	0.8023	0.8721

Noles, Joe R. - Zollweg, John A., Isothermal vapor-liquid equilibrium for dimethyl ether + sulfur dioxide, Fluid Phase Equilibria. 66 (1991) 275-289. doi:10.1016/0378-3812(91)85061-X

T / K = 405.00

P / bar	x ₁	y ₁
48.60	0.0769	0.0598
45.48	0.2093	0.1776
43.79	0.2962	0.2826
42.86	0.3995	0.4036
43.00	0.5084	0.5295
44.94	0.6576	0.6885
46.09	0.7051	0.7425
48.58	0.7909	0.8226
50.25	0.8414	0.8626
52.79	0.9019	0.9117
53.61	0.9228	0.9302

Noles, Joe R. - Zollweg, John A., Isothermal vapor-liquid equilibrium for dimethyl ether + sulfur dioxide, Fluid Phase Equilibria. 66 (1991) 275-289. doi:10.1016/0378-3812(91)85061-X

T / K = 415.00

P / bar	x ₁	y ₁	
57.64	0.1021	0.0847	
55.35	0.1865	0.1668	
53.08	0.2987	0.2825	
51.94	0.4104	0.4092	
51.94	0.4110	0.4110	AZEO
52.65	0.5736	0.5910	
54.01	0.6494	0.6732	
55.77	0.7209	0.7405	
55.91	0.7300	0.7449	
56.48	0.7604	0.7713	

Noles, Joe R. - Zollweg, John A., Isothermal vapor-liquid equilibrium for dimethyl ether + sulfur dioxide, Fluid

Phase Equilibria. 66 (1991) 275-289. doi:10.1016/0378-3812(91)85061-X

T / K = 425.00

P / bar	x ₁	y ₁
68.03	0.1041	0.0932
65.72	0.1811	0.1639
64.25	0.2362	0.2240
62.90	0.3017	0.2929
62.24	0.3501	0.3457
61.79	0.4070	0.4045
61.71	0.4641	0.4686
61.86	0.5044	0.5086

Noles, Joe R. - Zollweg, John A., Isothermal vapor-liquid equilibrium for dimethyl ether + sulfur dioxide, Fluid Phase Equilibria. 66 (1991) 275-289. doi:10.1016/0378-3812(91)85061-X

T / K = 428.00

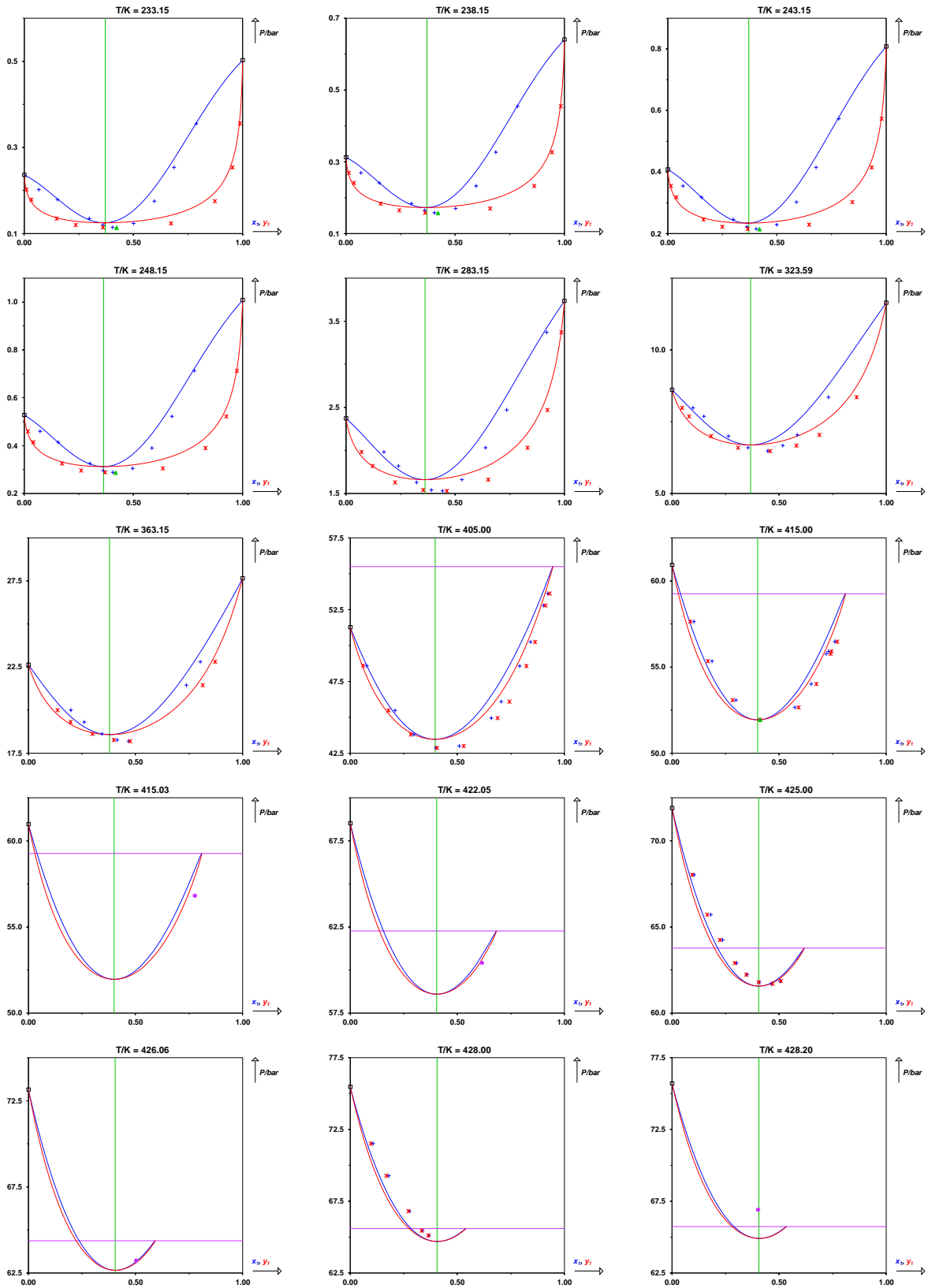
P / bar	x ₁	y ₁
71.52	0.1059	0.0962
69.28	0.1791	0.1687
66.82	0.2773	0.2709
65.46	0.3373	0.3333
65.11	0.3670	0.3648

Critical point

Glowka, S. - Zawisza, A.C., Liquid-vapor equilibria and thermodynamic functions of methyl ethyl ether-sulfur dioxide system up to 300.deg. and 77.81 atm, Bulletin de l'Academie Polonaise des Sciences, Serie des Sciences Chimiques. 18 (1970) 555-560.

T / K	P / bar	x ₁
415.03	56.80	0.7768
422.05	60.40	0.6139
426.06	63.22	0.5036
428.20	66.91	0.4014

HA-HA or HD-HD systems (BAC = 4)



DIFLUOROMETHANE (1) + 1,1,1,2-TETRAFLUOROETHANE (2)

CAS	75-10-5	811-97-2
InChiKey	RWRIWBAlICGTTQ-UHFFFAOYSA-N	LVGUZGTVOIAKKC-UHFFFAOYSA-N
T_c / K	351.26	374.18
P_c / bar	57.84	40.56
ω	0.277	0.327

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 8.442

B/MPa = 22.92

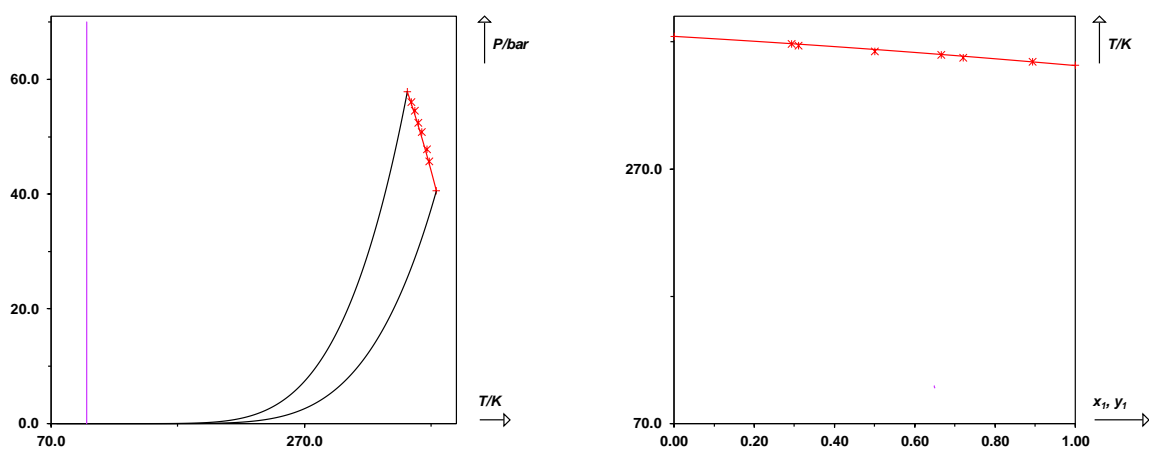
Deviations

MAPE on x = 3.7 %

MAPE on y = 3.4 %

MAPE on x_c = 7.4 %

MAPE on P_c = 1.2 %



Isothermal phase equilibrium data

Nagel, M. - Bier, K., Vapor-liquid equilibriums of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 203.15

P / bar	y_1
0.1492	0.5814
0.2301	0.8204
0.3006	0.9342

Nagel, M. - Bier, K., Vapor-liquid equilibriums of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 203.15

P / bar	x_1
0.1487	0.2308
0.2296	0.5124
0.2989	0.7695

Nagel, M. - Bier, K., Vapor-liquid equilibriums of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 253.15

P / bar	y_1
1.951	0.4615
2.721	0.7479
3.435	0.9054

Nagel, M. - Bier, K., Vapor-liquid equilibriums of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 253.15

P / bar	x_1
1.945	0.2315
2.715	0.5117
3.437	0.7735

Kim, C.N. - Park, Y.M., Vapor-Liquid Equilibrium of HFC-32/134a And HFC-125/134a Systems, Int. J. Thermophys. 20 (1999) 519-530. doi:10.1023/A:1022605104490

T / K = 263.15

P / bar	x_1	y_1
2.758	0.2021	0.4004
3.490	0.4035	0.6249
4.250	0.5946	0.7798
5.021	0.7876	0.9053

Chung, Eui-Yeop - Kim, Min Soo, Vapor-Liquid Equilibria for the Difluoromethane (HFC-32) + 1,1,1,2-Tetrafluoroethane (HFC-134a) System, Journal of

Chemical & Engineering Data. 42 (1997) 1126-1128. doi:10.1021/je970071m

T / K = 263.15

P / bar	x_1	y_1
2.889	0.2245	0.4510
3.450	0.3919	0.6179
4.677	0.7001	0.8538

Cui, Xiaolong - Chen, Guangming - Li, Changsheng - Han, Xiaohong, Vapor-liquid equilibrium of difluoromethane +1,1,1,2-tetrafluoroethane systems over a temperature range from 258.15 to 343.15K, Fluid Phase Equilibria. 249 (2006) 97-103. doi:10.1016/j.fluid.2006.09.017

T / K = 263.15

P / bar	x_1	y_1
2.934	0.2363	0.4534
3.175	0.3067	0.5335
3.552	0.3869	0.6368
3.964	0.4929	0.7423
4.255	0.5777	0.7978
4.667	0.6912	0.8623
4.927	0.7508	0.9053
5.219	0.8247	0.9313
5.387	0.8741	0.9519
5.526	0.9134	0.9640
5.628	0.9446	0.9749

Weber, L. A. - Silva, A. M., Design of a high-pressure ebulliometer, with vapor-liquid equilibrium results for the systems CHF₂Cl + CF₃CH₃ and CF₃CH₂F + CH₂F₂, International Journal of Thermophysics. 17 (1996) 873-888. doi:10.1007/BF01439194

T / K = 280.00

P / bar	x_1	y_1
4.399	0.1000	0.2240
5.073	0.2000	0.3910
5.745	0.3000	0.5210
6.411	0.4000	0.6250
7.065	0.5000	0.7100
7.704	0.6000	0.7810
8.324	0.7000	0.8420
8.923	0.8000	0.8970
9.503	0.9000	0.9480

Kobayashi, Masanao - Nishiumi, Hideo, Vapor-liquid equilibria for the pure, binary and ternary systems containing HFC32, HFC125 and HFC134a, Fluid Phase Equilibria. 144 (1998) 191-202. doi:10.1016/S0378-3812(97)00257-4

T / K = 293.15

P / bar	x_1	y_1
6.220	0.0700	0.1270

HA-HA or HD-HD systems (BAC = 4)

6.670	0.1300	0.2340
7.470	0.2220	0.3590
8.330	0.3220	0.4790
9.240	0.4310	0.5890
10.76	0.5940	0.7340
12.01	0.7290	0.8330
13.07	0.8330	0.9040
13.30	0.8640	0.9210
13.54	0.8780	0.9310

Chung, Eui-Yeop - Kim, Min Soo, Vapor-Liquid Equilibria for the Difluoromethane (HFC-32) + 1,1,1,2-Tetrafluoroethane (HFC-134a) System, Journal of Chemical & Engineering Data. 42 (1997) 1126-1128. doi:10.1021/je970071m

T / K = 293.15

P / bar	x ₁	y ₁
7.696	0.2376	0.4034
10.62	0.5757	0.7217
12.35	0.7599	0.8568

Shimawaki, S. - Fijii, K. - Higashi, Y., Precise Measurements of the Vapor-Liquid Equilibria (VLE) of HFC-32/134a Mixtures Using a New Apparatus, Int. J. Thermophys. 23 (2002) 801-808. doi:10.1023/A:1015407205188

T / K = 293.15

P / bar	x ₁	y ₁
6.848	0.1350	0.2564
8.052	0.2751	0.4587
8.449	0.3181	0.5024
9.270	0.4138	0.5992
10.22	0.5179	0.7031
11.04	0.6095	0.7645
11.42	0.6507	0.8034
13.75	0.8948	0.9473
13.97	0.9211	0.9608

Weber, L. A. - Silva, A. M., Design of a high-pressure ebulliometer, with vapor-liquid equilibrium results for the systems CHF₂Cl + CF₃CH₃ and CF₃CH₂F + CH₂F₂, International Journal of Thermophysics. 17 (1996) 873-888. doi:10.1007/BF01439194

T / K = 300.00

P / bar	x ₁	y ₁
8.005	0.1000	0.1930
9.022	0.2000	0.3510
10.07	0.3000	0.4820
11.15	0.4000	0.5920
12.26	0.5000	0.6840
13.38	0.6000	0.7630
14.49	0.7000	0.8320
15.60	0.8000	0.8920

16.68	0.9000	0.9460
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Kato, Ryo - Nishiumi, Hideo, Vapor-liquid equilibria and critical loci of binary and ternary systems composed of CH₂F₂, C₂H₅F and C₂H₂F₄, Fluid Phase Equilibria. 249 (2006) 140-146. doi:10.1016/j.fluid.2006.07.017

T / K = 323.15

P / bar	x ₁	y ₁
13.76	0.0610	0.1160
15.91	0.1790	0.3230
17.88	0.3140	0.4680
18.84	0.3680	0.5280
20.43	0.4630	0.6130
21.61	0.5240	0.6700
22.38	0.5640	0.7070
24.94	0.6920	0.8030

Kobayashi, Masanao - Nishiumi, Hideo, Vapor-liquid equilibria for the pure, binary and ternary systems containing HFC32, HFC125 and HFC134a, Fluid Phase Equilibria. 144 (1998) 191-202. doi:10.1016/S0378-3812(97)00257-4

T / K = 363.45

P / bar	x ₁	y ₁
38.45	0.2020	0.2470
40.00	0.2570	0.2950
43.65	0.3570	0.4200
46.56	0.4330	0.4980
48.10	0.4780	0.4810

Critical point

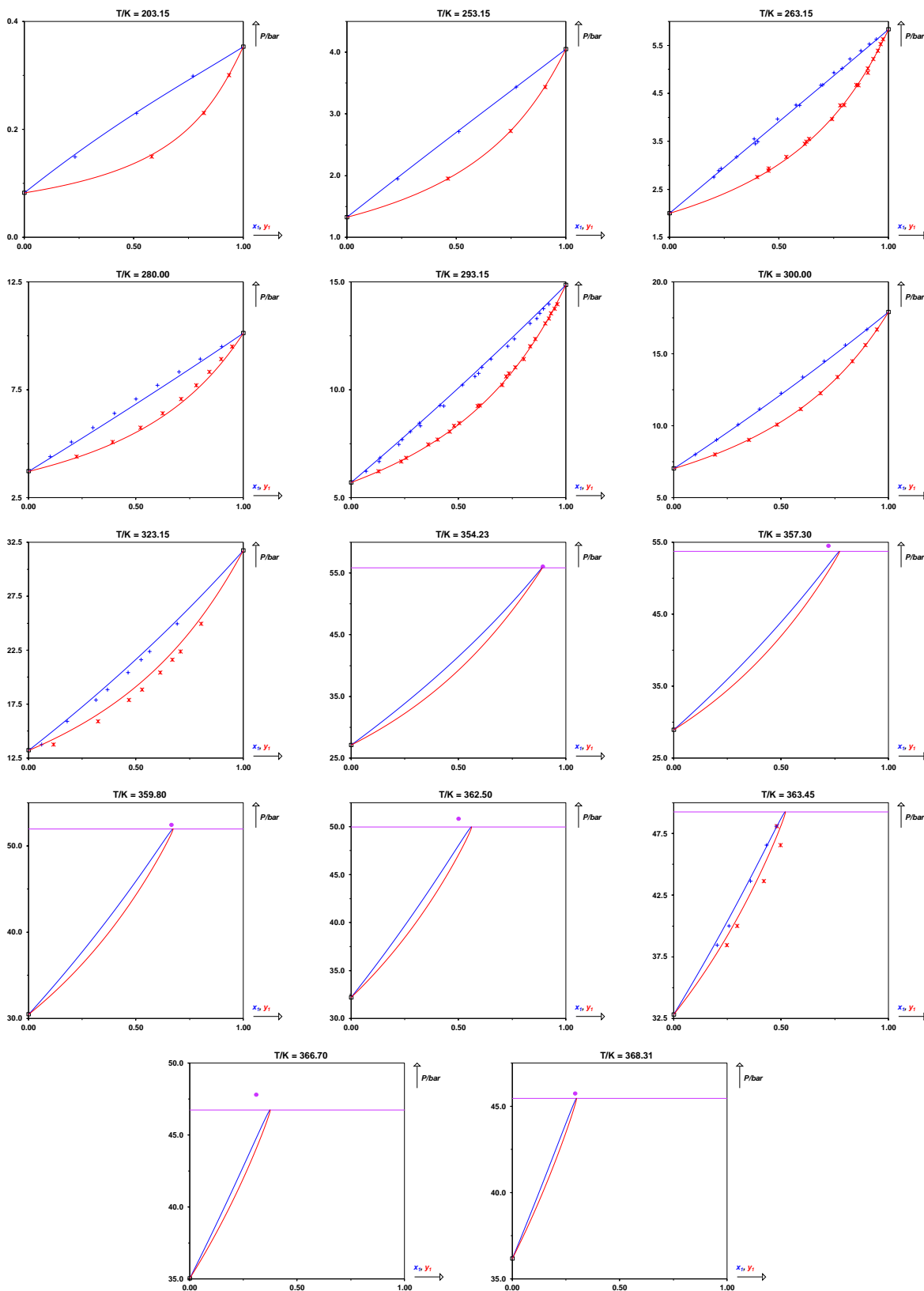
Kato, Ryo - Nishiumi, Hideo, Vapor-liquid equilibria and critical loci of binary and ternary systems composed of CH₂F₂, C₂H₅F and C₂H₂F₄, Fluid Phase Equilibria. 249 (2006) 140-146. doi:10.1016/j.fluid.2006.07.017

T / K	P / bar	x ₁
354.23	56.03	0.8930
359.80	52.40	0.6660
368.31	45.73	0.2930

Kordikowski, Andreas - Robertson, Duncan G. - Poliakoff, Martyn - DiNoia, Todd D. - McHugh, Mark - Aguiar-Ricardo, Ana, Acoustic Determination of the Critical Surfaces in the Ternary Systems CO₂ + CH₂F₂ + CF₃CH₂F and CO + C₂H₄ + CH₃CH₂ and in Their Binary Subsystems, The Journal of Physical Chemistry B. 101 (1997) 5853-5862. doi:10.1021/jp963061l

T / K	P / bar	x ₁
357.30	54.50	0.7200
362.50	50.80	0.5000
366.70	47.80	0.3100

HA-HA or HD-HD systems (BAC = 4)



TRIFLUOROMETHANE (1) + CHLORODIFLUOROMETHANE (2)

CAS	75-46-7	75-45-6
InChiKey	XPDWGBQVDMORPB-UHFFFAOYSA-N	VOPWNXZWBYDODV-UHFFFAOYSA-N
T_c / K	299.01	369.30
P_c / bar	48.16	49.71
ω	0.264	0.219

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

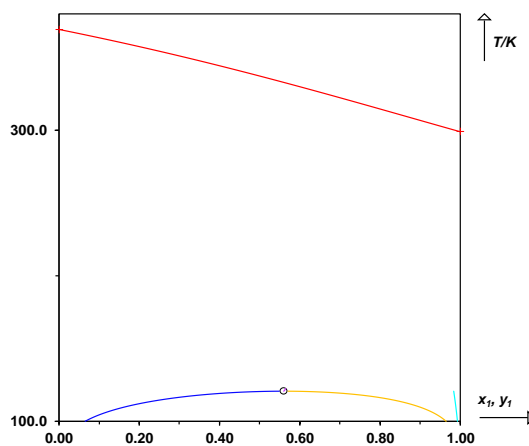
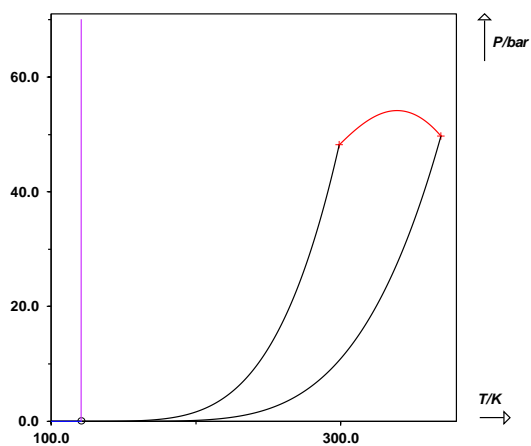
$A/\text{MPa} = 18.03$

$B/\text{MPa} = 47.11$

Deviations

MAPE on $x = 1.6\%$

MAPE on $y = 1.6\%$



Isothermal phase equilibrium data

Feng Yaosheng - Li, C. - Shou, Z., Vapor-Liquid Equilibrium for Trifluoromethane and Chlorodifluoromethane, Huaxue Gongcheng. 12 (1984) 41-47.

T / K = 248.15

P / bar	x ₁	y ₁
2.594	0.0475	0.2520
3.506	0.1250	0.4810
4.712	0.2310	0.6510
5.553	0.3250	0.7340
6.363	0.4080	0.7920
7.143	0.4890	0.8330
7.620	0.5390	0.8540
8.795	0.6610	0.8960
10.11	0.8150	0.9450
10.66	0.8700	0.9610

Feng Yaosheng - Li, C. - Shou, Z., Vapor-Liquid Equilibrium for Trifluoromethane and Chlorodifluoromethane, Huaxue Gongcheng. 12 (1984) 41-47.

T / K = 258.15

P / bar	x ₁	y ₁
3.942	0.0630	0.2800
4.468	0.0990	0.3840
6.880	0.2650	0.6560
8.299	0.3680	0.7460
9.322	0.4580	0.7980
10.63	0.5470	0.8430
11.86	0.6590	0.8900
13.13	0.7590	0.9240
14.85	0.8770	0.9610
15.35	0.9130	0.9720

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 303.15

P / bar	x ₁	y ₁
15.25	0.0903	0.2463
20.20	0.2279	0.4668
25.10	0.3668	0.6042
29.90	0.4962	0.7002
35.15	0.6394	0.7811
40.00	0.7547	0.8445
45.00	0.8608	0.9036
48.05	0.9215	0.9361

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 323.15

P / bar	x ₁	y ₁
24.30	0.0984	0.2217
30.20	0.2181	0.3955
35.60	0.3273	0.5050
39.95	0.4122	0.5768
45.75	0.5240	0.6442
49.90	0.6039	0.6822
51.70	0.6414	0.6933
52.55	0.6601	0.6911

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 343.15

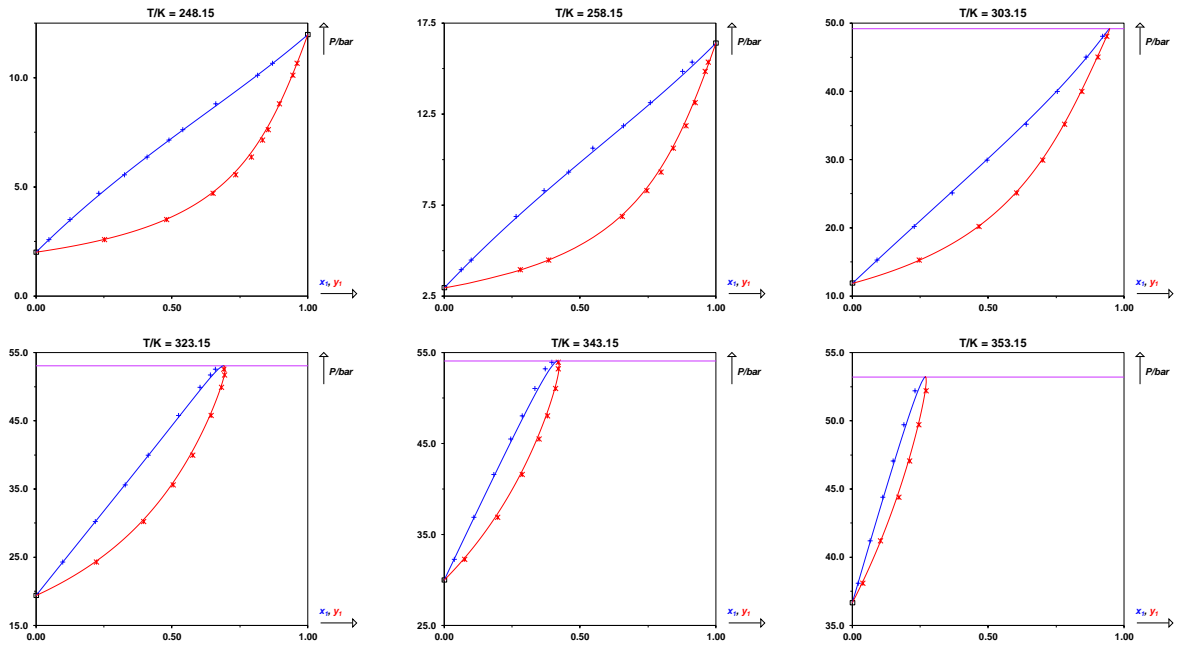
P / bar	x ₁	y ₁
32.25	0.0368	0.0752
36.90	0.1089	0.1961
41.60	0.1819	0.2873
45.50	0.2448	0.3488
48.05	0.2864	0.3803
51.05	0.3337	0.4098
53.20	0.3720	0.4196
53.95	0.3960	0.4191

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 353.15

P / bar	x ₁	y ₁
38.10	0.0218	0.0388
41.20	0.0660	0.1036
44.40	0.1125	0.1715
47.05	0.1496	0.2106
49.70	0.1898	0.2453
52.20	0.2309	0.2711

HA-HA or HD-HD systems (BAC = 4)



1,2-EPOXYBUTANE (1) + DIMETHYL CARBONATE (2)

CAS	106-88-7	616-38-6
InChiKey	RBACIKXCRWGCBB-UHFFFAOYSA-N	IEJIGPNLZYLLBP-UHFFFAOYSA-N
T_c / K	526.00	548.00
P_c / bar	43.90	45.00
ω	0.235	0.385

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 11.96

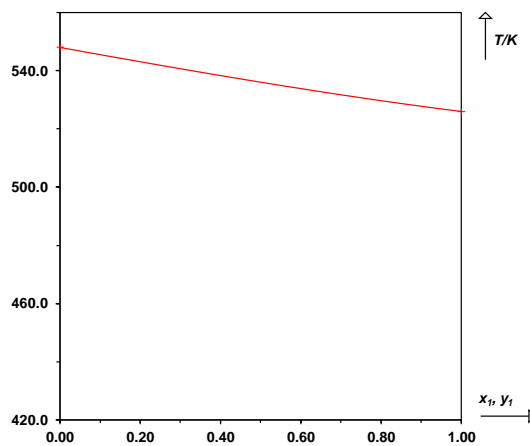
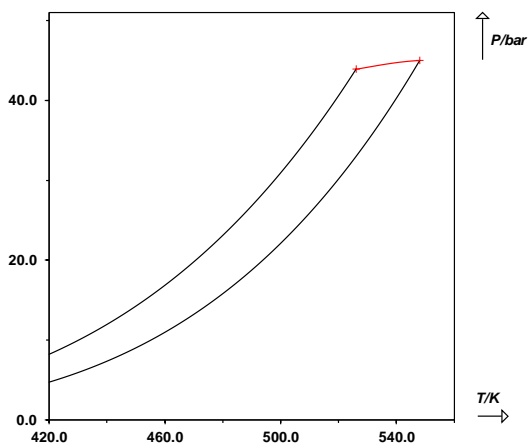
B/MPa = 18.60

Deviations

MAPE on x = 17 %

MAPE on y = 16 %

MAPE on h^M = 20 %



Isothermal phase equilibrium data			0.2160	0.8470	0.9320
-----			0.2205	0.8820	0.9450
-----			0.2240	0.9120	0.9580
-----			0.2300	0.9550	0.9810
Francesconi, Romolo - Comelli, Fabio, Vapor-Liquid Equilibria, Excess Molar Enthalpies, and Excess Molar Volumes of Dimethyl Carbonate + 1,2-Epoxybutane at 288.15, 298.15, or 313.15 K, Journal of Chemical & Engineering Data. 41 (1996) 736-740. doi:10.1021/je950298m			Francesconi, Romolo - Comelli, Fabio, Vapor-Liquid Equilibria, Excess Molar Enthalpies, and Excess Molar Volumes of Dimethyl Carbonate + 1,2-Epoxybutane at 288.15, 298.15, or 313.15 K, Journal of Chemical & Engineering Data. 41 (1996) 736-740. doi:10.1021/je950298m		
T / K =	288.15		T / K =	313.15	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.0480	0.0200	0.0490	0.1660	0.0280	0.1110
0.0510	0.0440	0.0990	0.1790	0.0620	0.1980
0.0565	0.0850	0.2020	0.2020	0.1260	0.3350
0.0605	0.1200	0.2690	0.2170	0.1730	0.4100
0.0665	0.1710	0.3680	0.2260	0.1960	0.4460
0.0720	0.2100	0.4750	0.2510	0.2760	0.5460
0.0770	0.2500	0.5620	0.2695	0.3370	0.6110
0.0855	0.3320	0.6470	0.2835	0.3870	0.6490
0.0945	0.4200	0.7100	0.2970	0.4340	0.6870
0.0995	0.4670	0.7500	0.3120	0.4870	0.7250
0.1065	0.5320	0.7880	0.3275	0.5430	0.7630
0.1090	0.5750	0.8070	0.3530	0.6370	0.8190
0.1150	0.6330	0.8410	0.3720	0.7120	0.8600
0.1220	0.7050	0.8690	0.3885	0.7770	0.8920
0.1280	0.7700	0.8990	0.4025	0.8300	0.9180
0.1330	0.8260	0.9220	0.4135	0.8820	0.9410
0.1375	0.8700	0.9420	0.4260	0.9350	0.9700
0.1405	0.9110	0.9650			
-----			-----		
Francesconi, Romolo - Comelli, Fabio, Vapor-Liquid Equilibria, Excess Molar Enthalpies, and Excess Molar Volumes of Dimethyl Carbonate + 1,2-Epoxybutane at 288.15, 298.15, or 313.15 K, Journal of Chemical & Engineering Data. 41 (1996) 736-740. doi:10.1021/je950298m			Francesconi, Romolo - Comelli, Fabio, Vapor-Liquid Equilibria, Excess Molar Enthalpies, and Excess Molar Volumes of Dimethyl Carbonate + 1,2-Epoxybutane at 288.15, 298.15, or 313.15 K, Journal of Chemical & Engineering Data. 41 (1996) 736-740. doi:10.1021/je950298m		
T / K =	298.15		Enthalpy of mixing		
P / bar	x ₁	y ₁	-----		
0.0815	0.0350	0.1410	Francesconi, Romolo - Comelli, Fabio, Vapor-Liquid Equilibria, Excess Molar Enthalpies, and Excess Molar Volumes of Dimethyl Carbonate + 1,2-Epoxybutane at 288.15, 298.15, or 313.15 K, Journal of Chemical & Engineering Data. 41 (1996) 736-740. doi:10.1021/je950298m		
0.0915	0.0770	0.2550	T / K =	288.15	
0.0970	0.1120	0.3300	P / bar =	UNKNOWN (1.0132)	
0.1070	0.1590	0.4210	h ^M / J.mol ⁻¹	x ₁	
0.1190	0.2250	0.5160	16.20	0.0388	
0.1345	0.3070	0.6020	40.80	0.0748	
0.1485	0.3920	0.6820	69.50	0.1081	
0.1600	0.4710	0.7370	99.80	0.1390	
0.1755	0.5680	0.7960	154.90	0.1951	
0.1820	0.6160	0.8210	192.70	0.2443	
0.1900	0.6770	0.8540	247.70	0.3265	
0.1990	0.7420	0.8780	277.60	0.3926	
0.2090	0.8060	0.9100			

HA-HA or HD-HD systems (BAC = 4)

295.00	0.4889	197.30	0.2438
283.90	0.5863	246.20	0.3260
260.90	0.6567	274.40	0.3920
212.50	0.7416	294.80	0.4917
175.20	0.7928	283.90	0.5920
122.90	0.8516	266.70	0.6592
92.60	0.8844	220.70	0.7437
58.30	0.9209	181.80	0.7946
28.50	0.9588	130.40	0.8530

106.20	0.8856
68.10	0.9207
33.50	0.9587

Francesconi, Romolo - Comelli, Fabio, Vapor-Liquid Equilibria, Excess Molar Enthalpies, and Excess Molar Volumes of Dimethyl Carbonate + 1,2-Epoxybutane at 288.15, 298.15, or 313.15 K, Journal of Chemical & Engineering Data. 41 (1996) 736-740. doi:10.1021/je950298m

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
18.20	0.0388
43.80	0.0747
73.00	0.1080
101.70	0.1390
152.80	0.1950
192.10	0.2441
242.80	0.3263
266.90	0.3923
285.70	0.4921
277.20	0.5924
260.20	0.6596
219.20	0.7440
182.90	0.7949
124.50	0.8532
94.60	0.8857
57.70	0.9208
28.20	0.9588

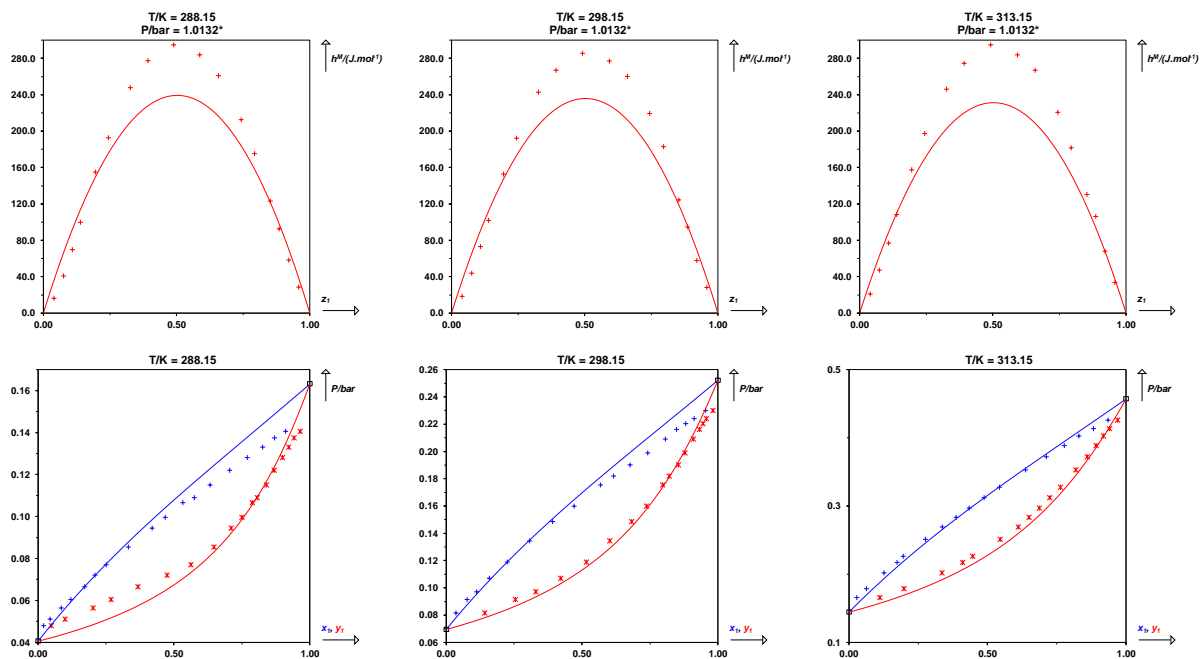
Francesconi, Romolo - Comelli, Fabio, Vapor-Liquid Equilibria, Excess Molar Enthalpies, and Excess Molar Volumes of Dimethyl Carbonate + 1,2-Epoxybutane at 288.15, 298.15, or 313.15 K, Journal of Chemical & Engineering Data. 41 (1996) 736-740. doi:10.1021/je950298m

T / K = 313.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
20.90	0.0387
47.40	0.0746
76.70	0.1079
108.20	0.1388
157.50	0.1947

HA-HA or HD-HD systems (BAC = 4)



TETRAHYDROFURAN (1) + N,N-DIMETHYLFORMAMIDE (2)

CAS	109-99-9	68-12-2
InChiKey	WYURNTSHIVDZCO-UHFFFAOYSA-N	ZMXDDKWLCZADIW-UHFFFAOYSA-N
T_c / K	540.15	649.60
P_c / bar	51.90	44.20
ω	0.225	0.318

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 30.93

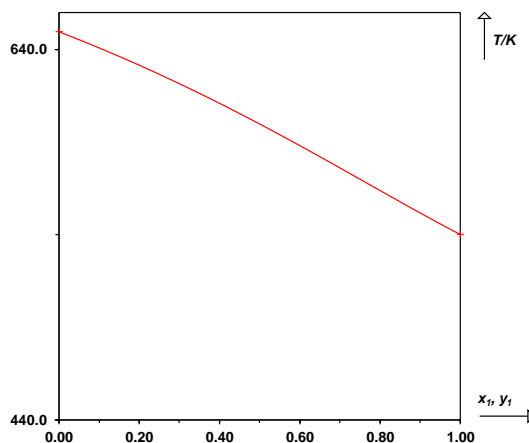
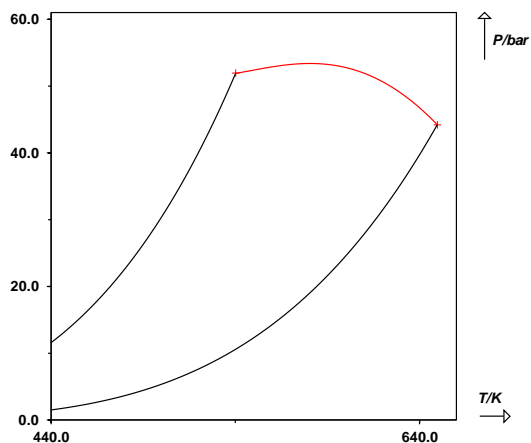
B/MPa = 26.45

Deviations

MAPE on x = 5.0 %

MAPE on y = 6.5 %

MAPE on h^M = 5.2 %



Isothermal phase equilibrium data

Geier, K. - Bittrich, H.-J., Zur Thermodynamik der Flüssig-Dampf-Gleichgewichte der binären Systeme n-Hexan/Benzol, Cyclohexan/Benzol und Tetrahydrofuran mit n-hexan, cyclohexan, benzol und dimethylformamid, Zeitschrift für Physikalische Chemie. 2600 (1979) doi:10.1515/zpch-1979-26094

T / K = 313.15

P / bar	x ₁	y ₁
0.1121	0.1560	0.9020
0.1725	0.2970	0.9440
0.2272	0.4440	0.9630
0.2678	0.5630	0.9740
0.2970	0.6550	0.9800
0.3177	0.7260	0.9850
0.3341	0.7800	0.9870
0.3468	0.8250	0.9890
0.3597	0.8610	0.9920
0.3702	0.8950	0.9930
0.3769	0.9170	0.9940
0.3844	0.9400	0.9960
0.3898	0.9550	0.9970
0.3960	0.9740	0.9980

Geier, K. - Bittrich, H.-J., Zur Thermodynamik der Flüssig-Dampf-Gleichgewichte der binären Systeme n-Hexan/Benzol, Cyclohexan/Benzol und Tetrahydrofuran mit n-hexan, cyclohexan, benzol und dimethylformamid, Zeitschrift für Physikalische Chemie. 2600 (1979) doi:10.1515/zpch-1979-26094

T / K = 333.15

P / bar	x ₁	y ₁
0.1032	0.0450	0.6820
0.1217	0.0580	0.7330
0.1552	0.0870	0.7990
0.1704	0.1000	0.8200
0.2139	0.1400	0.8630
0.2564	0.1800	0.8890
0.3040	0.2300	0.9100
0.3522	0.2840	0.9280
0.4220	0.3750	0.9450
0.4673	0.4380	0.9530
0.5442	0.5500	0.9660
0.7226	0.8250	0.9880
0.7681	0.8950	0.9930

Enthalpy of mixing

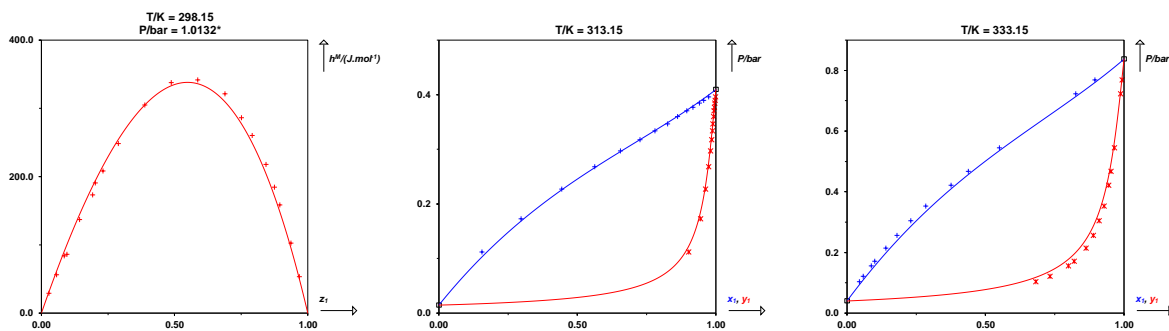
Conti, G. - Gianni, P. - Matteoli, E., Excess enthalpies and excess heat capacities of (N,N-dimethylformamide + tetrahydrofuran + cyclohexane) at the temperature 298.15 K, The Journal of Chemical Thermodynamics. 26 (1994) 1249-1257. doi:10.1006/jcht.1994.1142

T / K = 298.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
29.30	0.0285
56.40	0.0572
84.10	0.0859
86.30	0.0953
137.10	0.1435
173.00	0.1916
190.70	0.2014
208.20	0.2305
248.50	0.2889
304.80	0.3873
337.60	0.4867
341.60	0.5871
321.40	0.6887
286.30	0.7502
260.20	0.7913
217.80	0.8431
184.70	0.8743
158.30	0.8951
102.40	0.9369
53.10	0.9684

HA-HA or HD-HD systems (BAC = 4)



DIETHYL ETHER (1) + ACETONE (2)

CAS	60-29-7	67-64-1
InChiKey	RTZKZFJDLAIYFH-UHFFFAOYSA-N	CSCPPACGZOOOGX-UHFFFAOYSA-N
T_c / K	466.70	508.20
P_c / bar	36.40	47.01
ω	0.281	0.307

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 46.43

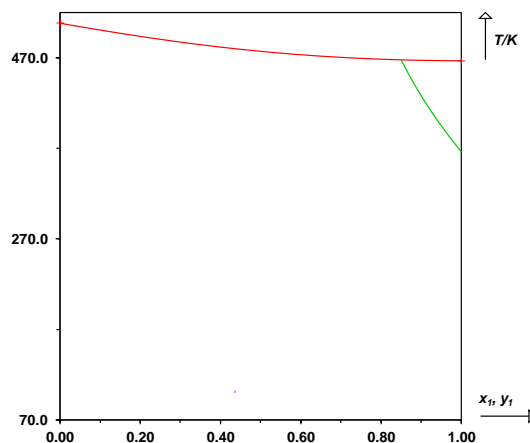
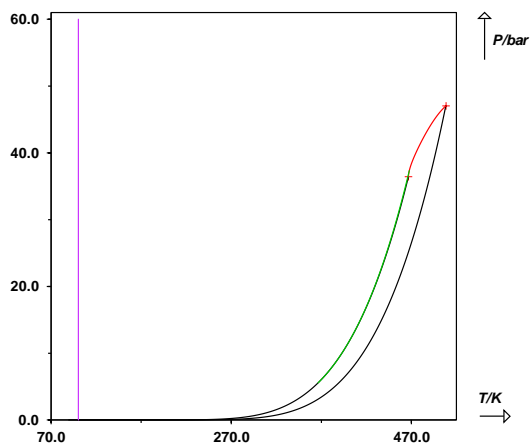
B/MPa = 35.63

Deviations

MAPE on x = 6.4 %

MAPE on y = 3.1 %

MAPE on h^M = 13 %



Isothermal phase equilibrium data

Gerrits, G.C., On Px-Curves of Mixtures of Acetone and Ethyl Ether and of Carbon Tetrachloride and Acetone at 0 °C, Proc. K. Ned. Akad. Wet. Nat. Sci. 7 (1905) 162-173.

T / K =	273.15	
P / bar	x ₁	y ₁
0.1070	0.0240	0.1730
0.1307	0.0830	0.3420
0.1427	0.1240	0.4210
0.1693	0.2320	0.5530
0.1792	0.2950	0.5900
0.2196	0.5610	0.7480
0.2402	0.7960	0.8460

Sameshima, Jitsusaburo, On The System Acetone—Ethyl Ether., Journal of the American Chemical Society. 40 (1918) 1482-1503. doi:10.1021/ja02243a002

T / K =	293.15	
P / bar	x ₁	y ₁
0.2479	0.0041	0.0098
0.2624	0.0210	0.0784
0.2950	0.0642	0.2090
0.2970	0.0683	0.2168
0.3301	0.1117	0.3219
0.3621	0.1584	0.4089
0.4453	0.3338	0.5951
0.4682	0.3879	0.6389
0.5160	0.5430	0.7283
0.5609	0.7510	0.8332
0.5812	0.8729	0.9042
0.5890	0.9480	0.9557

Sameshima, Jitsusaburo, On The System Acetone—Ethyl Ether., Journal of the American Chemical Society. 40 (1918) 1482-1503. doi:10.1021/ja02243a002

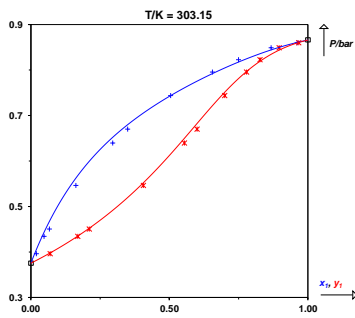
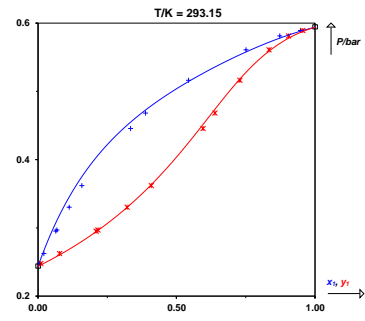
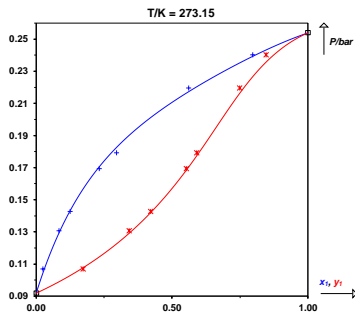
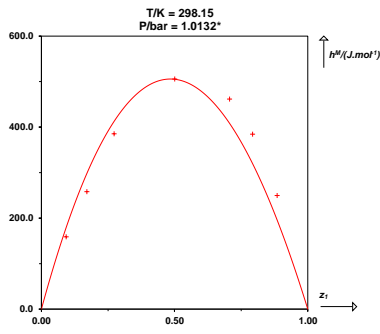
T / K =	303.15	
P / bar	x ₁	y ₁
0.3965	0.0201	0.0698
0.4346	0.0472	0.1696
0.4504	0.0663	0.2101
0.5461	0.1619	0.4066
0.6396	0.2953	0.5545
0.6702	0.3493	0.5997
0.7437	0.5042	0.6996
0.7959	0.6546	0.7782
0.8225	0.7491	0.8270
0.8493	0.8673	0.8960
0.8603	0.9613	0.9663

Enthalpy of mixing

Hirobe, H., Thermochemical studies, J. Fac. Sci. Univ. Tokyo Sect. 1. 1 (1926) 155-222.

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
158.68	0.0923	
257.91	0.1705	
385.19	0.2731	
505.35	0.5002	
461.38	0.7057	
384.77	0.7932	
249.53	0.8845	

HA-HA or HD-HD systems (BAC = 4)



CARBON DISULFIDE (1) + ACETONE (2)

CAS	75-15-0	67-64-1
InChiKey	QGJOPFRUJISHPQ-UHFFFAOYSA-N	CSCPPACGZOO CGX-UHFFFAOYSA-N
T_c / K	552.00	508.20
P_c / bar	79.00	47.01
ω	0.111	0.307

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 134.3$

$B/\text{MPa} = -118.9$

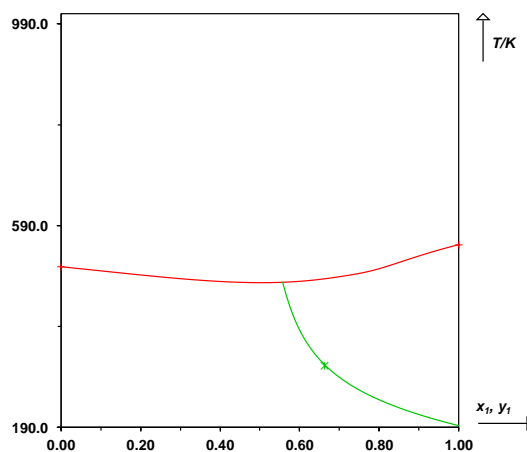
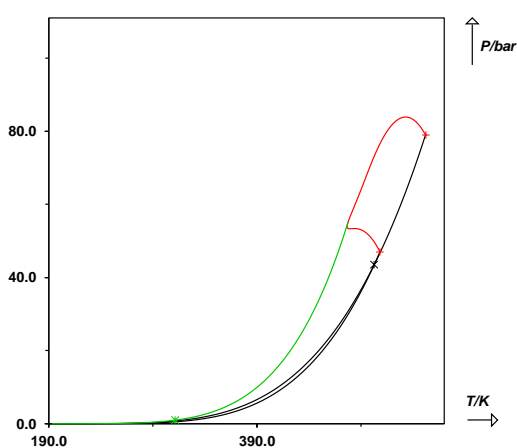
Deviations

MAPE on $x = 6.5\%$

MAPE on $y = 1.4\%$

MAPE on $x_{az} = 0.8\%$

MAPE on $P_{az} = 0.2\%$



Isothermal phase equilibrium data

Litvinov, N.D., Isothermal equilibrium of vapor and liquid in systems of three fully miscible liquids, Zh. Fiz. Khim. 26 (1952) 1405-1412.

T / K = 298.15

P / bar	x ₁	y ₁
0.4206	0.1000	0.3520
0.5032	0.2000	0.5050
0.5533	0.3000	0.5830
0.5792	0.4000	0.6250
0.5905	0.5000	0.6480
0.5942	0.6000	0.6620
0.5946	0.7000	0.6740
0.5901	0.8000	0.6980
0.5649	0.9000	0.7650

Zawidzki, Jan von, Über die Dampfdrücke binärer Flüssigkeitsgemische, Zeitschrift für Physikalische Chemie. 35U (1900) doi:10.1515/zpch-1900-3514

T / K = 308.32

P / bar	x ₁	y ₁
0.5889	0.0624	0.2506
0.5966	0.0670	0.2674
0.6024	0.0711	0.2724
0.6735	0.1212	0.3794
0.6863	0.1330	0.4012
0.7383	0.1857	0.4666
0.7499	0.1991	0.4834
0.7563	0.2085	0.5005
0.7979	0.2761	0.5403
0.8038	0.2869	0.5452
0.8295	0.3502	0.5759
0.8311	0.3551	0.5795
0.8454	0.4058	0.5986
0.8467	0.4141	0.6015
0.8541	0.4474	0.6094
0.8557	0.4530	0.6141
0.8613	0.4933	0.6242
0.8615	0.4974	0.6254
0.8693	0.5702	0.6433
0.8699	0.5730	0.6441
0.8718	0.6124	0.6529
0.8733	0.6713	0.6682
0.8601	0.8280	0.7207
0.8187	0.9191	0.7989
0.8137	0.9245	0.8029
0.8017	0.9350	0.8181
0.7939	0.9407	0.8261

0.7761	0.9549	0.8523
0.7655	0.9620	0.8723
0.7519	0.9692	0.8902

Isobaric phase equilibrium data

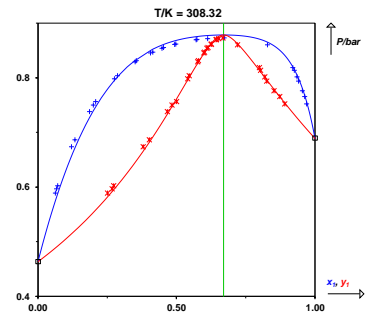
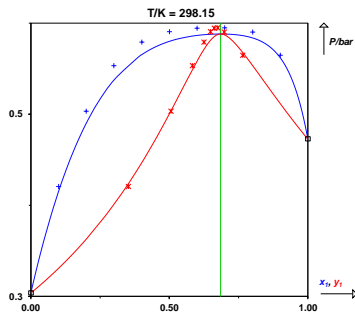
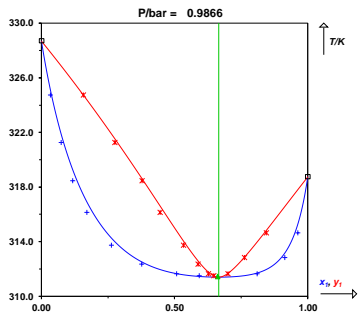
Loiseleur, Henri - Merlin, Jean-Claude - Paris, René A., Diagrammes d'ébullition-rosée (sous 740 mm) des systèmes acétone-sulfure de carbone, acétone-tétrachloréthylène et cyclopentanone-sulfure de carbone, Journal de Chimie Physique. 61 (1964) 1231-1233. doi:10.1051/jcp/1964611231

P / bar = 0.9866

T / K	x ₁	y ₁
324.75	0.0340	0.1570
321.25	0.0740	0.2760
318.45	0.1170	0.3780
316.15	0.1700	0.4460
313.75	0.2630	0.5340
312.35	0.3770	0.5880
311.65	0.5070	0.6270
311.50	0.5930	0.6470
311.45	0.6620	0.6620
311.65	0.8100	0.7010
312.85	0.9140	0.7630
314.65	0.9630	0.8440

AZEO

HA-HA or HD-HD systems (BAC = 4)



THIOPHENE (1) + SULFOLANE (2)

CAS	110-02-1	126-33-0
InChiKey	YTPLMLYBLZKORZ-UHFFFAOYSA-N	HXJUTPCZVOIRIF-UHFFFAOYSA-N
T_c / K	579.35	853.00
P_c / bar	56.90	50.30
ω	0.197	0.382

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 20.20$

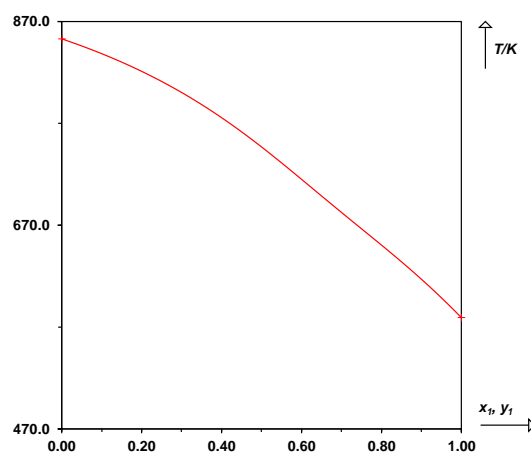
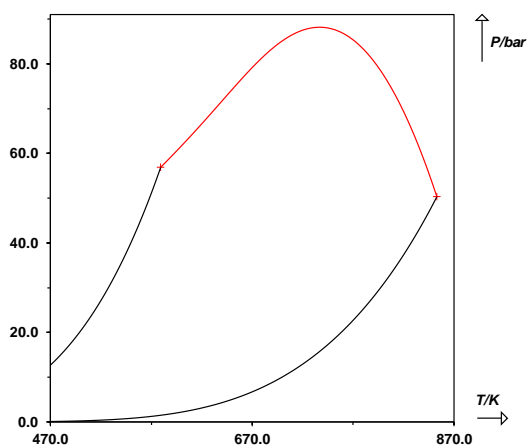
$B/\text{MPa} = -20.77$

Deviations

MAPE on $x = 2.0\%$

MAPE on $y = 17\%$

MAPE on $h^M = 18\%$



-----			-277.19	0.3697
Isothermal phase equilibrium data			-320.59	0.4482
-----			-347.35	0.5244
Ahlers, S., Systematische Messung thermodynamischer Daten für das System Thiophen - Sulfolan zur Erweiterung der Gruppenbeitragsmethode Modified UNIFAC (Dortmund) (2009)			-359.45	0.5739
T / K = 353.15			-362.97	0.6464
P / bar	x ₁	y ₁	-345.56	0.7168
0.0087	0.0050	0.9240	-292.75	0.7852
0.0157	0.0100	0.9610	-231.14	0.8517
0.0302	0.0200	0.9800	-148.88	0.9164
0.0548	0.0380	0.9890	-78.40	0.9586
0.0800	0.0570	0.9930		
0.1075	0.0770	0.9950		
0.1402	0.1030	0.9960		
0.1824	0.1360	0.9970		

Ahlers, S., Systematische Messung thermodynamischer Daten für das System Thiophen - Sulfolan zur Erweiterung der Gruppenbeitragsmethode Modified UNIFAC (Dortmund) (2009)

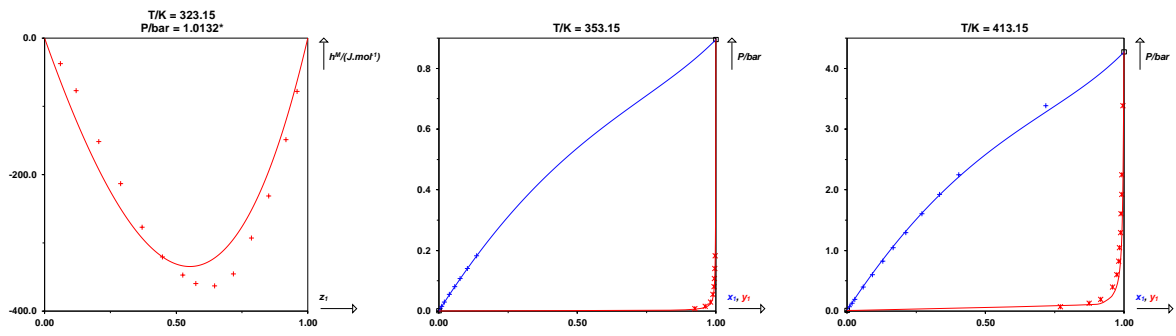
T / K = 413.15		
P / bar	x ₁	y ₁
0.0712	0.0090	0.7700
0.1300	0.0180	0.8740
0.1941	0.0280	0.9160
0.3944	0.0580	0.9580
0.5995	0.0920	0.9730
0.8256	0.1290	0.9800
1.043	0.1660	0.9840
1.296	0.2120	0.9870
1.604	0.2700	0.9890
1.924	0.3340	0.9910
2.246	0.4030	0.9920
3.386	0.7180	0.9960

Enthalpy of mixing

Ahlers, S., Systematische Messung thermodynamischer Daten für das System Thiophen - Sulfolan zur Erweiterung der Gruppenbeitragsmethode Modified UNIFAC (Dortmund) (2009)

T / K = 323.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
-37.38	0.0603
-77.26	0.1192
-151.89	0.2054
-213.24	0.2888

HA-HA or HD-HD systems (BAC = 4)



CHLORODIFLUOROMETHANE (1) + 1,1,1,2-TETRAFLUOROETHANE (2)

CAS	75-45-6	811-97-2
InChiKey	VOPWNXZWBVDODV-UHFFFAOYSA-N	LVGUZGTVOIAKKC-UHFFFAOYSA-N
T_c / K	369.30	374.18
P_c / bar	49.71	40.56
ω	0.219	0.327

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

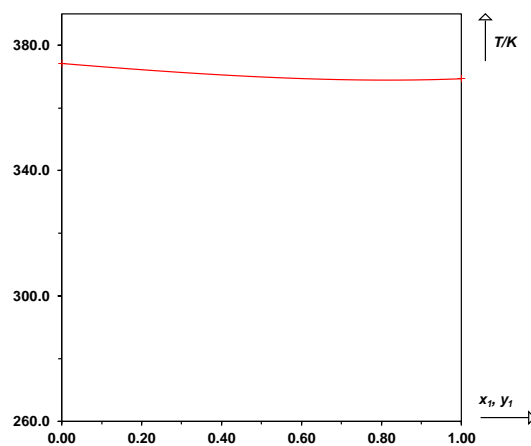
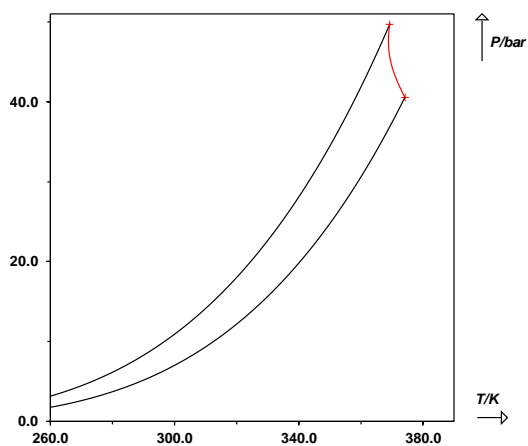
A/MPa = 13.40

B/MPa = 8.249

Deviations

MAPE on x = 2.0 %

MAPE on y = 2.6 %



-----			40.20	0.0760	0.0790
Isothermal phase equilibrium data			40.67	0.1040	0.1080
-----			41.00	0.1240	0.1300
Arita, Koji - Tomizawa, Takeshi - Nagakawa, Yuko -			41.42	0.1480	0.1520
Yoshida, Yuji, Vapour—liquid equilibrium of the non-			41.75	0.1710	0.1760
azeotropic refrigerant mixture formed by			42.18	0.2050	0.2090
chlorofluoromethane and 1,1,1,2-tetrafluoroethane,					
Fluid Phase Equilibria. 63 (1991) 151-156.					
doi:10.1016/0378-3812(91)80027-S					
T / K = 298.16					
P / bar	x_1	y_1			
8.011	0.2953	0.3895			
8.973	0.5519	0.6436			
9.636	0.7460	0.8041			
9.872	0.8229	0.8631			

Arita, Koji - Tomizawa, Takeshi - Nagakawa, Yuko -
 Yoshida, Yuji, Vapour—liquid equilibrium of the non-
 azeotropic refrigerant mixture formed by
 chlorofluoromethane and 1,1,1,2-tetrafluoroethane,
 Fluid Phase Equilibria. 63 (1991) 151-156.
 doi:10.1016/0378-3812(91)80027-S

T / K = 323.16		
P / bar	x_1	y_1
15.33	0.2995	0.3712
16.06	0.4031	0.4832
17.03	0.5657	0.6384
18.07	0.7430	0.7913
18.52	0.8247	0.8630

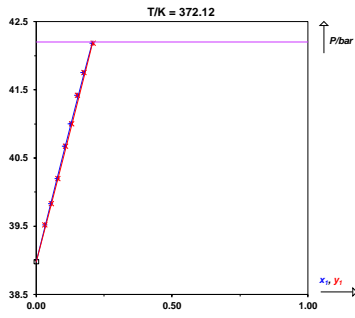
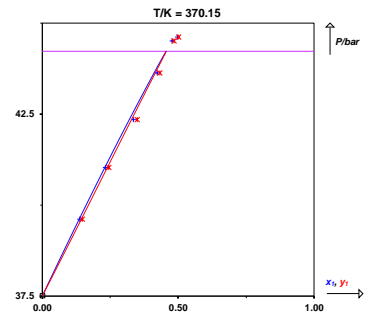
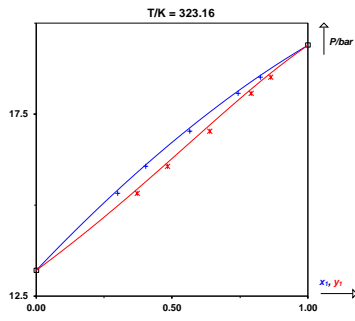
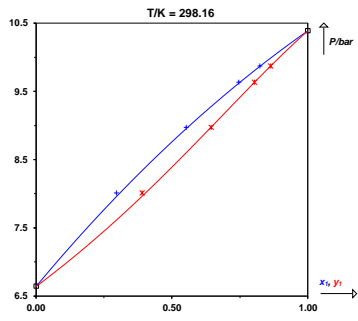
Nishiumi, Hideo - Komatsu, Masahiro - Yokoyama,
 Taichirou - Kohmatsu, Satoshi, Two- and three-phase
 equilibria and critical locus for the system of HCFC22-
 HFC134a, Fluid Phase Equilibria. 83 (1993) 109-117.
 doi:10.1016/0378-3812(93)87013-Q

T / K = 370.15		
P / bar	x_1	y_1
39.61	0.1370	0.1470
41.03	0.2320	0.2440
42.35	0.3350	0.3490
43.63	0.4220	0.4330
44.51	0.4780	0.4840
44.62	0.4970	0.5010

Nishiumi, Hideo - Komatsu, Masahiro - Yokoyama,
 Taichirou - Kohmatsu, Satoshi, Two- and three-phase
 equilibria and critical locus for the system of HCFC22-
 HFC134a, Fluid Phase Equilibria. 83 (1993) 109-117.
 doi:10.1016/0378-3812(93)87013-Q

T / K = 372.12		
P / bar	x_1	y_1
39.52	0.0310	0.0320
39.83	0.0530	0.0550

HA-HA or HD-HD systems (BAC = 4)



ETHYL ACETATE (1) + 1,4-DIOXANE (2)

CAS	141-78-6	123-91-1
InChiKey	XEKOWRVHYACXOJ-UHFFFAOYSA-N	RYHBNJHYFVUHQT-UHFFFAOYSA-N
T_c / K	523.30	587.00
P_c / bar	38.80	52.08
ω	0.366	0.279

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

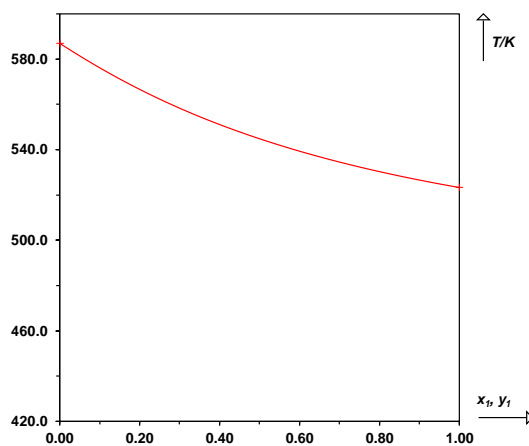
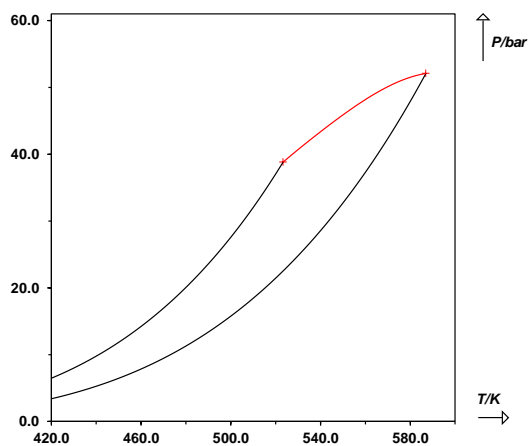
$A/\text{MPa} = 1.676$

$B/\text{MPa} = -7.714$

Deviations

MAPE on $x = 5.2\%$

MAPE on $y = 6.2\%$



Isothermal phase equilibrium data

Steinbrecher, M. - Bittrich, H.-J., Das isotherme Flüssigkeits-Dampf-Gleichgewicht der binären Systeme zwischen den Komponenten Tetrachlormethan, Äthylacetat und Dioxan, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23228

T / K = 293.15

P / bar	y ₁
0.0385	0.0600
0.0407	0.1230
0.0405	0.1370
0.0428	0.2030
0.0468	0.2990
0.0485	0.3470
0.0547	0.4720
0.0552	0.5180
0.0580	0.5380
0.0641	0.6230
0.0659	0.6540
0.0716	0.7130
0.0792	0.8090
0.0849	0.8800
0.0953	0.9740

Steinbrecher, M. - Bittrich, H.-J., Das isotherme Flüssigkeits-Dampf-Gleichgewicht der binären Systeme zwischen den Komponenten Tetrachlormethan, Äthylacetat und Dioxan, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23228

T / K = 293.15

P / bar	x ₁
0.0425	0.0600
0.0479	0.1230
0.0485	0.1370
0.0528	0.2030
0.0593	0.2990
0.0623	0.3470
0.0701	0.4720
0.0723	0.5180
0.0744	0.5380
0.0791	0.6230
0.0801	0.6540
0.0829	0.7130
0.0880	0.8090
0.0915	0.8800
0.0968	0.9740

Engelmann, K. - Bittrich, H.J., Estimation of isothermal mixing functions from isobaric liquid-vapor equilibriums,

Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 11 (1969) 213-218.

T / K = 335.65

P / bar	x ₁	y ₁
0.2666	0.0039	0.0109
0.3333	0.1605	0.3271
0.4000	0.3484	0.5538
0.4666	0.5466	0.7333
0.6000	0.9658	0.9837

Engelmann, K. - Bittrich, H.J., Estimation of isothermal mixing functions from isobaric liquid-vapor equilibriums, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 11 (1969) 213-218.

T / K = 340.65

P / bar	x ₁	y ₁
0.3333	0.0233	0.0578
0.4000	0.1566	0.3159
0.4666	0.3201	0.5227
0.6000	0.6624	0.8077
0.6666	0.8226	0.9065

Engelmann, K. - Bittrich, H.J., Estimation of isothermal mixing functions from isobaric liquid-vapor equilibriums, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 11 (1969) 213-218.

T / K = 345.65

P / bar	x ₁	y ₁
0.4000	0.0200	0.0514
0.4666	0.1397	0.2822
0.6000	0.4117	0.6061
0.6666	0.5443	0.7214
0.7999	0.8391	0.9142
0.8666	0.9890	0.9933

Engelmann, K. - Bittrich, H.J., Estimation of isothermal mixing functions from isobaric liquid-vapor equilibriums, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 11 (1969) 213-218.

T / K = 350.65

P / bar	x ₁	y ₁
0.4666	0.0042	0.0108
0.6000	0.2107	0.3807
0.6666	0.3212	0.5136
0.7999	0.5641	0.7357
0.8666	0.6737	0.8110
0.9333	0.8096	0.8969
1.013	0.9698	0.9833

Isobaric phase equilibrium data

HA-HA or HD-HD systems (BAC = 4)

Engelmann, K. - Bittrich, H.J., Isobaric liquid-vapor equilibriums of the system diethylamine-ethyl acetate, diethylamine-1,4-dioxane and ethyl acetate-1,4-dioxane at reduced pressures, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 289-291.

P / bar = 0.2666

T / K	x ₁	y ₁
334.70	0.0230	0.0670
333.55	0.0520	0.1320
332.45	0.0850	0.1990
331.20	0.1220	0.2650
329.65	0.1750	0.3500
328.20	0.2300	0.4240
326.15	0.3160	0.5220
324.50	0.3970	0.6000
322.70	0.4850	0.6810
320.90	0.5830	0.7600
319.20	0.6890	0.8300
317.60	0.7950	0.8910
316.60	0.8640	0.9310
315.70	0.9280	0.9660

Engelmann, K. - Bittrich, H.J., Isobaric liquid-vapor equilibriums of the system diethylamine-ethyl acetate, diethylamine-1,4-dioxane and ethyl acetate-1,4-dioxane at reduced pressures, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 289-291.

P / bar = 0.5333

T / K	x ₁	y ₁
353.70	0.0180	0.0550
352.25	0.0550	0.1360
351.20	0.0850	0.1930
349.75	0.1290	0.2690
348.45	0.1700	0.3340
347.05	0.2160	0.4000
345.20	0.2840	0.4850
343.25	0.3640	0.5710
341.50	0.4460	0.6470
340.15	0.5100	0.7000
338.20	0.6110	0.7760
336.50	0.7060	0.8400
335.15	0.7920	0.8910
334.00	0.8650	0.9320
333.05	0.9310	0.9660

Engelmann, K. - Bittrich, H.J., Isobaric liquid-vapor equilibriums of the system diethylamine-ethyl acetate, diethylamine-1,4-dioxane and ethyl acetate-1,4-dioxane at reduced pressures, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 289-291.

P / bar = 0.7999

T / K	x ₁	y ₁
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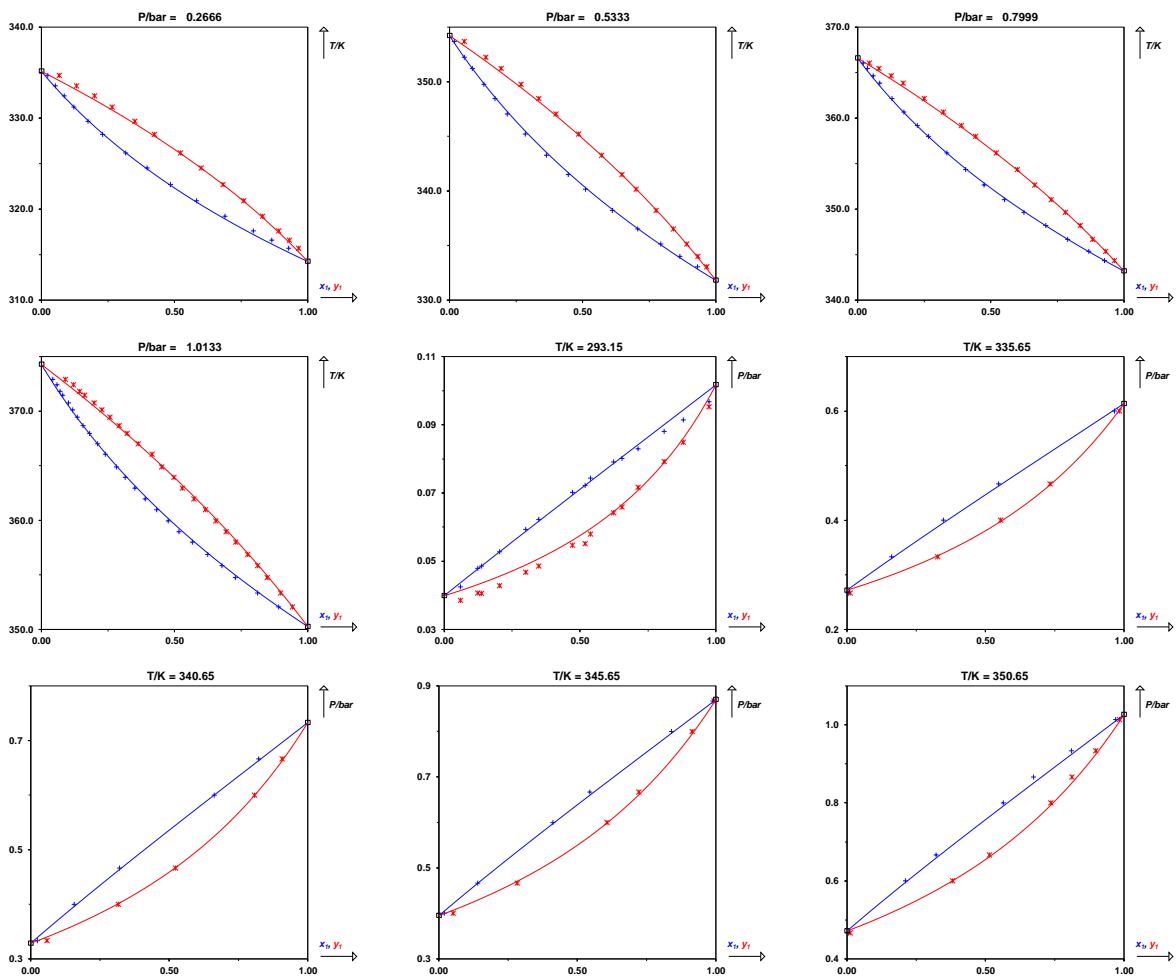
366.05	0.0200	0.0440
365.45	0.0370	0.0800
364.65	0.0580	0.1260
363.85	0.0820	0.1700
362.15	0.1280	0.2500
360.65	0.1740	0.3210
359.20	0.2230	0.3890
358.00	0.2650	0.4430
356.15	0.3340	0.5200
354.35	0.4050	0.5990
352.65	0.4740	0.6640
351.05	0.5500	0.7260
349.65	0.6240	0.7800
348.20	0.7060	0.8360
346.65	0.7880	0.8820
345.35	0.8680	0.9310
344.35	0.9260	0.9640

Engelmann, K. - Bittrich, H.J., Isobaric liquid-vapor equilibriums of the systems diethylamine/ethyl acetate, diethylamine/1,4-dioxane, and ethyl acetate/1,4-dioxane at 760 mm, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 148-153.

P / bar = 1.013

T / K	x ₁	y ₁
372.90	0.0420	0.0900
372.40	0.0580	0.1200
371.80	0.0690	0.1430
371.45	0.0790	0.1620
370.75	0.1020	0.1980
370.10	0.1170	0.2260
369.45	0.1340	0.2570
368.65	0.1560	0.2910
367.95	0.1810	0.3220
367.00	0.2110	0.3630
366.05	0.2390	0.4150
364.90	0.2810	0.4510
363.95	0.3150	0.4980
362.95	0.3500	0.5290
361.95	0.3900	0.5720
360.95	0.4320	0.6150
359.95	0.4760	0.6550
358.95	0.5160	0.6930
358.00	0.5670	0.7290
356.85	0.6240	0.7740
355.85	0.6780	0.8110
354.75	0.7280	0.8470
353.35	0.8120	0.8970
352.05	0.8900	0.9420

HA-HA or HD-HD systems (BAC = 4)



DIMETHYL CARBONATE (1) + DIETHYL CARBONATE (2)

CAS	616-38-6	105-58-8
InChiKey	IEJIGPNLZYLLBP-UHFFFAOYSA-N	OIFBSDVPJOWBCH-UHFFFAOYSA-N
T_c / K	548.00	576.00
P_c / bar	45.00	33.90
ω	0.385	0.486

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 23.94$

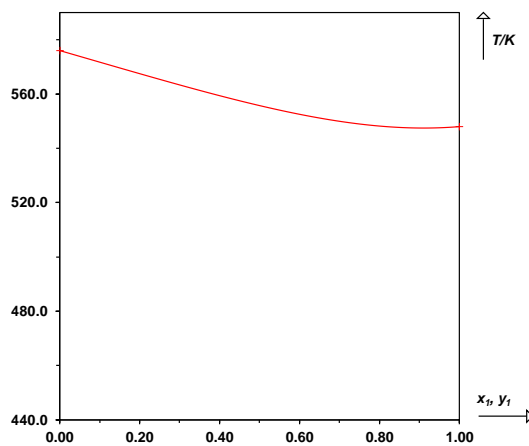
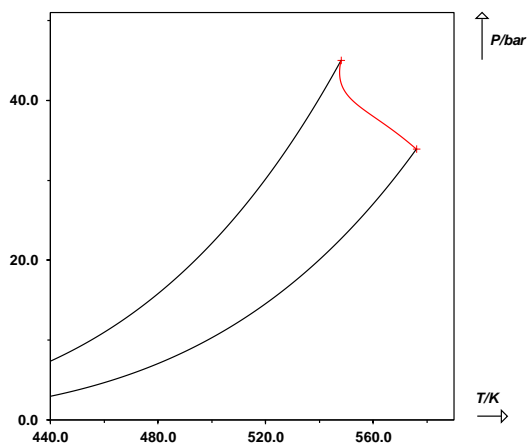
$B/\text{MPa} = 6.761$

Deviations

MAPE on $x = 11\%$

MAPE on $y = 11\%$

MAPE on $h^M = 8.4\%$



Isothermal phase equilibrium data

Comelli, Fabio - Francesconi, Romolo - Ottani, Stefano, Isothermal Vapor–Liquid Equilibria of Dimethyl Carbonate + Diethyl Carbonate in the Range (313.15 to 353.15) K, Journal of Chemical & Engineering Data. 41 (1996) 534-536. doi:10.1021/je950287t

T / K = 313.15		
P / bar	x ₁	y ₁
0.0390	0.0250	0.1210
0.0480	0.0900	0.3360
0.0515	0.1160	0.3980
0.0575	0.1570	0.4850
0.0640	0.2160	0.5760
0.0715	0.2770	0.6510
0.0805	0.3490	0.7110
0.0890	0.4280	0.7700
0.0995	0.5040	0.8240
0.1075	0.5830	0.8620
0.1170	0.6580	0.8950
0.1235	0.7270	0.9200
0.1335	0.8030	0.9440
0.1470	0.9350	0.9830

Comelli, Fabio - Francesconi, Romolo - Ottani, Stefano, Isothermal Vapor–Liquid Equilibria of Dimethyl Carbonate + Diethyl Carbonate in the Range (313.15 to 353.15) K, Journal of Chemical & Engineering Data. 41 (1996) 534-536. doi:10.1021/je950287t

T / K = 323.15		
P / bar	x ₁	y ₁
0.0650	0.0270	0.1150
0.0810	0.1040	0.3460
0.0885	0.1510	0.4450
0.0975	0.2010	0.5320
0.1130	0.2800	0.6430
0.1210	0.3250	0.6800
0.1290	0.3710	0.7190
0.1450	0.4620	0.7850
0.1600	0.5430	0.8320
0.1690	0.5940	0.8600
0.1820	0.6600	0.8910
0.1940	0.7330	0.9160
0.2060	0.8090	0.9440
0.2190	0.8880	0.9680
0.2305	0.9730	0.9920

Comelli, Fabio - Francesconi, Romolo - Ottani, Stefano, Isothermal Vapor–Liquid Equilibria of Dimethyl Carbonate + Diethyl Carbonate in the Range (313.15 to 353.15) K,

Journal of Chemical & Engineering Data. 41 (1996) 534-536. doi:10.1021/je950287t

T / K = 333.15		
P / bar	x ₁	y ₁
0.1100	0.0630	0.2060
0.1180	0.0930	0.2860
0.1443	0.1830	0.4750
0.1650	0.2550	0.5810
0.1895	0.3440	0.6840
0.2005	0.3860	0.7220
0.2175	0.4490	0.7670
0.2360	0.5150	0.8120
0.2515	0.5710	0.8440
0.2705	0.6460	0.8800
0.2880	0.7110	0.9080
0.3040	0.7840	0.9300
0.3140	0.8260	0.9460
0.3360	0.9270	0.9760

Comelli, Fabio - Francesconi, Romolo - Ottani, Stefano, Isothermal Vapor–Liquid Equilibria of Dimethyl Carbonate + Diethyl Carbonate in the Range (313.15 to 353.15) K, Journal of Chemical & Engineering Data. 41 (1996) 534-536. doi:10.1021/je950287t

T / K = 343.15		
P / bar	x ₁	y ₁
0.1560	0.0300	0.1000
0.1740	0.0670	0.2150
0.1880	0.1000	0.3010
0.2140	0.1620	0.4250
0.2390	0.2300	0.5430
0.2600	0.2800	0.6050
0.2760	0.3270	0.6470
0.3070	0.4040	0.7210
0.3775	0.5740	0.8320
0.4005	0.6300	0.8600
0.4180	0.6720	0.8840
0.4420	0.7420	0.9100
0.4730	0.8280	0.9440
0.4825	0.8620	0.9560
0.4960	0.9080	0.9720
0.5035	0.9350	0.9800

Comelli, Fabio - Francesconi, Romolo - Ottani, Stefano, Isothermal Vapor–Liquid Equilibria of Dimethyl Carbonate + Diethyl Carbonate in the Range (313.15 to 353.15) K, Journal of Chemical & Engineering Data. 41 (1996) 534-536. doi:10.1021/je950287t

T / K = 353.15		
P / bar	x ₁	y ₁
0.2400	0.0430	0.1500

HA-HA or HD-HD systems (BAC = 4)

0.2855	0.1190	0.3380	171.00	0.5899
0.3120	0.1700	0.4250	156.00	0.6834
0.3520	0.2410	0.5380	140.00	0.7421
0.3705	0.2750	0.5800	113.00	0.8119
0.3945	0.3240	0.6220	96.00	0.8520
0.4525	0.4200	0.7190	71.00	0.8962
0.4800	0.4750	0.7570	59.00	0.9201
0.5185	0.5430	0.8000	39.00	0.9453
0.5765	0.6670	0.8660	20.00	0.9719
0.6100	0.7270	0.8970		
0.6380	0.7830	0.9250		
0.6730	0.8500	0.9500		
0.7000	0.9040	0.9680		

Francesconi, Romolo - Comelli, Fabio, Excess Molar Enthalpies, Densities, and Excess Molar Volumes of Binary Mixtures Containing Esters of Carbonic Acid at 298.15 and 313.15 K, Journal of Chemical & Engineering Data. 40 (1995) 811-814. doi:10.1021/je00020a016

T / K = 313.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1
27.00	0.0565
51.00	0.1069
75.00	0.1522
89.00	0.1932
114.00	0.2643
132.00	0.3238
154.00	0.4181
162.00	0.4892
162.00	0.5896
146.00	0.6831
132.00	0.7418
111.00	0.8117
88.00	0.8518
66.00	0.8995
52.00	0.9200
35.00	0.9452
19.00	0.9718

Isobaric phase equilibrium data

Luo, Hu-Ping - Xiao, Wen-De - Zhu, Kai-Hong, Isobaric vapor-liquid equilibria of alkyl carbonates with alcohols, Fluid Phase Equilibria. 175 (2000) 91-105. doi:10.1016/S0378-3812(00)00444-1

P / bar = 1.0000

T / K	x_1	y_1
394.44	0.0680	0.1920
390.50	0.1499	0.3626
385.95	0.2356	0.5190
381.80	0.3406	0.6411
375.92	0.5001	0.7808
371.31	0.6215	0.8508
367.46	0.7683	0.9147
364.41	0.8928	0.9646

Enthalpy of mixing

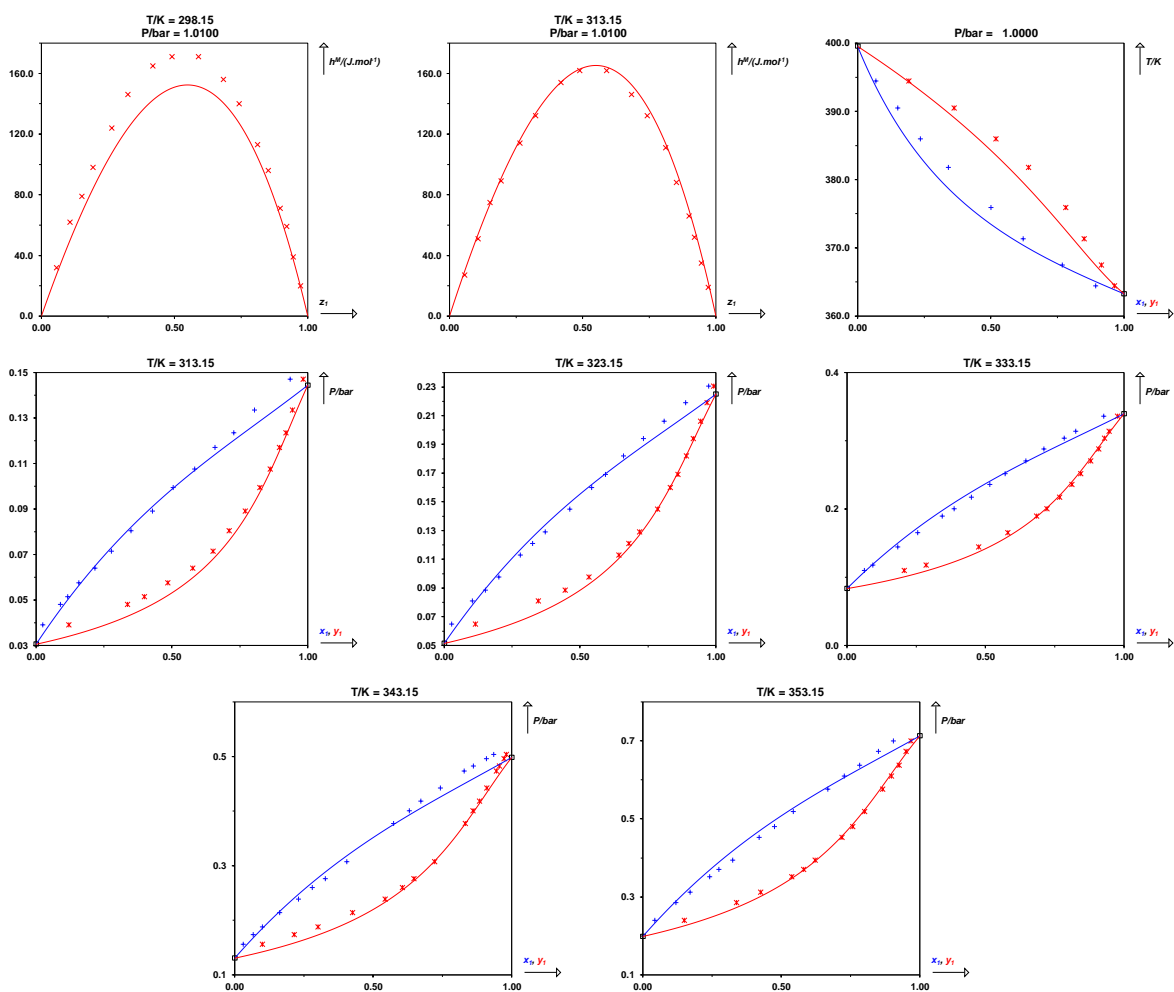
Francesconi, Romolo - Comelli, Fabio, Excess Molar Enthalpies, Densities, and Excess Molar Volumes of Binary Mixtures Containing Esters of Carbonic Acid at 298.15 and 313.15 K, Journal of Chemical & Engineering Data. 40 (1995) 811-814. doi:10.1021/je00020a016

T / K = 298.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1
32.00	0.0565
62.00	0.1070
79.00	0.1523
98.00	0.1934
124.00	0.2645
146.00	0.3241
165.00	0.4184
171.00	0.4896

HA-HA or HD-HD systems (BAC = 4)



TRIETHYLAMINE (1) + 1,4-DIOXANE (2)

CAS	121-44-8	123-91-1
InChiKey	ZMANZCXQSJIPKH-UHFFFAOYSA-N	RYHBNJHYFVUHQT-UHFFFAOYSA-N
T_c / K	535.15	587.00
P_c / bar	30.40	52.08
ω	0.316	0.279

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 49.02$

$B/\text{MPa} = 63.89$

Deviations

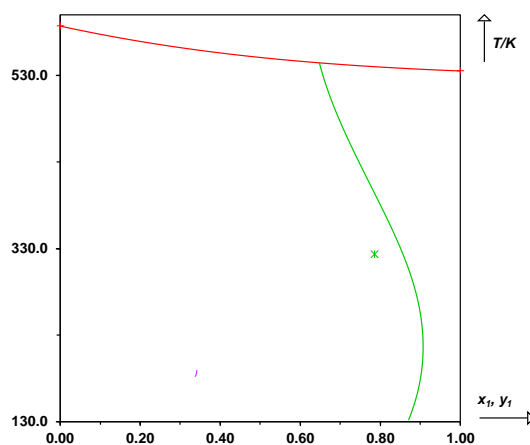
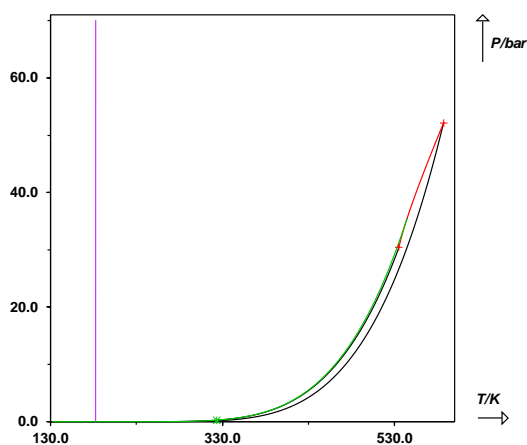
MAPE on $x = 14\%$

MAPE on $y = 15\%$

MAPE on $x_{az} = 22\%$

MAPE on $P_{az} = 0.75\%$

MAPE on $c_p^M = 104\%$



Isothermal phase equilibrium data

Bittrich, H. J. - Rodrigues, L. F. T. G., Dampf-Flüssigkeit-Gleichgewichte der Mischungen von Triethylamin mit Tetrahydrofuran und 1,4-Dioxan, Zeitschrift für Physikalische Chemie. 2690 (1988) doi:10.1515/zpch-1988-26997

T / K =	323.20	
P / bar	x ₁	y ₁
0.2252	0.1880	0.4350
0.2464	0.3240	0.5420
0.2576	0.4430	0.5960
0.2716	0.6760	0.7160
0.2734	0.7700	0.7800
0.2733	0.7820	0.7840
0.2733	0.7850	0.7850
0.2727	0.8220	0.8280
0.2709	0.9080	0.8940

AZEO

Bittrich, H. J. - Rodrigues, L. F. T. G., Dampf-Flüssigkeit-Gleichgewichte der Mischungen von Triethylamin mit Tetrahydrofuran und 1,4-Dioxan, Zeitschrift für Physikalische Chemie. 2690 (1988) doi:10.1515/zpch-1988-26997

T / K =	343.20	
P / bar	x ₁	y ₁
0.3660	0.0120	0.0700
0.3882	0.0350	0.1550
0.4109	0.0700	0.2380
0.4368	0.1080	0.2840
0.4821	0.2160	0.4180
0.4954	0.2480	0.4500
0.5229	0.3450	0.5200
0.5360	0.4060	0.5360
0.5485	0.4740	0.5920
0.5524	0.5100	0.6220
0.5541	0.5320	0.6140
0.5563	0.5460	0.6380
0.5640	0.6400	0.6740
0.5668	0.7000	0.7060
0.5672	0.7720	0.7770
0.5614	0.8760	0.8860
0.5510	0.9740	0.9600

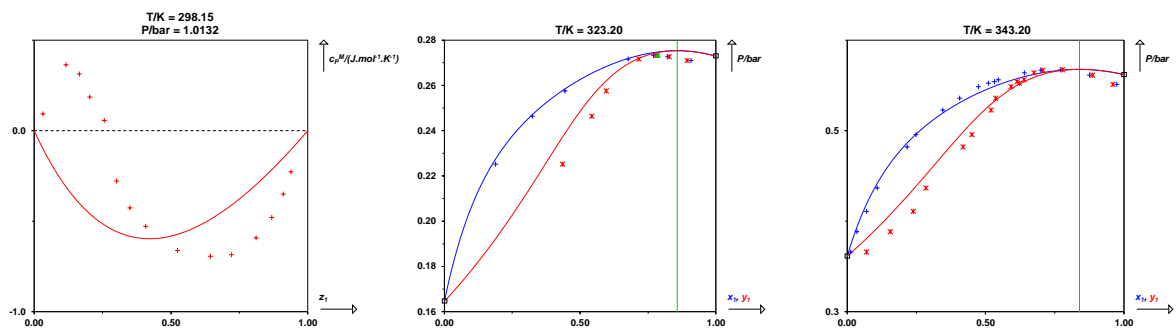
Heat capacity of mixing

Grolier, J. -P. E. - Roux-Desgranges, G. - Berkane, M. - Wilhelm, Emmerich, Heat capacities and densities of mixtures of very polar substances. 3. Mixtures containing either trichloromethane or 1,4-dioxane or

diisopropylether, Journal of Solution Chemistry. 23 (1994) 153-166. doi:10.1007/BF00973543

T / K =	298.15
P / bar =	UNKNOWN (1.0132)
cp ^M / J.mol ⁻¹ .K ⁻¹	x ₁
0.0920	0.0319
0.3640	0.1166
0.3140	0.1654
0.1850	0.2032
0.0560	0.2567
-0.2780	0.3007
-0.4270	0.3497
-0.5290	0.4072
-0.6630	0.5233
-0.6930	0.6436
-0.6860	0.7207
-0.5930	0.8110
-0.4790	0.8687
-0.3510	0.9103
-0.2280	0.9390

HA-HA or HD-HD systems (BAC = 4)



1,1,1,2-TETRAFLUOROETHANE (1) + 1,1-DIFLUOROETHANE (2)

CAS	811-97-2	75-37-6
InChiKey	LVGUZGTVOIAKKC-UHFFFAOYSA-N	NPNPZTNLOVBDOC-UHFFFAOYSA-N
T_c / K	374.18	386.44
P_c / bar	40.56	45.20
ω	0.327	0.275

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

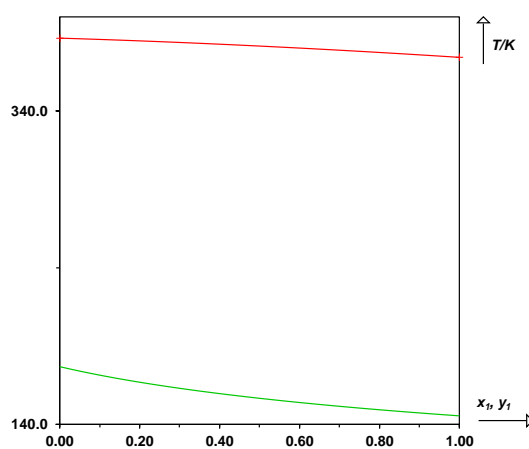
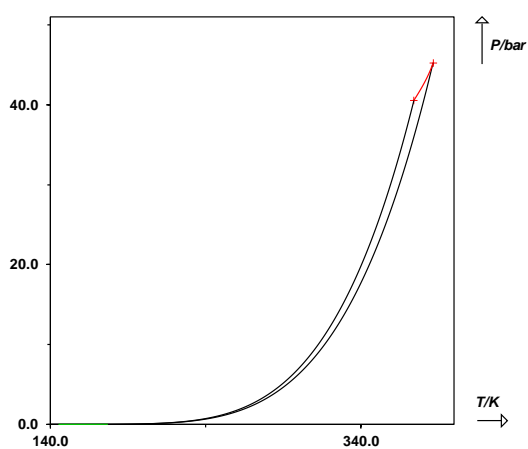
A/MPa = -4.361

B/MPa = 3.973

Deviations

MAPE on x = 5.9 %

MAPE on y = 6.1 %



Isothermal phase equilibrium data			P / bar	x_1	y_1						
Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4 T / K = 255.00			7.024	0.2845	0.3007						
			7.087	0.3817	0.4003						
			7.155	0.4871	0.5067						
			7.209	0.5664	0.5862						
			7.291	0.6798	0.6994						
			7.339	0.7377	0.7567						
			7.414	0.8170	0.8339						
			7.449	0.8495	0.8652						
			7.554	0.9344	0.9436						
			Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4 T / K = 275.00			9.092	0.0518	0.0545			
9.132	0.1131	0.1196									
9.192	0.1897	0.2011									
9.275	0.2841	0.3008									
9.369	0.3804	0.4015									
9.479	0.4858	0.5092									
9.567	0.5653	0.5890									
9.699	0.6788	0.7006									
9.769	0.7369	0.7566									
9.868	0.8164	0.8321									
Kleiber, Michael, Vapor-liquid equilibria of binary refrigerant mixtures containing propylene or R134a, Fluid Phase Equilibria. 92 (1994) 149-194. doi:10.1016/0378-3812(94)80046-4 T / K = 298.00			9.909	0.8491	0.8628						
			10.02	0.9344	0.9412						
			6.084	0.3195	0.3365						
			6.162	0.4460	0.4656						
			6.233	0.5498	0.5686						
			6.313	0.6626	0.6822						
			6.394	0.7575	0.7744						
			6.509	0.8828	0.8940						
			6.597	0.9777	0.9789						
			Shi, Y. - Wang, K. - Liu, H. - Hu, Y., Measurement of vapor-liquid equilibria for 1, 1, 1, 2-tetrafluoroethane-1, 1-difluoroethane binary system, Huadong Ligong Daxue Xuebao. 21 (1995) 613-618. T / K = 303.09			12.00	0.2416	0.2527			
12.31	0.4985	0.5279									
12.69	0.7500	0.7665									
15.32	0.2410	0.2558									
15.72	0.4990	0.5155									
16.20	0.7495	0.7647									
Shi, Y. - Wang, K. - Liu, H. - Hu, Y., Measurement of vapor-liquid equilibria for 1, 1, 1, 2-tetrafluoroethane-1, 1-difluoroethane binary system, Huadong Ligong Daxue Xuebao. 21 (1995) 613-618. T / K = 303.09						6.877	0.0518	0.0554			
						6.915	0.1132	0.1211			
						6.963	0.1900	0.2022			
						Tillner-Roth, R., An experimental study of the thermodynamic properties of the refrigerant mixture: {1,1,1,2-tetrafluoroethane (R 134a) + 1,1-difluoroethane (R 152a)}, The Journal of Chemical Thermodynamics. 25 (1993) 1419-1441. doi:10.1006/jcht.1993.1144 T / K = 323.15			6.877	0.0518	0.0554
			6.915	0.1132	0.1211						
			6.963	0.1900	0.2022						
			Tillner-Roth, R., An experimental study of the thermodynamic properties of the refrigerant mixture: {1,1,1,2-tetrafluoroethane (R 134a) + 1,1-difluoroethane (R 152a)}, The Journal of Chemical Thermodynamics. 25 (1993) 1419-1441. doi:10.1006/jcht.1993.1144 T / K = 333.15						15.32	0.2410	0.2558
									15.72	0.4990	0.5155
									16.20	0.7495	0.7647

Tillner-Roth, R., An experimental study of the thermodynamic properties of the refrigerant mixture: {1,1,1,2-tetrafluoroethane (R 134a) + 1,1-difluoroethane (R 152a)}, The Journal of Chemical Thermodynamics. 25 (1993) 1419-1441. doi:10.1006/jcht.1993.1144

T / K = 343.15

P / bar	x_1	y_1
19.28	0.2409	0.2532
19.80	0.4986	0.5152
20.41	0.7495	0.7634

Tillner-Roth, R., An experimental study of the thermodynamic properties of the refrigerant mixture: {1,1,1,2-tetrafluoroethane (R 134a) + 1,1-difluoroethane (R 152a)}, The Journal of Chemical Thermodynamics. 25 (1993) 1419-1441. doi:10.1006/jcht.1993.1144

T / K = 353.15

P / bar	x_1	y_1
23.97	0.2402	0.2541
24.63	0.4978	0.5165
25.39	0.7492	0.7619

Tillner-Roth, R., An experimental study of the thermodynamic properties of the refrigerant mixture: {1,1,1,2-tetrafluoroethane (R 134a) + 1,1-difluoroethane (R 152a)}, The Journal of Chemical Thermodynamics. 25 (1993) 1419-1441. doi:10.1006/jcht.1993.1144

T / K = 363.15

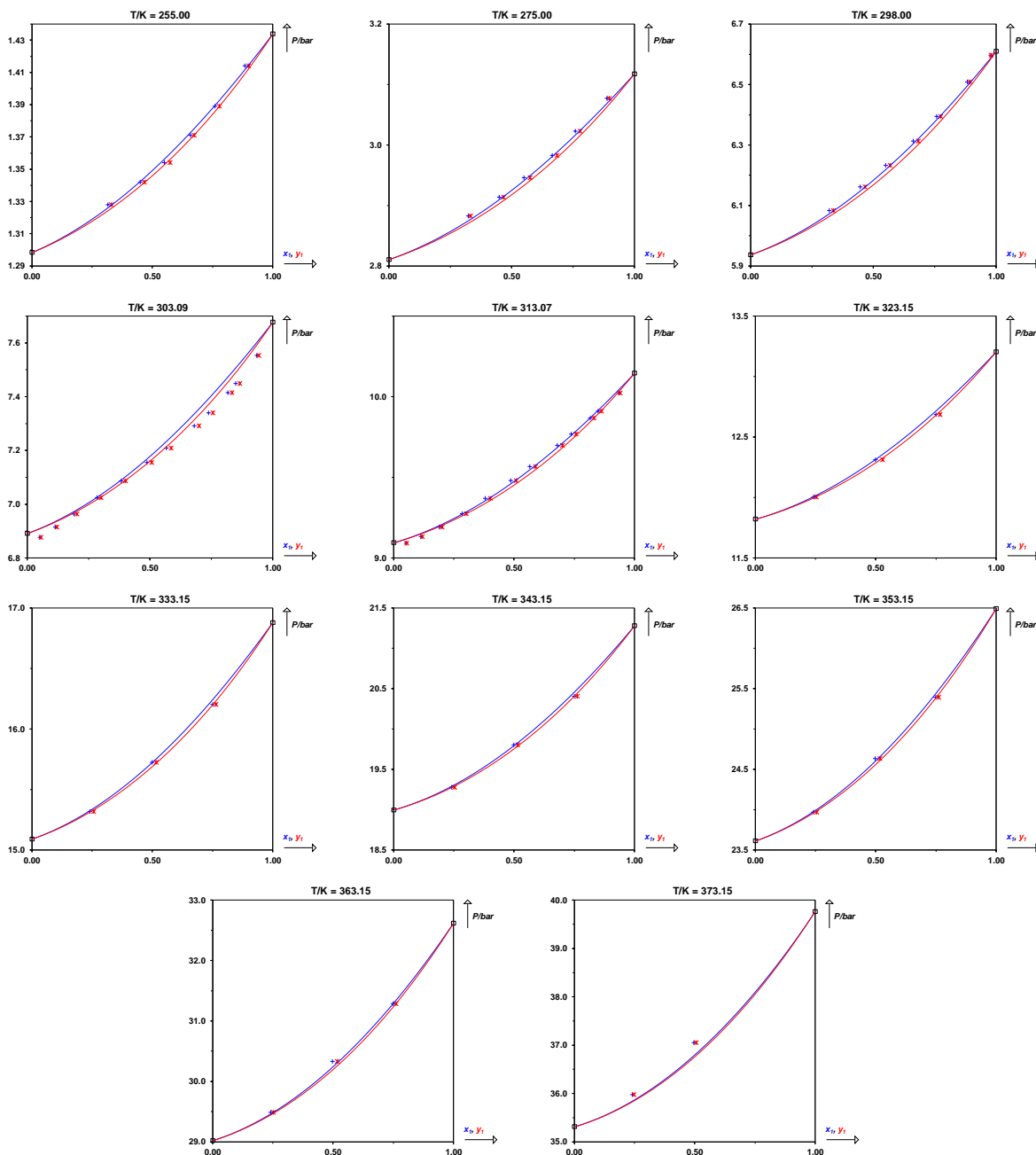
P / bar	x_1	y_1
29.49	0.2400	0.2512
30.33	0.4978	0.5165
31.29	0.7487	0.7608

Tillner-Roth, R., An experimental study of the thermodynamic properties of the refrigerant mixture: {1,1,1,2-tetrafluoroethane (R 134a) + 1,1-difluoroethane (R 152a)}, The Journal of Chemical Thermodynamics. 25 (1993) 1419-1441. doi:10.1006/jcht.1993.1144

T / K = 373.15

P / bar	x_1	y_1
35.98	0.2402	0.2474
37.06	0.4959	0.5058

HA-HA or HD-HD systems (BAC = 4)



n-BUTYL ACETATE (1) + N,N-DIMETHYLFORMAMIDE (2)

CAS	123-86-4	68-12-2
InChiKey	DKPFZGUDAPQIHT-UHFFFAOYSA-N	ZMXDDKWLCZADIW-UHFFFAOYSA-N
T_c / K	575.40	649.60
P_c / bar	30.90	44.20
ω	0.439	0.318

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 29.01

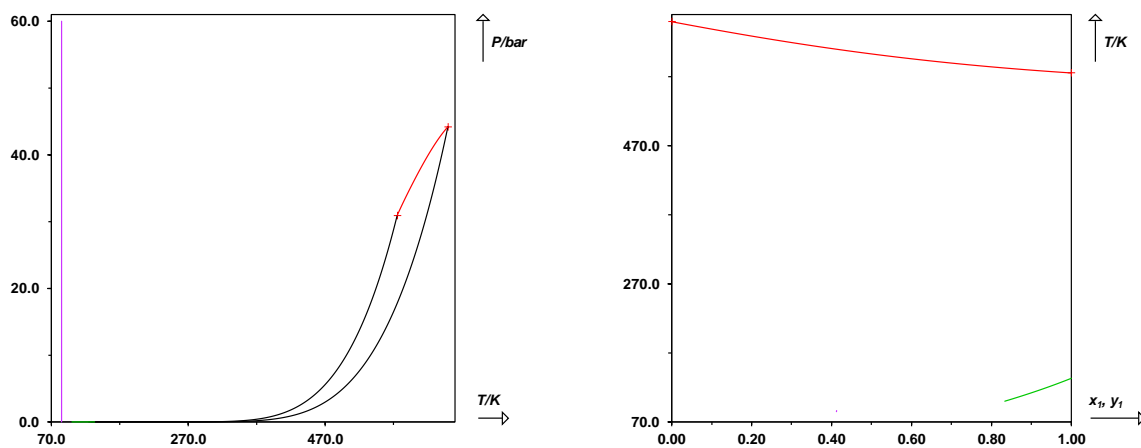
B/MPa = 22.17

Deviations

MAPE on x = 10 %

MAPE on y = 13 %

MAPE on h^M = 6.5 %



Isothermal phase equilibrium data

Shealy, Glenn S. - Sandler, Stanley I., Vapor-liquid equilibrium for four mixtures containing N,N-dimethylformamide, Journal of Chemical & Engineering Data. 30 (1985) 455-459. doi:10.1021/je00042a026

T / K =	363.15	
P / bar	x ₁	y ₁
0.1347	0.0103	0.0473
0.1435	0.0291	0.1206
0.1588	0.0629	0.2309
0.1765	0.1105	0.3410
0.1962	0.1733	0.4414
0.2093	0.2222	0.5074
0.2148	0.2540	0.5339
0.2305	0.3143	0.5956
0.2446	0.3906	0.6497
0.2584	0.4720	0.6991
0.2713	0.5601	0.7481
0.2824	0.6536	0.7947
0.2933	0.7491	0.8399
0.3016	0.8287	0.8790
0.3069	0.8899	0.9217
0.3110	0.9409	0.9556
0.3130	0.9771	0.9811

Shealy, Glenn S. - Sandler, Stanley I., Vapor-liquid equilibrium for four mixtures containing N,N-dimethylformamide, Journal of Chemical & Engineering Data. 30 (1985) 455-459. doi:10.1021/je00042a026

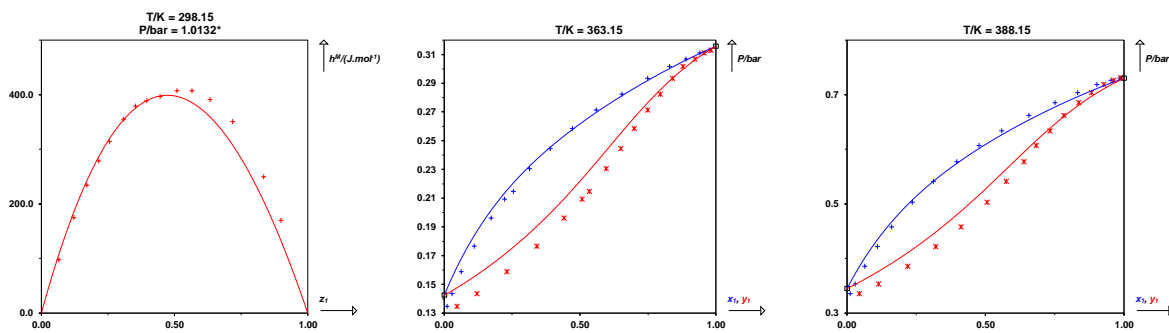
T / K =	388.15	
P / bar	x ₁	y ₁
0.3355	0.0118	0.0440
0.3534	0.0299	0.1138
0.3855	0.0641	0.2187
0.4220	0.1095	0.3196
0.4581	0.1610	0.4120
0.5031	0.2363	0.5054
0.5414	0.3119	0.5754
0.5775	0.3957	0.6391
0.6070	0.4760	0.6833
0.6335	0.5578	0.7325
0.6617	0.6572	0.7832
0.6855	0.7504	0.8360
0.7035	0.8327	0.8826
0.7184	0.9020	0.9260
0.7266	0.9531	0.9622
0.7307	0.9852	0.9871

Enthalpy of mixing

Venkatesu, P. - Ramadevi, R. S. - Prabhakara Rao, M. V. - Prasad, D. H. L., Excess Molar Enthalpies of N,N-Dimethylformamide with Chloroethanes and Acetates at 298.15 K, Journal of Chemical & Engineering Data. 45 (2000) 515-517. doi:10.1021/je990286r

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
170.00	0.8998	
250.00	0.8344	
351.00	0.7179	
391.00	0.6326	
407.00	0.5656	
407.00	0.5092	
397.00	0.4454	
389.00	0.3956	
379.00	0.3536	
355.00	0.3089	
314.00	0.2558	
279.00	0.2151	
234.00	0.1702	
175.00	0.1208	
98.00	0.0650	

HA-HA or HD-HD systems (BAC = 4)



PENTAFLUOROETHANE (1) + 1,1,1,2-TETRAFLUOROETHANE (2)

CAS	354-33-6	811-97-2
InChiKey	GTLACDSXYULKMZ-UHFFFAOYSA-N	LVGUZGTVOIAKKC-UHFFFAOYSA-N
T_c / K	339.17	374.18
P_c / bar	36.20	40.56
ω	0.305	0.327

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 3.181

B/MPa = 10.21

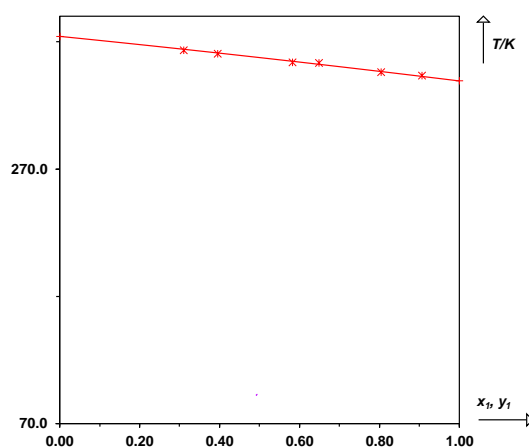
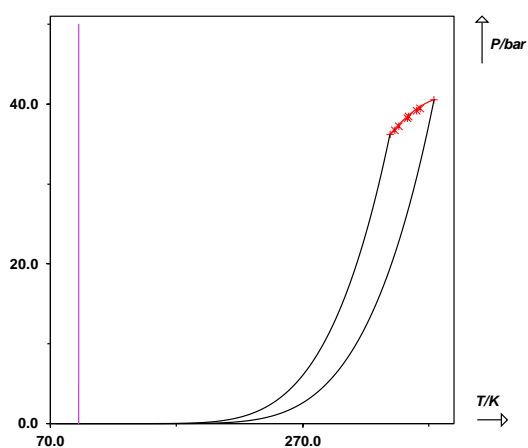
Deviations

MAPE on x = 3.2 %

MAPE on y = 3.5 %

MAPE on x_c = 5.2 %

MAPE on P_c = 0.57 %



Isothermal phase equilibrium data

Nagel, M. - Bier, K., Vapor-liquid equilibria of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 203.15

P / bar	y_1
0.1415	0.5764
0.1907	0.7847
0.2461	0.9126

Nagel, M. - Bier, K., Vapor-liquid equilibria of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 203.15

P / bar	x_1
0.1410	0.2687
0.1913	0.4924
0.2458	0.7465

Nagel, M. - Bier, K., Vapor-liquid equilibria of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 243.15

P / bar	y_1
1.250	0.4850
1.578	0.7129
1.929	0.8793

Nagel, M. - Bier, K., Vapor-liquid equilibria of new refrigerant mixtures as alternatives to R 22 and R 502, DKV-Tagungsberichte. 20/2.1 (1993) 39-59.

T / K = 243.15

P / bar	x_1
1.247	0.2679
1.575	0.4897
1.929	0.7447

Kim, C.N. - Park, Y.M., Vapor-Liquid Equilibrium of HFC-32/134a And HFC-125/134a Systems, Int. J. Thermophys. 20 (1999) 519-530. doi:10.1023/A:1022605104490

T / K = 263.15

P / bar	x_1	y_1
2.537	0.1853	0.3513
2.946	0.3258	0.5324
3.450	0.5084	0.6921
3.750	0.6265	0.7770
4.317	0.8136	0.8947

Kobayashi, Masanao - Nishiumi, Hideo, Vapor-liquid equilibria for the pure, binary and ternary systems

containing HFC32, HFC125 and HFC134a, Fluid Phase Equilibria. 144 (1998) 191-202. doi:10.1016/S0378-3812(97)00257-4

T / K = 273.15

P / bar	x_1	y_1
3.080	0.0380	0.0770
3.410	0.1260	0.2250
3.900	0.2560	0.4140
4.380	0.3810	0.5570
4.920	0.5190	0.6930
5.420	0.6610	0.7950
5.910	0.7840	0.8790
6.330	0.8960	0.9440

Kim, C.N. - Park, Y.M., Vapor-Liquid Equilibrium of HFC-32/134a And HFC-125/134a Systems, Int. J. Thermophys. 20 (1999) 519-530. doi:10.1023/A:1022605104490

T / K = 273.15

P / bar	x_1	y_1
3.689	0.2000	0.3622
4.138	0.3258	0.5043
4.833	0.5061	0.6734
5.273	0.6228	0.7663
6.004	0.8120	0.8910

Kobayashi, Masanao - Nishiumi, Hideo, Vapor-liquid equilibria for the pure, binary and ternary systems containing HFC32, HFC125 and HFC134a, Fluid Phase Equilibria. 144 (1998) 191-202. doi:10.1016/S0378-3812(97)00257-4

T / K = 283.15

P / bar	x_1	y_1
4.420	0.0490	0.0940
4.930	0.1600	0.2710
5.420	0.2640	0.4070
5.910	0.3600	0.5120
6.450	0.4720	0.6310
7.130	0.6090	0.7510
8.020	0.7860	0.8730
8.820	0.9440	0.9700

Kim, C.N. - Park, Y.M., Vapor-Liquid Equilibrium of HFC-32/134a And HFC-125/134a Systems, Int. J. Thermophys. 20 (1999) 519-530. doi:10.1023/A:1022605104490

T / K = 283.15

P / bar	x_1	y_1
5.139	0.1992	0.3516
5.826	0.3466	0.5064
6.597	0.4884	0.6562
7.099	0.6084	0.7482
8.164	0.8102	0.8819

Kobayashi, Masanao - Nishiumi, Hideo, Vapor-liquid equilibria for the pure, binary and ternary systems containing HFC32, HFC125 and HFC134a, Fluid Phase Equilibria. 144 (1998) 191-202. doi:10.1016/S0378-3812(97)00257-4

T / K = 293.15

P / bar	x_1	y_1
6.060	0.0550	0.0970
6.580	0.1370	0.2300
7.320	0.2550	0.3860
8.160	0.3810	0.5350
9.030	0.5260	0.6620
9.830	0.6570	0.7700
11.58	0.9310	0.9580

Kim, C.N. - Park, Y.M., Vapor-Liquid Equilibrium of HFC-32/134a And HFC-125/134a Systems, Int. J. Thermophys. 20 (1999) 519-530. doi:10.1023/A:1022605104490

T / K = 293.15

P / bar	x_1	y_1
6.813	0.1794	0.3081
7.793	0.3461	0.4836
8.718	0.4898	0.6324
9.935	0.6646	0.7782
10.84	0.8078	0.8767

Kim, C.N. - Park, Y.M., Vapor-Liquid Equilibrium of HFC-32/134a And HFC-125/134a Systems, Int. J. Thermophys. 20 (1999) 519-530. doi:10.1023/A:1022605104490

T / K = 303.15

P / bar	x_1	y_1
9.083	0.1786	0.2802
10.22	0.3298	0.4562
11.38	0.4737	0.6215
12.89	0.6597	0.7657
14.09	0.8075	0.8648

Nishiumi, Hideo - Ohno, Takahiro, High pressure vapor-liquid equilibria and critical loci for the HFC125-HFC134a system, Korean Journal of Chemical Engineering. 17 (2000) 668-671. doi:10.1007/BF02699115

T / K = 333.13

P / bar	x_1	y_1
18.65	0.0715	0.1705
19.63	0.1685	0.3130
20.42	0.2660	0.3680
21.69	0.3650	0.4755
23.56	0.4910	0.5865
25.71	0.6435	0.7170
28.46	0.8050	0.8505
30.42	0.9380	0.9510

Nishiumi, Hideo - Ohno, Takahiro, High pressure vapor-liquid equilibria and critical loci for the HFC125-HFC134a system, Korean Journal of Chemical Engineering. 17 (2000) 668-671. doi:10.1007/BF02699115

T / K = 343.13

P / bar	x_1	y_1	
22.48	0.0990	0.1366	
24.12	0.2023	0.2670	
26.30	0.3210	0.3940	
28.02	0.4200	0.4910	
29.80	0.5153	0.5870	
31.38	0.6032	0.6643	
32.74	0.6748	0.7237	
34.44	0.7688	0.7995	
35.42	0.8199	0.8410	
36.69	0.9070	0.9070	CRIT

Nishiumi, Hideo - Ohno, Takahiro, High pressure vapor-liquid equilibria and critical loci for the HFC125-HFC134a system, Korean Journal of Chemical Engineering. 17 (2000) 668-671. doi:10.1007/BF02699115

T / K = 353.13

P / bar	x_1	y_1	
28.23	0.1120	0.1449	
28.51	0.1240	0.1585	
30.07	0.2050	0.2548	
31.60	0.2760	0.3320	
33.56	0.3700	0.4260	
35.37	0.4550	0.5050	
37.09	0.5395	0.5757	
38.22	0.6490	0.6490	CRIT

Nishiumi, Hideo - Ohno, Takahiro, High pressure vapor-liquid equilibria and critical loci for the HFC125-HFC134a system, Korean Journal of Chemical Engineering. 17 (2000) 668-671. doi:10.1007/BF02699115

T / K = 363.12

P / bar	x_1	y_1
34.94	0.1132	0.1371
35.77	0.1483	0.1766
37.19	0.2022	0.2333
38.07	0.2366	0.2677
39.25	0.2892	0.3095

Critical point

Kato, Ryo - Nishiumi, Hideo, Vapor-liquid equilibria and critical loci of binary and ternary systems composed of CH₂F₂, C₂H₅F and C₂H₂F₄, Fluid Phase Equilibria. 249 (2006) 140-146. doi:10.1016/j.fluid.2006.07.017

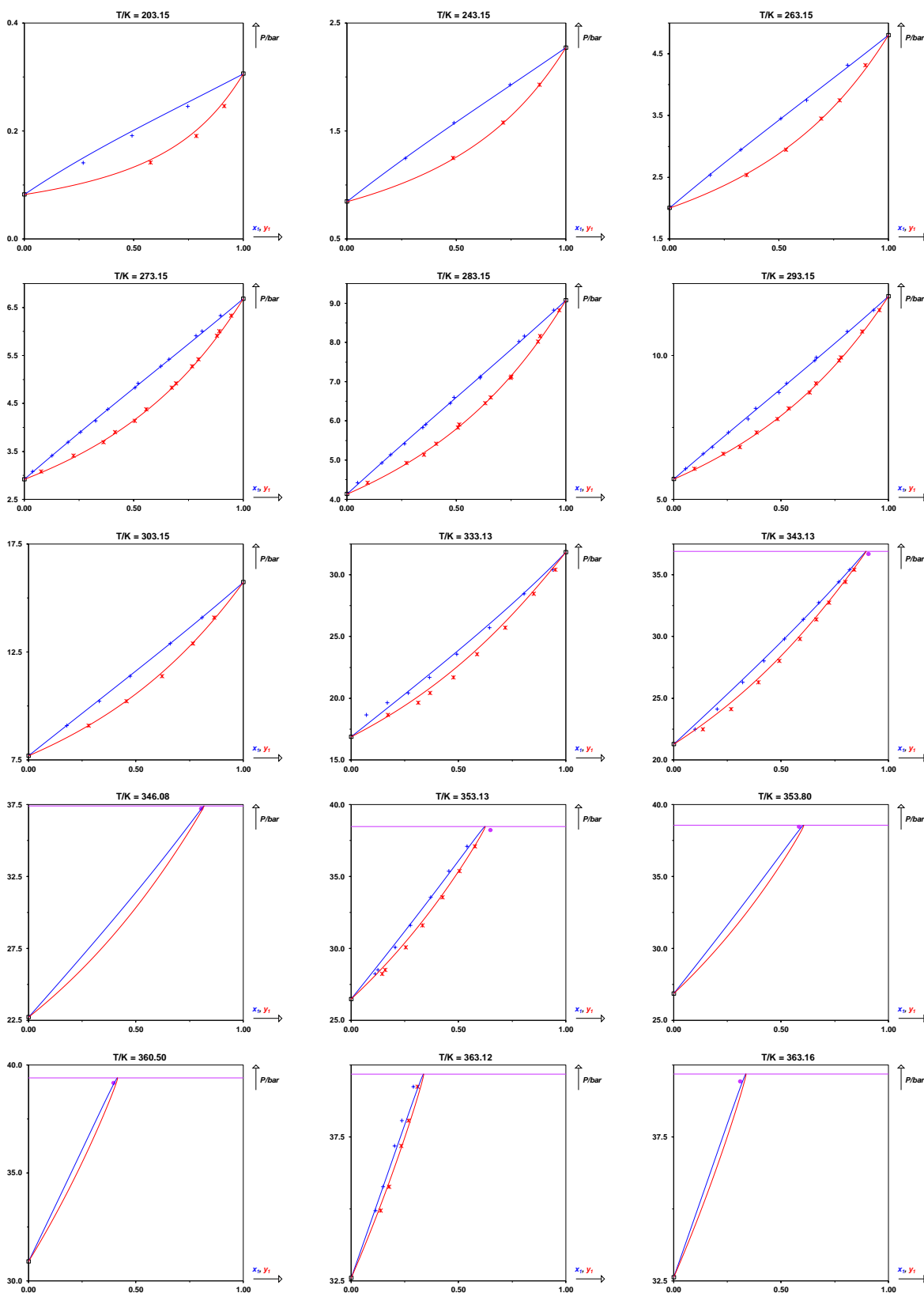
T / K P / bar x_1

346.08	37.20	0.8040
353.80	38.44	0.5830
360.50	39.16	0.3950

Nishiumi, Hideo - Ohno, Takahiro, High pressure vapor-liquid equilibria and critical loci for the HFC125-HFC134a system, Korean Journal of Chemical Engineering. 17 (2000) 668-671. doi:10.1007/BF02699115

T / K	P / bar	x_1
363.16	39.42	0.3095

HA-HA or HD-HD systems (BAC = 4)



NITROGEN (1) + AMMONIA (2)

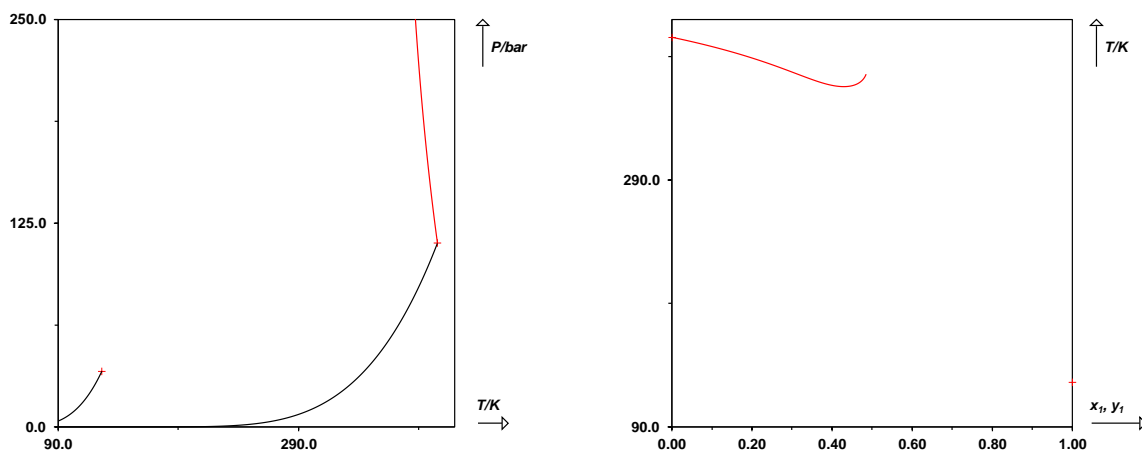
CAS	7727-37-9	7664-41-7
InChiKey	MDFFN0EWAXZRQ-UHFFFAOYSA-N	QGZKDVFNNGYKY-UHFFFAOYSA-N
T_c / K	126.20	405.65
P_c / bar	34.00	112.80
ω	0.038	0.253

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

A/MPa = 698.3

B/MPa = 2047

*Deviations*MAPE on x = 17 %MAPE on y = 6.6 %MAPE on h^M = 24 %

Isothermal phase equilibrium data

Reamer, H. H. - Sage, B. H., Phase Behavior in the Nitrogen-Ammonia System., Journal of Chemical & Engineering Data. 4 (1959) 303-305. doi:10.1021/je60004a005

T / K = 277.59

P / bar	x ₁	y ₁
34.48	0.0021	0.8364
68.95	0.0043	0.9064
103.42	0.0064	0.9270
137.90	0.0083	0.9361
172.37	0.0101	0.9395
206.85	0.0117	0.9400
241.31	0.0131	0.9405
275.79	0.0142	0.9408
310.27	0.0152	0.9410
344.74	0.0161	0.9415
379.21	0.0168	0.9420
413.69	0.0175	0.9430

Reamer, H. H. - Sage, B. H., Phase Behavior in the Nitrogen-Ammonia System., Journal of Chemical & Engineering Data. 4 (1959) 303-305. doi:10.1021/je60004a005

T / K = 310.93

P / bar	x ₁	y ₁
34.48	0.0027	0.5200
68.95	0.0071	0.7180
103.42	0.0113	0.7905
137.90	0.0152	0.8275
172.37	0.0188	0.8461
206.85	0.0221	0.8550
241.31	0.0251	0.8605
275.79	0.0278	0.8635
310.27	0.0303	0.8655
344.74	0.0327	0.8675
379.21	0.0349	0.8690
413.69	0.0369	0.8700

Lindroos, A.E. - Dodge, B.F., Phase-equilibria at high pressures; the system nitrogen-ammonia at pressures above 1000 atmospheres, Chem. Eng. Progr. Symp. Ser. 48 (1952) 10-17.

T / K = 323.15

P / bar	x ₁	y ₁
978.29	0.0720	0.8490
1160.2	0.0710	0.8580
1365.9	0.0740	0.8670
1844.1	0.0820	0.9080

2270.2	0.0770	0.9190
2854.3	0.0600	0.9150
3286.0	0.0620	0.9120
3810.3	0.0730	0.9380

Reamer, H. H. - Sage, B. H., Phase Behavior in the Nitrogen-Ammonia System., Journal of Chemical & Engineering Data. 4 (1959) 303-305. doi:10.1021/je60004a005

T / K = 344.26

P / bar	x ₁	y ₁
34.48	0.0001	0.0103
68.95	0.0084	0.4090
103.42	0.0162	0.5408
137.90	0.0239	0.6055
172.37	0.0315	0.6452
206.85	0.0389	0.6695
241.31	0.0463	0.6820
275.79	0.0530	0.6885
310.27	0.0595	0.6920
344.74	0.0658	0.6940
379.21	0.0718	0.6950
413.69	0.0777	0.6955

Reamer, H. H. - Sage, B. H., Phase Behavior in the Nitrogen-Ammonia System., Journal of Chemical & Engineering Data. 4 (1959) 303-305. doi:10.1021/je60004a005

T / K = 377.59

P / bar	x ₁	y ₁
68.95	0.0005	0.0105
103.42	0.0163	0.1975
137.90	0.0324	0.2850
172.37	0.0502	0.3333
206.85	0.0700	0.3540
241.31	0.0944	0.3640
275.79	0.1262	0.3628
310.27	0.1555	0.3200

Reamer, H. H. - Sage, B. H., Phase Behavior in the Nitrogen-Ammonia System., Journal of Chemical & Engineering Data. 4 (1959) 303-305. doi:10.1021/je60004a005

T / K = 394.26

P / bar	x ₁	y ₁
103.42	0.0089	0.0510
137.90	0.0379	0.1290
172.37	0.0696	0.1315

Enthalpy of mixing

 Naumowicz-Węglińska, E - Wóycicki, W, Excess enthalpies of gaseous mixtures containing ammonia 2. (Ammonia + nitrogen) and (ammonia + methane), The Journal of Chemical Thermodynamics. 18 (1986) 1047-1052. doi:10.1016/0021-9614(86)90019-4

T / K = 313.15

P / bar = 8.110

$h^M / \text{J.mol}^{-1}$	z_1
81.90	0.1220
110.40	0.1960
130.40	0.2850
135.90	0.3340
149.50	0.4230
142.70	0.5030
129.50	0.5830
124.90	0.6340
93.60	0.7090
87.40	0.7600

Naumowicz-Węglińska, E - Wóycicki, W, Excess enthalpies of gaseous mixtures containing ammonia 2. (Ammonia + nitrogen) and (ammonia + methane), The Journal of Chemical Thermodynamics. 18 (1986) 1047-1052. doi:10.1016/0021-9614(86)90019-4

T / K = 333.15

P / bar = 14.19

$h^M / \text{J.mol}^{-1}$	z_1
87.70	0.0890
144.00	0.1590
199.10	0.3220
204.60	0.4250
169.00	0.6180
125.80	0.7350

Naumowicz-Węglińska, E - Wóycicki, W, Excess enthalpies of gaseous mixtures containing ammonia 2. (Ammonia + nitrogen) and (ammonia + methane), The Journal of Chemical Thermodynamics. 18 (1986) 1047-1052. doi:10.1016/0021-9614(86)90019-4

T / K = 313.50

P / bar = 11.15

$h^M / \text{J.mol}^{-1}$	z_1
137.50	0.1450
152.80	0.1850
167.00	0.2090
213.20	0.3710
213.30	0.4350
198.20	0.5610
194.70	0.6170
160.40	0.6920

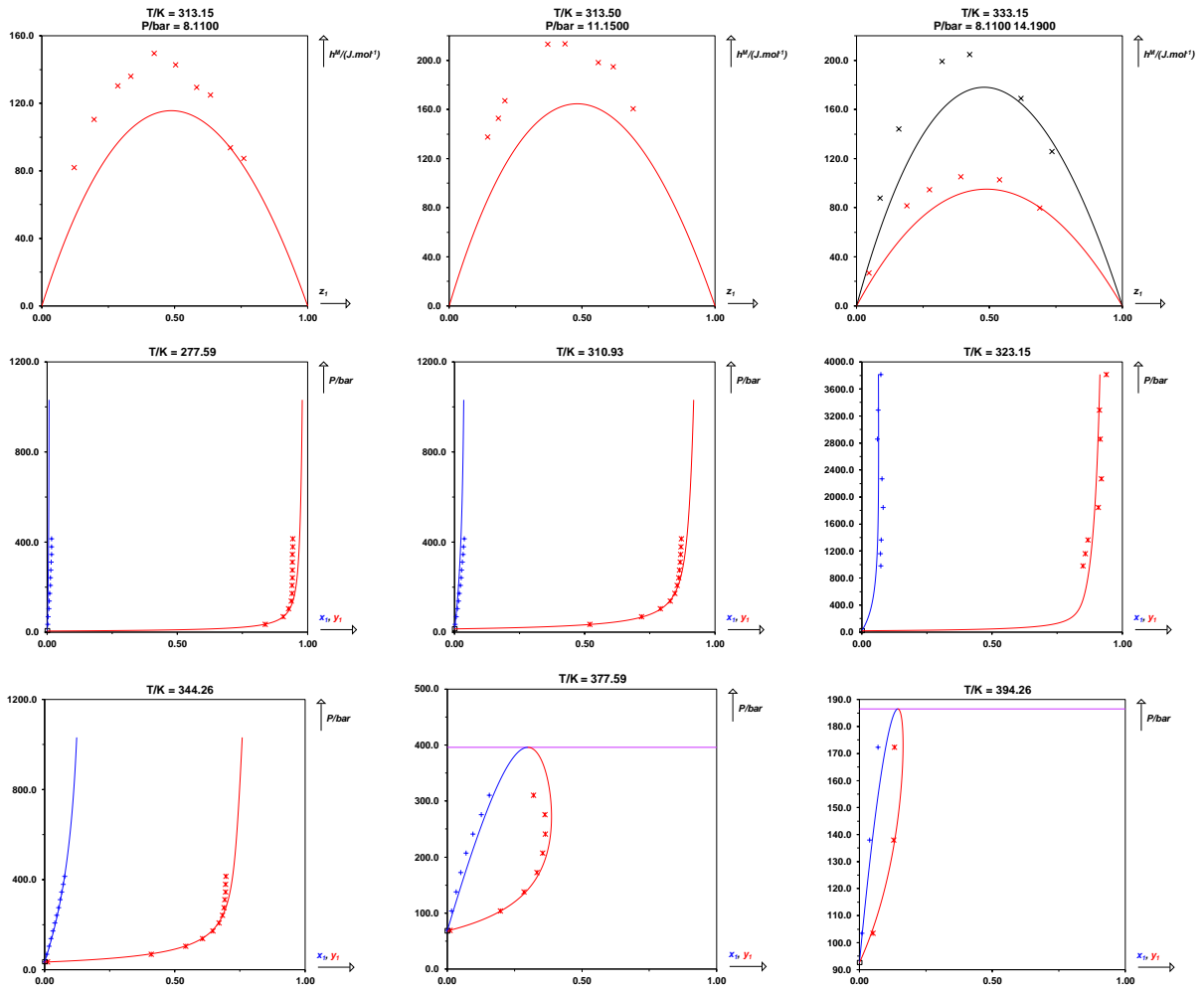
Naumowicz-Węglińska, E - Wóycicki, W, Excess enthalpies of gaseous mixtures containing ammonia 2. (Ammonia + nitrogen) and (ammonia + methane), The Journal of Chemical Thermodynamics. 18 (1986) 1047-1052. doi:10.1016/0021-9614(86)90019-4

T / K = 333.15

P / bar = 8.110

$h^M / \text{J.mol}^{-1}$	z_1
26.70	0.0470
81.60	0.1890
94.70	0.2740
105.20	0.3920
102.70	0.5380
79.80	0.6890

SA-NA systems (BAC = 5)



NITROGEN (1) + WATER (2)

CAS	7727-37-9	7732-18-5
InChiKey	MDFFN0EWAXZRQ-UHFFFAOYSA-N	XLYOFNOQVPJNP-UHFFFAOYSA-N
T_c / K	126.20	647.10
P_c / bar	34.00	220.64
ω	0.038	0.345

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 5514$

$B/\text{MPa} = 17183$

Deviations

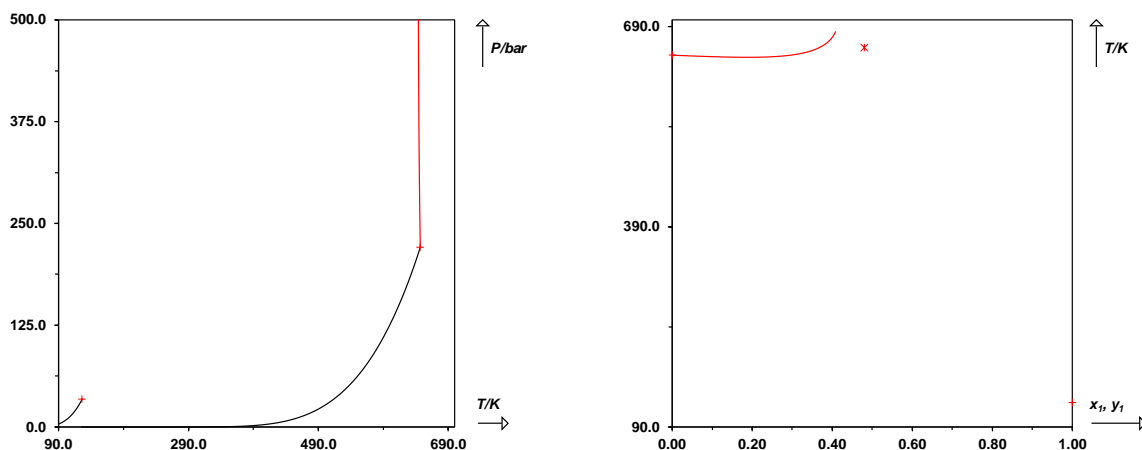
MAPE on $x = 8.4\%$

MAPE on $y = 23\%$

MAPE on $x_c = 96\%$

MAPE on $P_c = 100\%$

MAPE on $h^M = 3.2\%$



-----	101.33	0.00101652	
Isothermal phase equilibrium data	202.65	0.00181222	
-----	303.98	0.00245300	
Folas, Georgios K. - Froyna, Einar W. - Lovland, Jorgen -	506.63	0.00355560	
Kontogeorgis, Georgios M. - Solbraa, Even, Data and	810.60	0.00490673	
prediction of water content of high pressure nitrogen,	1013.3	0.00571056	
methane and natural gas, Fluid Phase Equilibria. 252			
(2007) 162-174. doi:10.1016/j.fluid.2006.12.018			
T / K = 273.15	Goodman, John B. - Krase, Norman W., Solubility of		
P / bar y_1	Nitrogen in Water at High Pressures and Temperatures,		
25.00 0.99970	Industrial & Engineering Chemistry. 23 (1931) 401-404.		
50.00 0.99986	doi:10.1021/ie50256a015		
100.00 0.99990	T / K = 298.15		
	P / bar x_1		
	101.33 0.00085996		
	126.66 0.00115700		
	202.65 0.00221521		
	303.98 0.00260746		
Goodman, John B. - Krase, Norman W., Solubility of			
Nitrogen in Water at High Pressures and Temperatures,			
Industrial & Engineering Chemistry. 23 (1931) 401-404.			
doi:10.1021/ie50256a015			
T / K = 273.15	Gillespie, P.C. - Wilson, G.M., Vapor-liquid equilibrium		
P / bar x_1	data on water-substitute gas components: N ₂ -H ₂ O, H ₂ -		
101.33 0.00117304	H ₂ O, CO-H ₂ O, H ₂ -CO-H ₂ O, and H ₂ S-H ₂ O, GPA Research		
126.66 0.00141373	Report. (1980) 1-34.		
202.65 0.00255944	T / K = 310.93		
303.98 0.00288745	P / bar x_1 y_1		
	3.447 0.0000359 0.97980		
	13.79 0.0001360 0.99498		
	31.03 0.0003000 0.99764		
	65.50 0.0006010 0.99878		
	103.42 0.0009030 0.99915		
	137.90 0.0011600 0.99931		
Rigby, Maurice - Prausnitz, John M., Solubility of water in			
compressed nitrogen, argon, and methane, The Journal of			
Physical Chemistry. 72 (1968) 330-334.			
doi:10.1021/j100847a064			
T / K = 298.15	Rigby, Maurice - Prausnitz, John M., Solubility of water in		
P / bar y_1	compressed nitrogen, argon, and methane, The Journal of		
22.49 0.998471	Physical Chemistry. 72 (1968) 330-334.		
30.90 0.998851	doi:10.1021/j100847a064		
38.70 0.999060	T / K = 323.15		
	P / bar y_1		
	21.09 0.993740		
	37.42 0.996320		
	59.82 0.997580		
	77.00 0.998044		
Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S.,			
Solubility of water in compressed nitrogen, Russ. J. Phys.			
Chem. 45 (1971) 1354-1354.			
T / K = 298.15			
P / bar y_1			
50.66 0.99934			
75.99 0.99950			
101.33 0.99955			
Wiebe, R. - Gaddy, V. L. - Heiness, Conrad, Solubility of			
Nitrogen in Water at 25°C from 25 to 1000 Atmospheres,			
Industrial & Engineering Chemistry. 24 (1932) 927-927.			
doi:10.1021/ie50272a023			
T / K = 298.15	Wiebe, R. - Gaddy, V. L. - Heiness, Conrad, The Solubility of		
P / bar x_1	Nitrogen in Water at 50, 75 and 100° from 25 to 1000		
25.33 0.00027985	Atmospheres, Journal of the American Chemical Society.		
50.66 0.00030075	55 (1933) 947-953. doi:10.1021/ja01330a011		
	T / K = 323.15		
	P / bar x_1		
	25.33 0.00021955		
	50.66 0.00042856		
	101.33 0.00081258		
	202.65 0.00146987		

SA-NA systems (BAC = 5)

303.98	0.00203418	50.66	0.00039721
506.63	0.00298341	101.33	0.00076038
810.60	0.00418217	202.65	0.00139127
1013.3	0.00490116	303.98	0.00193724

Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S., Solubility of water in compressed nitrogen, Russ. J. Phys. Chem. 45 (1971) 1354-1354.

T / K = 323.15

P / bar	y_1
50.66	0.99725
75.99	0.99801
101.33	0.99842
126.66	0.99860
151.99	0.99870
177.32	0.99878
202.65	0.99887
253.31	0.99895
303.98	0.99910
354.64	0.99917
405.30	0.99930
455.96	0.99935
506.63	0.99938

Goodman, John B. - Krase, Norman W., Solubility of Nitrogen in Water at High Pressures and Temperatures, Industrial & Engineering Chemistry. 23 (1931) 401-404. doi:10.1021/ie50256a015

T / K = 323.15

P / bar	x_1
101.33	0.00080616
126.66	0.00099645
202.65	0.00199893
303.98	0.00239936

Rigby, Maurice - Prausnitz, John M., Solubility of water in compressed nitrogen, argon, and methane, The Journal of Physical Chemistry. 72 (1968) 330-334. doi:10.1021/j100847a064

T / K = 348.15

P / bar	y_1
42.21	0.98991
61.15	0.99280
89.72	0.99477

Wiebe, R. - Gaddy, V. L. - Heins, Conrad, The Solubility of Nitrogen in Water at 50, 75 and 100° from 25 to 1000 Atmospheres, Journal of the American Chemical Society. 55 (1933) 947-953. doi:10.1021/ja01330a011

T / K = 348.15

P / bar	x_1
25.33	0.00020427

50.66	0.00039721
101.33	0.00076038
202.65	0.00139127
303.98	0.00193724
506.63	0.00287386
810.60	0.00405532
1013.3	0.00475060

Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S., Solubility of water in compressed nitrogen, Russ. J. Phys. Chem. 45 (1971) 1354-1354.

T / K = 348.15

P / bar	y_1
50.66	0.99165
75.99	0.99395
101.33	0.99500
126.66	0.99536
151.99	0.99544
177.32	0.99550
202.65	0.99552
253.31	0.99567
303.98	0.99590
354.64	0.99602
405.30	0.99622
455.96	0.99638
506.63	0.99660

Gillespie, P.C. - Wilson, G.M., Vapor-liquid equilibrium data on water-substitute gas components: N₂-H₂O, H₂-H₂O, CO-H₂O, H₂-CO-H₂O, and H₂S-H₂O, GPA Research Report. (1980) 1-34.

T / K = 366.48

P / bar	x_1	y_1
3.447	0.000023	0.76700
13.79	0.000107	0.93950
31.03	0.000248	0.97230
65.50	0.000510	0.98630
137.90	0.001011	0.99253

Rigby, Maurice - Prausnitz, John M., Solubility of water in compressed nitrogen, argon, and methane, The Journal of Physical Chemistry. 72 (1968) 330-334. doi:10.1021/j100847a064

T / K = 373.15

P / bar	y_1
57.17	0.980060
79.48	0.984970
101.52	0.987820

Wiebe, R. - Gaddy, V. L. - Heins, Conrad, The Solubility of Nitrogen in Water at 50, 75 and 100° from 25 to 1000

Atmospheres, Journal of the American Chemical Society.

55 (1933) 947-953. doi:10.1021/ja01330a011

T / K = 373.15

P / bar	x_1
25.33	0.00021392
50.66	0.00041490
101.33	0.00079250
202.65	0.00146346
303.98	0.00204380
506.63	0.00304658
810.60	0.00429702
1013.3	0.00500708

Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S.,
Solubility of water in compressed nitrogen, Russ. J. Phys.
Chem. 45 (1971) 1354-1354.

T / K = 373.15

P / bar	y_1
50.66	0.97850
75.99	0.98500
101.33	0.98830
126.66	0.99000
151.99	0.99133
177.32	0.99230
202.65	0.99315
253.31	0.99430
303.98	0.99474
354.64	0.99520
405.30	0.99555
455.96	0.99560
506.63	0.99575

Goodman, John B. - Krase, Norman W., Solubility of
Nitrogen in Water at High Pressures and Temperatures,
Industrial & Engineering Chemistry. 23 (1931) 401-404.
doi:10.1021/ie50256a015

T / K = 373.15

P / bar	x_1
101.33	0.00076680
126.66	0.00094025
202.65	0.00180661
303.98	0.00233532

Maslennikova, V.Ya., Solubility of nitrogen in water, Tr.
Gos. Nauchno Issled. Proektn. Inst. Azotn. Promst. Prod.
Org. Sin. 12 (1971) 82-87.

T / K = 473.15

P / bar	x_1
105.38	0.00191881
214.81	0.00384623
253.31	0.00456411

Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S.,
Solubility of water in compressed nitrogen, Russ. J. Phys.
Chem. 45 (1971) 1354-1354.

T / K = 473.15

P / bar	y_1
50.66	0.7790
75.99	0.8300
101.33	0.8570
126.66	0.8690
151.99	0.8780
177.32	0.8870
202.65	0.8950
253.31	0.9080
303.98	0.9180
354.64	0.9250
405.30	0.9320
455.96	0.9370
506.63	0.9410

Maslennikova, V.Ya., Solubility of nitrogen in water, Tr.
Gos. Nauchno Issled. Proektn. Inst. Azotn. Promst. Prod.
Org. Sin. 12 (1971) 82-87.

T / K = 543.15

P / bar	x_1
166.17	0.00354282
192.52	0.00398990
214.81	0.00477130

Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S.,
Solubility of water in compressed nitrogen, Russ. J. Phys.
Chem. 45 (1971) 1354-1354.

T / K = 543.15

P / bar	y_1
75.99	0.2300
101.33	0.5000
126.66	0.5980
151.99	0.6510
177.32	0.6880
202.65	0.7180
253.31	0.7570
303.98	0.7870
354.64	0.8040
405.30	0.8150
455.96	0.8210
506.63	0.8250

Maslennikova, V.Ya., Solubility of nitrogen in water, Tr.
Gos. Nauchno Issled. Proektn. Inst. Azotn. Promst. Prod.
Org. Sin. 12 (1971) 82-87.

T / K = 573.15

SA-NA systems (BAC = 5)

P / bar	x_1	455.96	0.5870
158.07	0.00396595	506.63	0.6000
197.58	0.00545603		
212.78	0.00608418		
293.84	0.00983653		
314.11	0.01082140		
374.90	0.01364670		
466.10	0.01785470		

Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S., Solubility of water in compressed nitrogen, Russ. J. Phys. Chem. 45 (1971) 1354-1354.

T / K = 573.15

P / bar	y_1
101.33	0.1000
126.66	0.2980
151.99	0.4270
177.32	0.5100
202.65	0.5680
253.31	0.6320
303.98	0.6690
354.64	0.6950
405.30	0.7140
455.96	0.7290
506.63	0.7390

Maslennikova, V.Ya., Solubility of nitrogen in water, Tr. Gos. Nauchno Issled. Proektn. Inst. Azotn. Promst. Prod. Org. Sin. 12 (1971) 82-87.

T / K = 603.15

P / bar	x_1
280.67	0.0137250
283.71	0.0138032
352.61	0.0190946
380.98	0.0209486
455.96	0.0255531
488.39	0.0276871
498.52	0.0281432

Maslennikova, V.Ya. - Vdovina, N.A. - Tsiklis, D.S., Solubility of water in compressed nitrogen, Russ. J. Phys. Chem. 45 (1971) 1354-1354.

T / K = 603.15

P / bar	y_1
151.99	0.1140
177.32	0.2320
202.65	0.3200
253.31	0.4180
303.98	0.4860
354.64	0.5330
405.30	0.5650

Enthalpy of mixing

Richards, P. - Wormald, C.J. - Yerlett, T.K., The excess enthalpy of (water + nitrogen) vapour and (water + n-heptane) vapour, The Journal of Chemical Thermodynamics. 13 (1981) 623-628. doi:10.1016/0021-9614(81)90032-X

T / K = 400.15

P / bar = 1.010

$h^M / J.mol^{-1}$	z_1
34.40	0.3230
35.60	0.3640
36.50	0.4060
38.00	0.4600
37.80	0.5140
36.60	0.5840
33.80	0.6480
32.50	0.6860

Richards, P. - Wormald, C.J. - Yerlett, T.K., The excess enthalpy of (water + nitrogen) vapour and (water + n-heptane) vapour, The Journal of Chemical Thermodynamics. 13 (1981) 623-628. doi:10.1016/0021-9614(81)90032-X

T / K = 410.15

P / bar = 1.010

$h^M / J.mol^{-1}$	z_1
25.20	0.2550
28.50	0.3060
32.00	0.3530
33.10	0.3680
33.80	0.4260
36.30	0.4500
36.00	0.4840
35.20	0.5070
33.60	0.5760

Wormald, C.J - Colling, C.N, Excess enthalpies for (water + nitrogen)(g) up to 698.2 K and 12.6 MPa, The Journal of Chemical Thermodynamics. 15 (1983) 725-737. doi:10.1016/0021-9614(83)90139-8

T / K = 548.20

P / bar = 42.40

$h^M / J.mol^{-1}$	z_1
548.90	0.3020
640.40	0.4010
676.30	0.4990
646.70	0.6000

545.10 0.6980

Wormald, C.J - Colling, C.N, Excess enthalpies for (water + nitrogen)(g) up to 698.2 K and 12.6 MPa, The Journal of Chemical Thermodynamics. 15 (1983) 725-737. doi:10.1016/0021-9614(83)90139-8

T / K = 648.20**P / bar = 100.30** $h^M / \text{J.mol}^{-1}$ z_1

820.80 0.2950

944.00 0.3990

968.50 0.5010

909.60 0.6050

787.50 0.7000

Wormald, C.J - Colling, C.N, Excess enthalpies for (water + nitrogen)(g) up to 698.2 K and 12.6 MPa, The Journal of Chemical Thermodynamics. 15 (1983) 725-737. doi:10.1016/0021-9614(83)90139-8

T / K = 648.20**P / bar = 125.80** $h^M / \text{J.mol}^{-1}$ z_1

1157.0 0.2950

1304.0 0.3970

1315.0 0.5000

1273.0 0.6000

1083.0 0.7000

Wormald, C.J - Colling, C.N, Excess enthalpies for (water + nitrogen)(g) up to 698.2 K and 12.6 MPa, The Journal of Chemical Thermodynamics. 15 (1983) 725-737. doi:10.1016/0021-9614(83)90139-8

T / K = 698.20**P / bar = 104.40** $h^M / \text{J.mol}^{-1}$ z_1

697.10 0.4000

722.00 0.5020

692.50 0.6010

595.80 0.7000

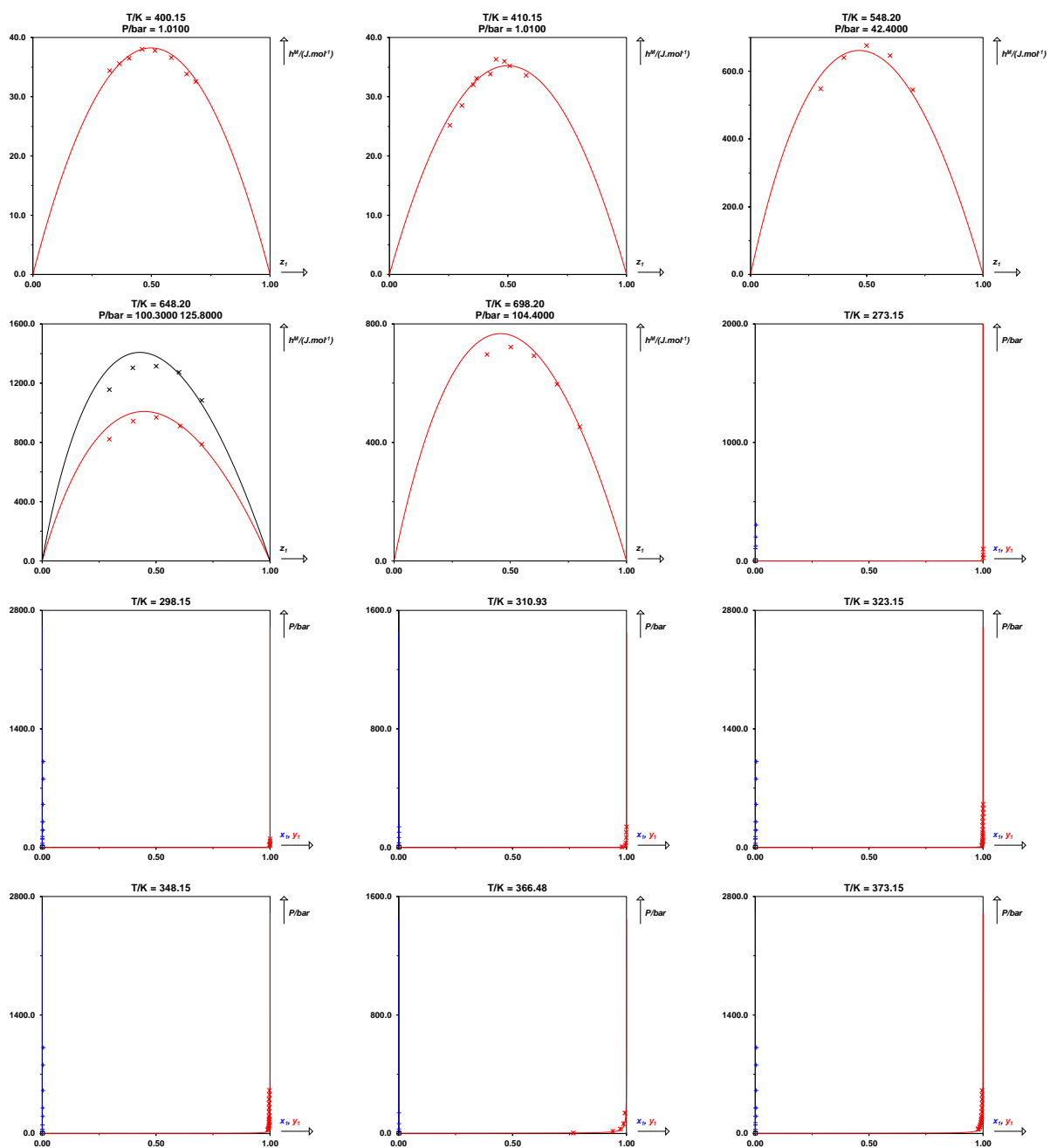
452.50 0.7980

Critical point

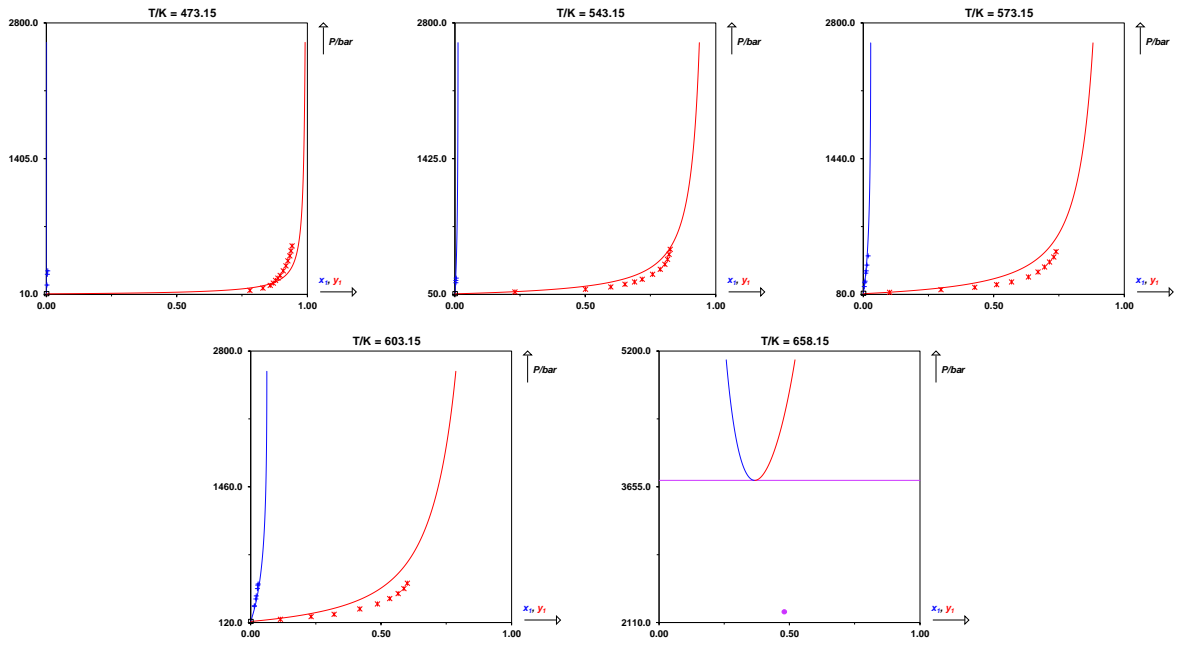
Prokhorova, V.M. - Tsiklis, D.S., Vapor– vapor equilibrium in the system nitrogen– water, Zh. Fiz. Khim. 44 (1970) 2069-2070.

T / K	P / bar	x_1
658.15	2229.2	0.4800

SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



ETHANE (1) + WATER (2)

CAS	74-84-0	7732-18-5
InChiKey	OTMSDBZUPAUEDD-UHFFFAOYSA-N	XLYOFNOQVPJNP-UHFFFAOYSA-N
T_c / K	305.32	647.10
P_c / bar	48.72	220.64
ω	0.099	0.345

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 1001$

$B/\text{MPa} = 962.4$

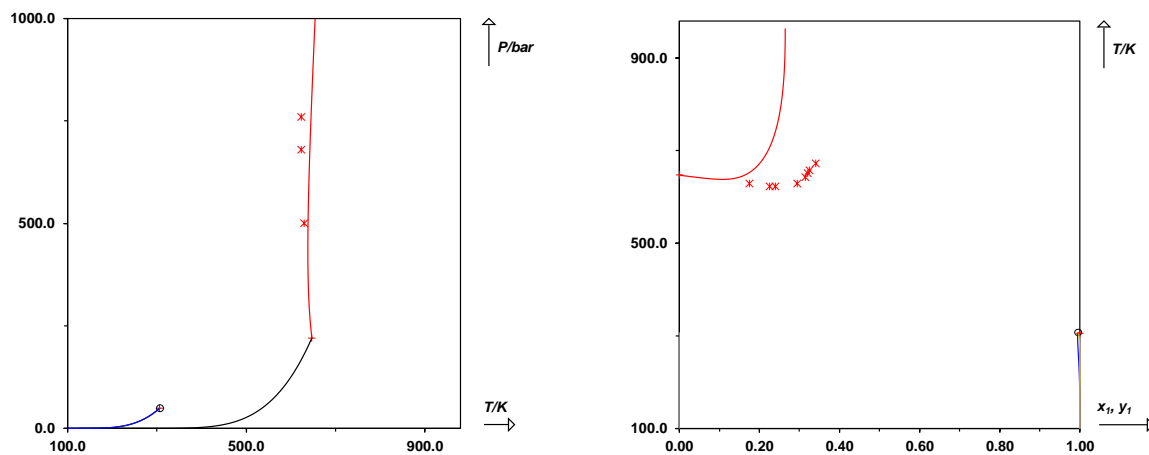
Deviations

MAPE on $x = 24\%$

MAPE on $y = 19\%$

MAPE on $x_c = 65\%$

MAPE on $P_c = 90\%$



Isothermal phase equilibrium data

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen
Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 523.15

P / bar	x ₁	y ₁
200.00	0.0070	0.6900
500.00	0.0100	0.7810
1000.0	0.0125	0.8500
1500.0	0.0150	0.8850

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen
Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 573.15

P / bar	x ₁	y ₁
200.00	0.0100	0.4540
500.00	0.0200	0.5870
1000.0	0.0240	0.7340
1500.0	0.0280	0.8280

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen
Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 623.15

P / bar	x ₁	y ₁	
200.00	0.0090	0.1500	
300.00	0.0350	0.2300	
400.00	0.0650	0.2750	
500.00	0.0990	0.3020	
600.00	0.1430	0.3050	
680.00	0.2250	0.2250	CRIT
760.00	0.2400	0.2400	CRIT
800.00	0.1250	0.3200	
900.00	0.0970	0.4230	
1000.0	0.0850	0.4890	
1500.0	0.0750	0.6780	
2000.0	0.0730	0.7380	
2500.0	0.0720	0.7560	

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen

Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 629.15

P / bar	x ₁	y ₁	
200.00	0.0090	0.1350	
300.00	0.0370	0.2100	
400.00	0.0800	0.2270	
500.00	0.1750	0.1750	CRIT
1205.0	0.2950	0.2950	CRIT
1300.0	0.1170	0.5420	
1400.0	0.1060	0.5920	
1500.0	0.1040	0.6250	
2000.0	0.0970	0.7040	
2500.0	0.0900	0.7300	

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen
Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 643.15

P / bar	x ₁	y ₁	
3500.0	0.0900	0.7220	
3000.0	0.0930	0.7120	
2500.0	0.0960	0.6840	
2000.0	0.1140	0.6190	
1900.0	0.1230	0.5890	
1800.0	0.1350	0.5370	
1700.0	0.2110	0.3670	
1680.0	0.3150	0.3150	CRIT

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen
Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 651.15

P / bar	x ₁	y ₁	
3500.0	0.0960	0.6920	
3000.0	0.0990	0.6900	
2500.0	0.1020	0.6530	
2200.0	0.1180	0.5740	
2100.0	0.1370	0.5160	
2000.0	0.2140	0.3610	
1990.0	0.3200	0.3200	CRIT

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen
Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 658.15

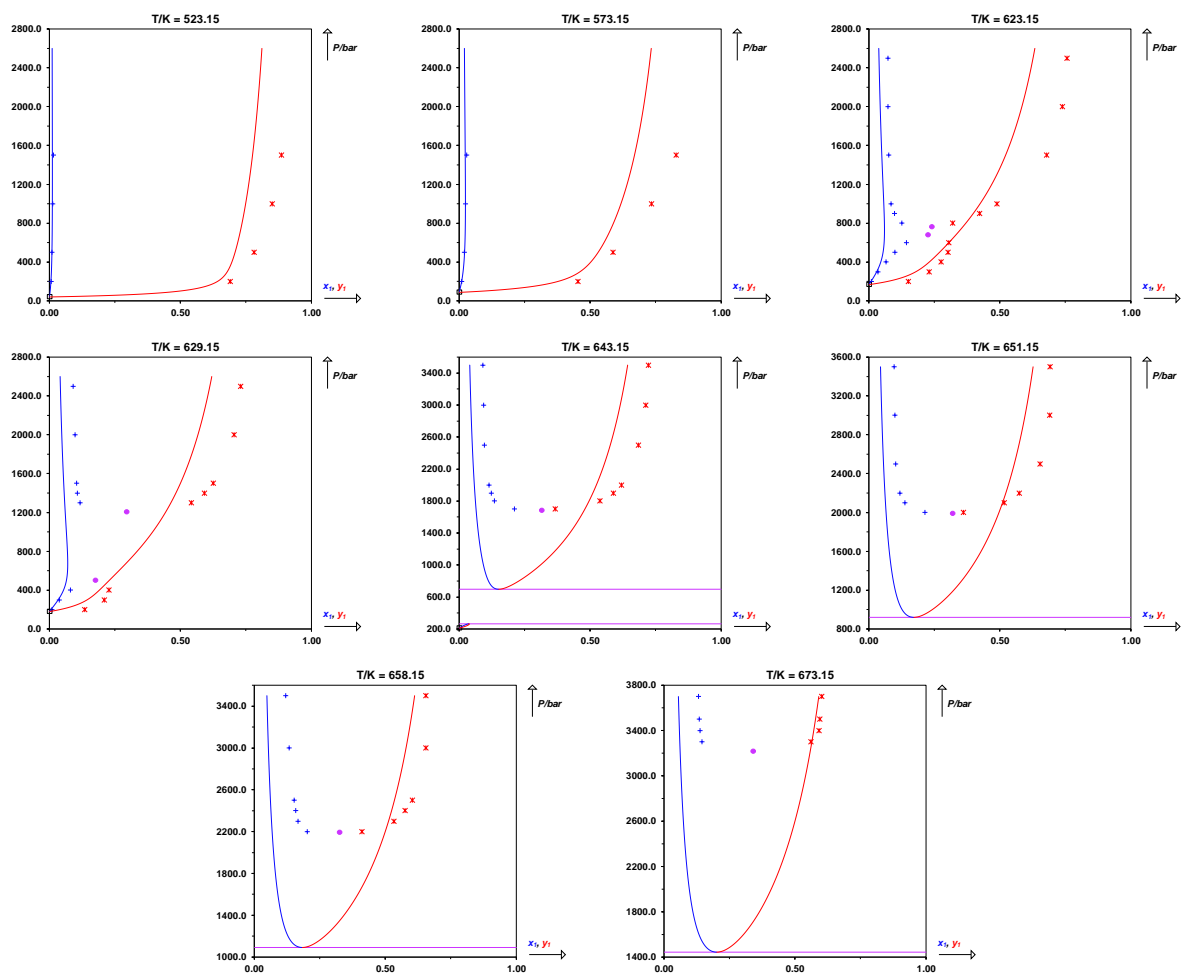
P / bar	x ₁	y ₁	
3500.0	0.1200	0.6550	
3000.0	0.1330	0.6540	
2500.0	0.1520	0.6030	
2400.0	0.1580	0.5750	
2300.0	0.1670	0.5320	
2200.0	0.2020	0.4110	
2190.0	0.3250	0.3250	CRIT

Danneil, A. - Tödheide, K. - Franck, E. U.,
Verdampfungsgleichgewichte und kritische Kurven in den
Systemen Äthan/Wasser und n-Butan/Wasser bei hohen
Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-
822. doi:10.1002/cite.330391309

T / K = 673.15

P / bar	x ₁	y ₁	
3700.0	0.1320	0.6010	
3500.0	0.1350	0.5950	
3400.0	0.1380	0.5910	
3300.0	0.1450	0.5610	
3215.0	0.3400	0.3400	CRIT

SA-NA systems (BAC = 5)



n-BUTANE (1) + WATER (2)

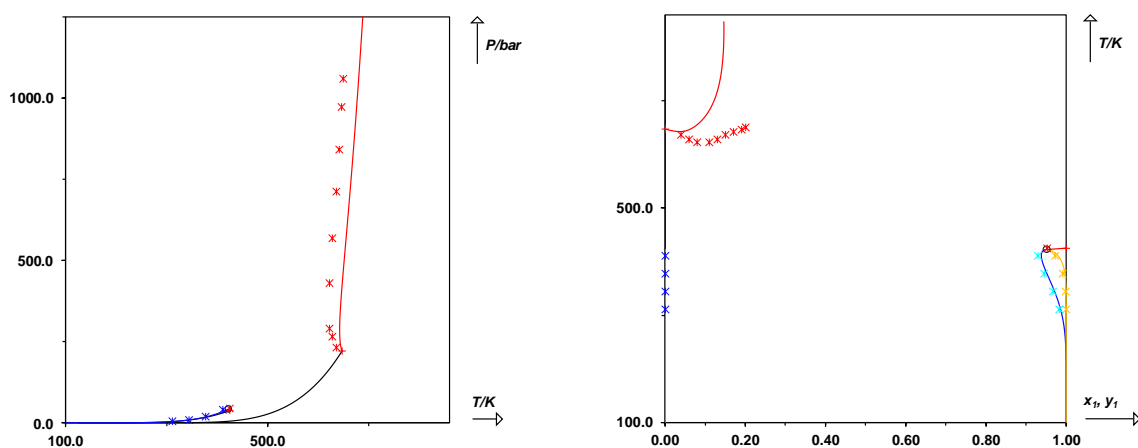
CAS	106-97-8	7732-18-5
InChiKey	IJDNQMDRQITEOD-UHFFFAOYSA-N	XLYOFNOQVPJNP-UHFFFAOYSA-N
T_c / K	425.12	647.10
P_c / bar	37.96	220.64
ω	0.200	0.345

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

A/MPa = 3458

B/MPa = 9119

*Deviations*MAPE on x = 37 %MAPE on y = 5.0 %MAPE on x_c = 52 %MAPE on P_c = 80 %MAPE on z_{LLV} = 30 %MAPE on P_{LLV} = 4.4 %MAPE on h^M = 0.91 %

Isothermal phase equilibrium data

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

T / K = 310.93

P / bar	x ₁	y ₁
1.379	0.000024	0.9535
2.758	0.000048	0.9772

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

T / K = 344.26

P / bar	x ₁	y ₁
1.379	0.000012	0.7650
2.758	0.000029	0.8850
4.137	0.000044	0.9243
5.516	0.000058	0.9443
6.895	0.000071	0.9562

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

T / K = 377.59

P / bar	x ₁	y ₁
1.379	0.000002	0.1420
2.758	0.000017	0.5730
4.137	0.000030	0.7280
5.516	0.000044	0.7910
6.895	0.000057	0.8340
13.79	0.000113	0.9244

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

T / K = 410.93

P / bar	x ₁	y ₁
4.137	0.000008	0.1800
5.516	0.000021	0.3860
6.895	0.000035	0.5090
13.79	0.000096	0.7610
20.68	0.000148	0.8520
27.58	0.000191	0.9009

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the

Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

T / K = 444.26

P / bar	x ₁	y ₁
13.79	0.000074	0.4060
20.68	0.000151	0.6090
27.58	0.000219	0.7250
34.47	0.000279	0.8020
41.37	0.000322	0.8580
55.16	0.000368	0.9184
68.95	0.000386	0.9382
86.18	0.000400	0.9455
103.42	0.000409	0.9503
120.66	0.000417	0.9539
137.90	0.000423	0.9567
172.37	0.000434	0.9603
206.84	0.000443	0.9631
275.79	0.000463	0.9667
344.74	0.000476	0.9601
413.69	0.000487	0.9713
482.63	0.000499	0.9734
551.58	0.000509	0.9752
620.53	0.000518	0.9767
689.48	0.000528	0.9779

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

T / K = 477.59

P / bar	x ₁	y ₁
20.68	0.000065	0.1690
27.58	0.000175	0.3650
34.47	0.000270	0.4880
41.37	0.000355	0.5770
55.16	0.000488	0.6970
68.95	0.000569	0.7750
86.18	0.000637	0.8320
103.42	0.000677	0.8600
120.66	0.000709	0.8770
137.90	0.000736	0.8900
172.37	0.000777	0.9052
206.84	0.000810	0.9150
275.79	0.000855	0.9264
344.74	0.000891	0.9335
413.69	0.000920	0.9390
482.63	0.000946	0.9421
551.58	0.000966	0.9453
620.53	0.000985	0.9481
689.48	0.001002	0.9503

Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

T / K =	510.93	
P / bar	x ₁	y ₁
34.47	0.000078	0.0560
41.37	0.000288	0.1890
55.16	0.000600	0.3770
68.95	0.000792	0.5070
86.18	0.000973	0.6180
103.42	0.001089	0.6890
120.66	0.001150	0.7320
137.90	0.001195	0.7620
172.37	0.001265	0.7980
206.84	0.001325	0.8210
275.79	0.001420	0.8500
344.74	0.001498	0.8650
413.69	0.001556	0.8740
482.63	0.001603	0.8800
551.58	0.001643	0.8850
620.53	0.001679	0.8890
689.48	0.001711	0.8920

Danneil, A. - Tödheide, K. - Franck, E. U., Verdampfungsgleichgewichte und kritische Kurven in den Systemen Äthan/Wasser und n-Butan/Wasser bei hohen Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-822. doi:10.1002/cite.330391309

T / K =	628.15	
P / bar	x ₁	y ₁
255.00	0.0250	0.1240
295.00	0.0480	0.1050
590.00	0.0430	0.2870

Danneil, A. - Tödheide, K. - Franck, E. U., Verdampfungsgleichgewichte und kritische Kurven in den Systemen Äthan/Wasser und n-Butan/Wasser bei hohen Drücken, Chemie Ingenieur Technik - CIT. 39 (1967) 816-822. doi:10.1002/cite.330391309

T / K =	637.15	
P / bar	x ₁	y ₁
690.00	0.0770	0.2560
830.00	0.0410	0.3180

Enthalpy of mixing

Lancaster, N.M - Wormald, C.J, Excess molar enthalpies for {xH₂O + (1 - x)C₃H₆}(g), {xH₂O + (1 - x)C₃H₈}(g), and {xH₂O + (1 - x)C₄H₁₀}(g), The Journal of Chemical

Thermodynamics. 18 (1986) 545-550. doi:10.1016/0021-9614(86)90137-0

T / K =	393.20	
P / bar =	1.010	
h ^M / J.mol ⁻¹	z ₁	
54.30	0.3180	
56.40	0.3610	
57.40	0.3990	
60.20	0.4310	
61.00	0.4580	
61.60	0.4950	
61.50	0.5410	
60.20	0.5660	
58.50	0.6350	
51.60	0.7020	

Critical point

Reamer, H. H. - Olds, R. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in Three-Phase Region, Industrial & Engineering Chemistry. 36 (1944) 381-383. doi:10.1021/ie50412a024

T / K	P / bar	x ₁
425.15	43.95	0.9517

Tian, Yiling - Zhao, Xuefeng - Chen, Li - Zhu, Hugang - Fu, Huafeng, High pressure phase equilibria and critical phenomena of water + iso-butane and water + n-butane systems to 695 K and 306 MPa, The Journal of Supercritical Fluids. 30 (2004) 145-153. doi:10.1016/j.supflu.2003.09.002

T / K	P / bar	x ₁
622.00	430.00	0.1100
622.00	290.00	0.0800
628.00	569.00	0.1300
628.00	265.00	0.0600
636.00	711.00	0.1500
636.00	232.00	0.0400
642.00	842.00	0.1700
646.00	972.00	0.1900
650.00	1060.0	0.2000

Three-phase line

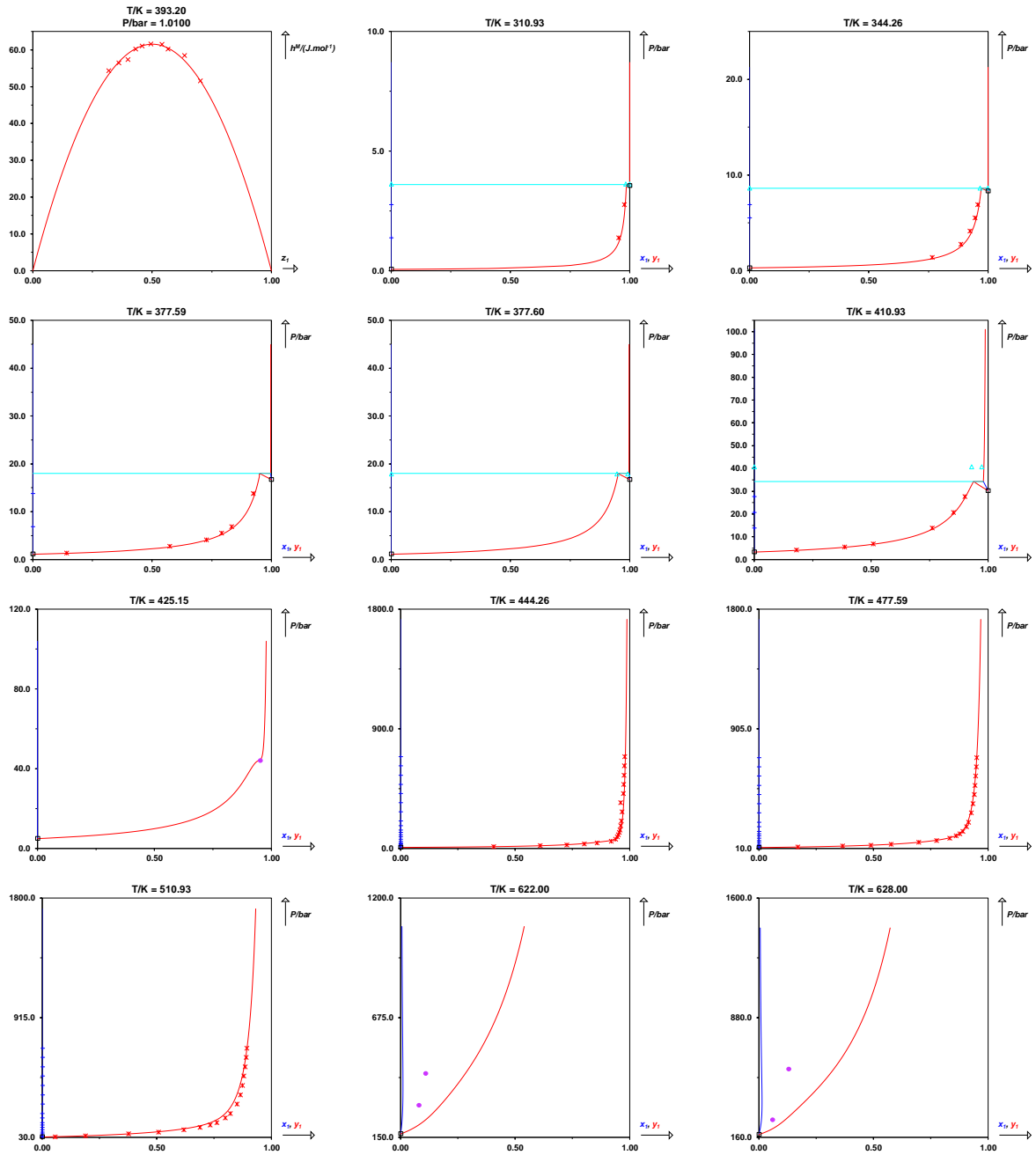
Reamer, H. H. - Sage, B. H. - Lacey, W. N., Phase Equilibria in Hydrocarbon Systems. n-Butane-Water System in the Two-Phase Region., Industrial & Engineering Chemistry. 44 (1952) 609-615. doi:10.1021/ie50507a049

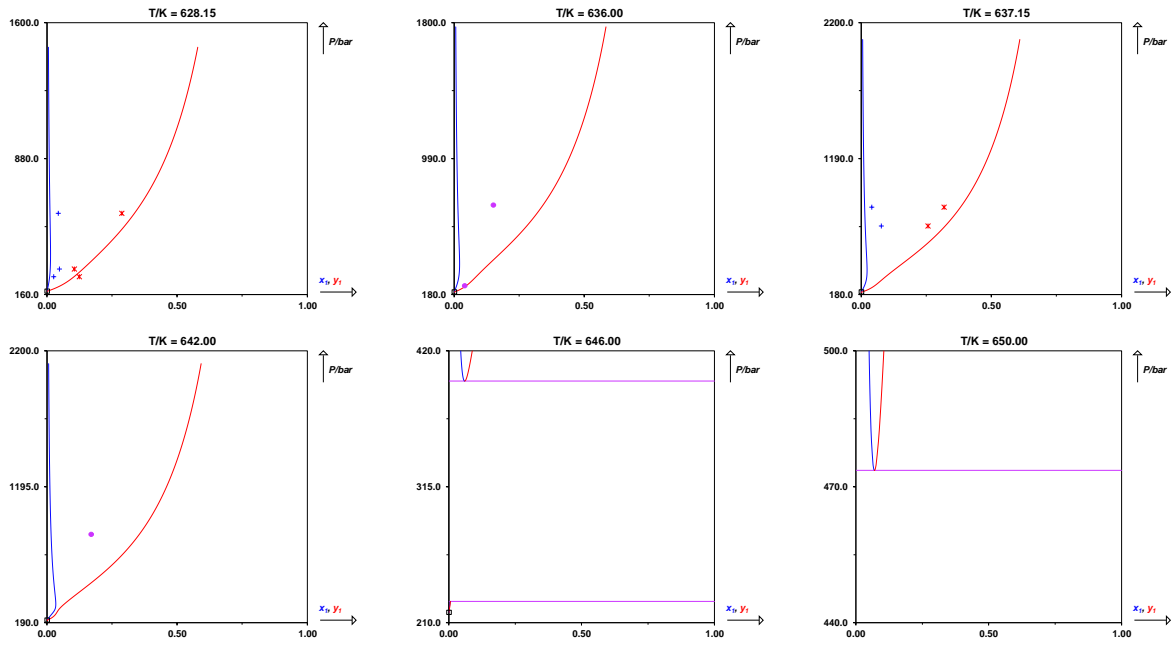
T / K	P / bar	x ₁ ^a	x ₁ ^b	y ₁
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SA-NA systems (BAC = 5)

310.93	3.616	0.0001	0.9995	0.9833
344.26	8.646	0.0001	0.9979	0.9662
377.60	17.88	0.0001	0.9915	0.9459
410.93	40.74	0.0002	0.9732	0.9292

SA-NA systems (BAC = 5)





WATER (1) + BENZENE (2)

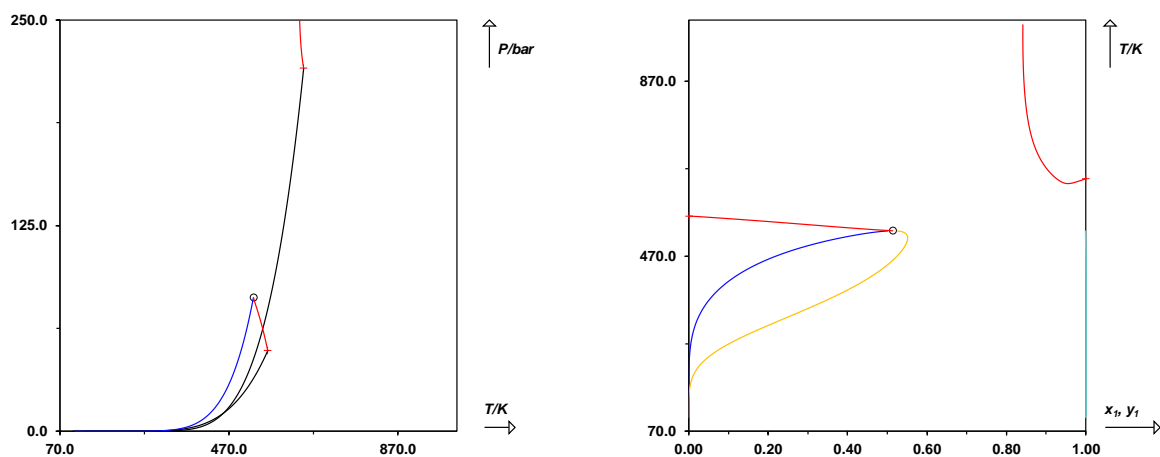
CAS	7732-18-5	71-43-2
InChiKey	XLYOFNOQVPJNP-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	647.10	562.05
P_c / bar	220.64	48.95
ω	0.345	0.210

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

A/MPa = 1203

B/MPa = 1512

*Deviations*MAPE on x = 33 %MAPE on y = 19 %MAPE on h^M = 23 %

Isothermal phase equilibrium data

Bader, M. S. H. - Gasem, K. A. M., DETERMINATION OF INFINITE DILUTION ACTIVITY COEFFICIENTS FOR ORGANIC-AQUEOUS SYSTEMS USING A DILUTE VAPOR-LIQUID EQUILIBRIUM METHOD, Chemical Engineering Communications. 140 (1995) 41-72. doi:10.1080/00986449608936454

T / K = 298.15

P / bar	x_1	y_1
0.0408	0.999981	0.8265
0.0421	0.999975	0.7771
0.0422	0.999974	0.7681
0.0533	0.999948	0.6425
0.0561	0.999937	0.5968
0.0699	0.999902	0.4971
0.0815	0.999870	0.4419
0.0829	0.999863	0.4304
0.0828	0.999862	0.4200
0.0887	0.999838	0.3815
0.0940	0.999822	0.3688
0.1029	0.999786	0.3211
0.1101	0.999748	0.2673
0.1137	0.999731	0.2623

Isobaric phase equilibrium data

Tu, M - Lai, G - Fei, D, Phase equilibrium for the system of phosphoric acid-water-benzene, J. Chengdu Univ. Sci. Technol. 3 (1982) 65-70.

P / bar = 1.013

T / K	x_1	y_1
350.87	0.0095	0.0690
348.99	0.0129	0.1115
347.80	0.0125	0.1436
345.99	0.0167	0.1827
345.17	0.0297	0.2335
343.45	0.2145	0.2976
342.42	0.9720	0.2962
342.42	0.9832	0.2998
342.80	0.9801	0.3140
342.43	0.9913	0.3172
344.88	0.9893	0.3779
346.74	0.9875	0.3902
348.65	0.9877	0.5030
351.50	0.9931	0.5194
355.15	0.9917	0.5866
357.10	0.9877	0.6424
362.35	0.9893	0.7389

365.35	0.9996	0.7680
367.65	0.9933	0.8148
370.90	0.9980	0.8788

Thompson, W. H. - Snyder, J. R., Mutual Solubilities of Benzene and Water. Equilibria in the Two Phase Liquid - Liquid Region., Journal of Chemical & Engineering Data. 9 (1964) 516-520. doi:10.1021/jc60023a013

P / bar = 68.95

T / K	x_1^a	x_1^b
310.93	0.999554	0.00423
310.98	0.999546	0.00466
311.09	0.999566	0.00487
311.48	0.999540	0.00420
344.26	0.999335	0.01210
344.43	0.999337	0.01240
410.93	0.998140	0.05580
444.26	0.996400	0.10000
477.59	0.991800	0.17800

Thompson, W. H. - Snyder, J. R., Mutual Solubilities of Benzene and Water. Equilibria in the Two Phase Liquid - Liquid Region., Journal of Chemical & Engineering Data. 9 (1964) 516-520. doi:10.1021/jc60023a013

P / bar = 344.74

T / K	x_1^a	x_1^b
344.26	0.999095	0.0106
377.98	0.999337	0.0124
443.87	0.995690	0.0959
444.26	0.995700	0.0905
477.59	0.990200	0.1620
477.98	0.990170	0.1530
511.32	0.973500	0.4320
510.93	0.974500	0.4500
510.76	0.975200	0.4600

Enthalpy of mixing

Wormald, C. J. - Lancaster, N. M. - Sowden, C. J., Benzene-water association Excess molar enthalpy and second virial cross-coefficients for (benzene-water)(g) and (cyclohexane-water)(g), Journal of the Chemical Society, Faraday Transactions. 93 (1997) 1921-1926. doi:10.1039/a608259i

T / K = 403.20
P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1
62.00	0.6180
65.20	0.5570
65.40	0.4940
64.50	0.4530

SA-NA systems (BAC = 5)

63.60	0.3990	$h^M / J.mol^{-1}$	z_1
		355.00	0.9870
Wormald, C. J. - Lancaster, N. M. - Sowden, C. J., Benzene–water association Excess molar enthalpy and second virial cross-coefficients for (benzene–water)(g) and (cyclohexane–water)(g), Journal of the Chemical Society, Faraday Transactions. 93 (1997) 1921-1926. doi:10.1039/a608259i		587.00	0.9720
		1012.0	0.9380
		1465.0	0.8940
		2047.0	0.8340
		2358.0	0.7970
T / K = 413.20		2772.0	0.7520
P / bar = 1.010		3260.0	0.6980
$h^M / J.mol^{-1}$	z_1	3438.0	0.6650
57.00	0.6350	3843.0	0.6200
58.30	0.5910	4199.0	0.5870
59.70	0.5040	4566.0	0.5390
60.80	0.4480	5064.0	0.4830
57.10	0.4200	5602.0	0.4200
		6160.0	0.3600
Wormald, C.J. - Slater, J., Excess enthalpies for (water + benzene) in the liquid and supercritical regions at T= 503 K to T= 592 K and p= 16.4 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 627-636. doi:10.1006/jcht.1996.0059		6156.0	0.3440
		5981.0	0.3280
		5006.0	0.2540
T / K = 503.00		Wormald, C.J. - Slater, J., Excess enthalpies for (water + benzene) in the liquid and supercritical regions at T= 503 K to T= 592 K and p= 16.4 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 627-636. doi:10.1006/jcht.1996.0059	
P / bar = 164.00			
$h^M / J.mol^{-1}$	z_1	T / K = 544.00	
395.00	0.9720	P / bar = 164.00	
692.00	0.9380	$h^M / J.mol^{-1}$	z_1
1020.0	0.8930	927.00	0.9730
1434.0	0.8340	606.00	0.9690
1681.0	0.7970	1566.0	0.9400
1967.0	0.7500	2271.0	0.8950
2294.0	0.6960	3049.0	0.8370
2473.0	0.6630	3584.0	0.7990
2707.0	0.6270	4207.0	0.7550
2971.0	0.5850	4929.0	0.7000
3250.0	0.5370	5475.0	0.6670
3575.0	0.4840	5832.0	0.6310
3959.0	0.4180	6445.0	0.5890
4294.0	0.3610	7037.0	0.5420
4520.0	0.3260	7656.0	0.5070
4724.0	0.2900	7785.0	0.4840
4858.0	0.2710	7636.0	0.4610
4709.0	0.2520	7426.0	0.4200
4194.0	0.2100	6453.0	0.3280
Wormald, C.J. - Slater, J., Excess enthalpies for (water + benzene) in the liquid and supercritical regions at T= 503 K to T= 592 K and p= 16.4 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 627-636. doi:10.1006/jcht.1996.0059		5410.0	0.2530
T / K = 521.00		Wormald, C.J. - Slater, J., Excess enthalpies for (water + benzene) in the liquid and supercritical regions at T= 503 K to T= 592 K and p= 16.4 MPa, The Journal of Chemical	
P / bar = 164.00			

Thermodynamics.		28	(1996)	627-636.	$h^M / \text{J.mol}^{-1}$	z_1
doi:10.1006/jcht.1996.0059					1413.0	0.9730
T / K =	560.00				2932.0	0.9390
P / bar =	164.00				4626.0	0.8960
$h^M / \text{J.mol}^{-1}$	z_1				6594.0	0.8370
2349.0	0.9390				7771.0	0.8000
3302.0	0.8950				9192.0	0.7540
4482.0	0.8370				10315.0	0.7000
5297.0	0.7990				10458.0	0.6990
6243.0	0.7550				10998.0	0.6310
7233.0	0.7010				11162.0	0.5900
8556.0	0.6280				10846.0	0.5420
8803.0	0.5890				10097.0	0.4870
8727.0	0.5370				9229.0	0.4230
8067.0	0.4180				7637.0	0.3300
6899.0	0.3300				6165.0	0.2560
5694.0	0.2520					

Wormald, C.J. - Slater, J., Excess enthalpies for (water + benzene) in the liquid and supercritical regions at T= 503 K to T= 592 K and p= 16.4 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 627-636. doi:10.1006/jcht.1996.0059

T / K = 576.00

P / bar = 164.00

$h^M / \text{J.mol}^{-1}$ z_1

2407.0 0.9490

4244.0 0.9000

5627.0 0.8520

5947.0 0.8390

7167.0 0.8010

8073.0 0.7580

9199.0 0.7040

9779.0 0.6680

10132.0 0.6370

10060.0 0.6360

10175.0 0.6000

9971.0 0.5390

9599.0 0.4860

8869.0 0.4290

8958.0 0.4270

7676.0 0.3470

6009.0 0.2570

Wormald, C.J. - Slater, J., Excess enthalpies for (water + benzene) in the liquid and supercritical regions at T= 503 K to T= 592 K and p= 16.4 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 627-636. doi:10.1006/jcht.1996.0059

T / K = 581.00

P / bar = 164.00

Wormald, C.J. - Slater, J., Excess enthalpies for (water + benzene) in the liquid and supercritical regions at T= 503 K to T= 592 K and p= 16.4 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 627-636. doi:10.1006/jcht.1996.0059

T / K = 592.00

P / bar = 164.00

$h^M / \text{J.mol}^{-1}$ z_1

1674.0 0.9730

3400.0 0.9390

3728.0 0.9310

4314.0 0.9190

5651.0 0.8950

6546.0 0.8800

6923.0 0.8680

7791.0 0.8590

8039.0 0.8500

8315.0 0.8430

8764.0 0.8370

9506.0 0.8300

9732.0 0.8230

10136.0 0.8150

10754.0 0.8080

11313.0 0.7960

12791.0 0.7550

13589.0 0.7230

13680.0 0.6990

13180.0 0.6300

12758.0 0.5890

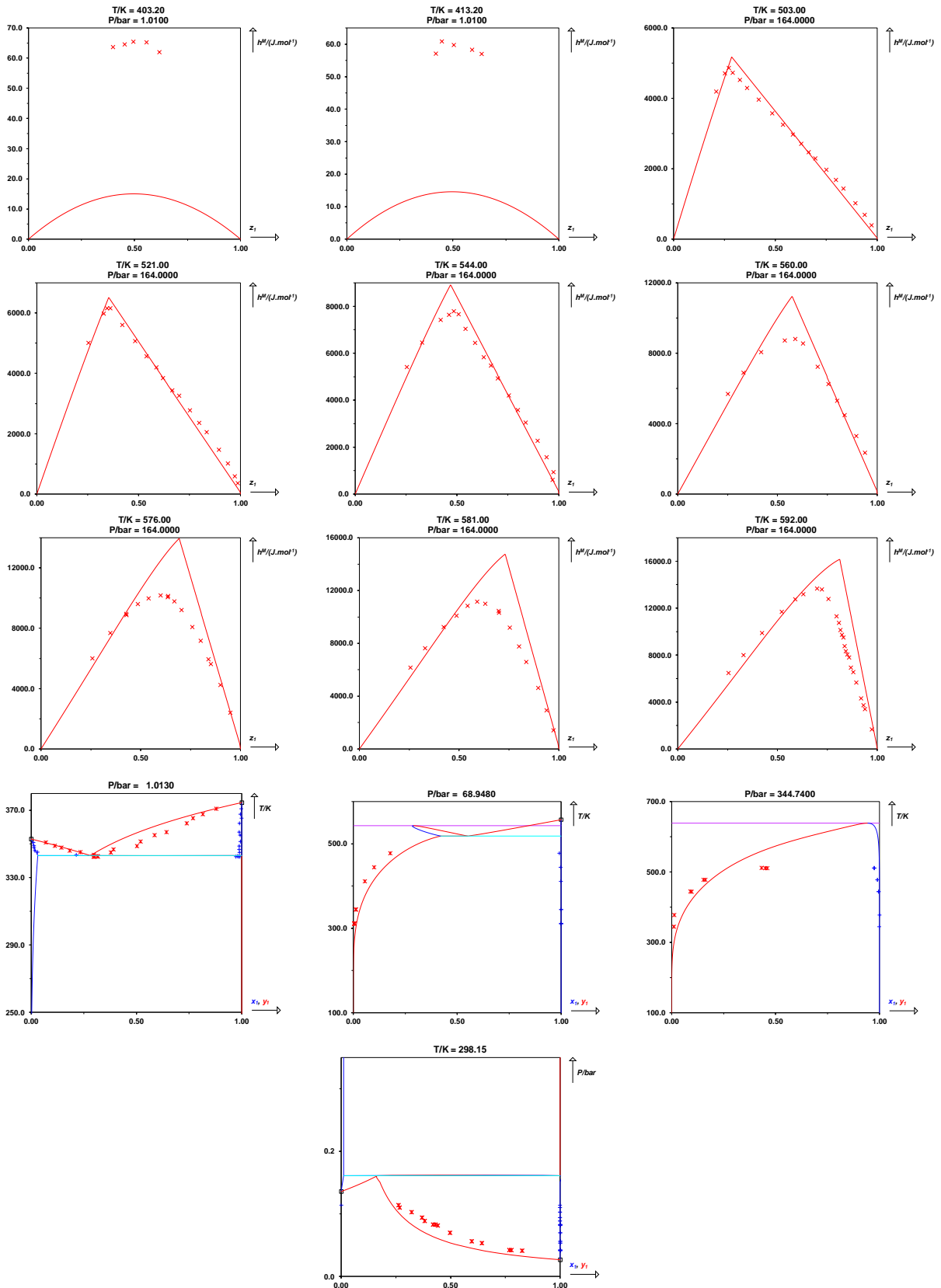
11697.0 0.5210

9890.0 0.4220

8007.0 0.3290

6478.0 0.2550

SA-NA systems (BAC = 5)



ETHANE (1) + METHANOL (2)

CAS	74-84-0	67-56-1
InChiKey	OTMSDBZUPAUEDD-UHFFFAOYSA-N	OKKJLVBELUTLKV-UHFFFAOYSA-N
T_c / K	305.32	512.50
P_c / bar	48.72	80.84
ω	0.099	0.566

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 401.5$$

$$B/\text{MPa} = -142.2$$

Deviations

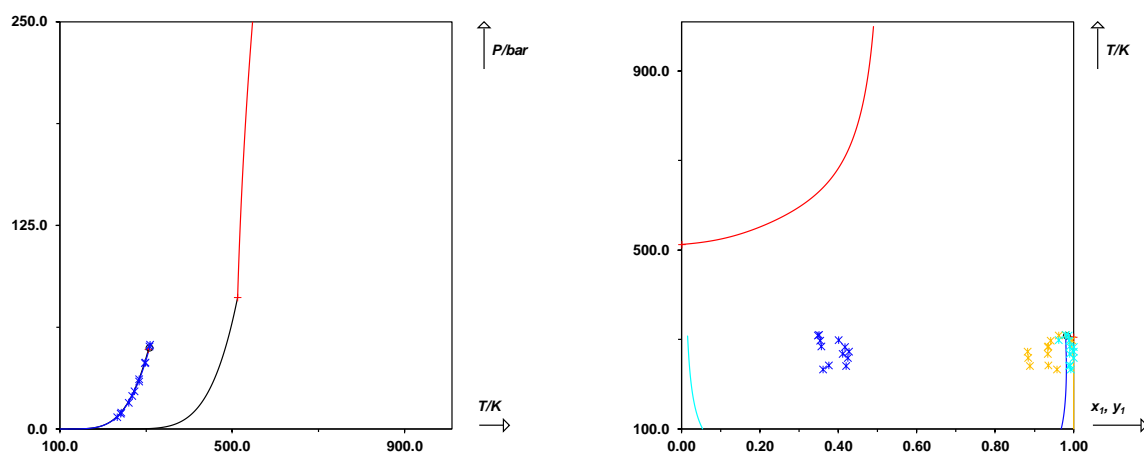
$$\text{MAPE on } x = 56\%$$

$$\text{MAPE on } y = 20\%$$

$$\text{MAPE on } x_{\text{LLV}} = 125\%$$

$$\text{MAPE on } P_{\text{LLV}} = 1.7\%$$

$$\text{MAPE on } h^{\text{M}} = 55\%$$



Isothermal phase equilibrium data

Ruffine, L., Équilibres de phases à basse température de systèmes complexes CO₂ - hydrocarbures légers - méthanol - eau : mesures et modélisation (2005)

T / K = 241.40

P / bar	x ₁	y ₁
1.700	0.0346	0.9917
3.160	0.0582	0.9998
6.260	0.1348	0.9999
9.320	0.3267	0.9996

Ruffine, L., Équilibres de phases à basse température de systèmes complexes CO₂ - hydrocarbures légers - méthanol - eau : mesures et modélisation (2005)

T / K = 241.40

P / bar	x ₁
2.380	0.0438
4.700	0.0972
6.510	0.1536
7.570	0.2010
8.500	0.2427
9.380	0.4234
9.400	0.4202
9.420	0.4442

Ruffine, L. - Barreau, A. - Brunella, I. - Mougin, P. - Jose, J., New Apparatus for Low-Temperature Investigations: Measurements of the Multiphase Equilibrium of Mixtures Containing Methane, Ethane, Propane, Butane, Methanol, and Carbon Dioxide, *Industrial & Engineering Chemistry Research*. 44 (2005) 8387-8392. doi:10.1021/ie0506365

T / K = 273.15

P / bar	x ₁ ^a	x ₁ ^β	y ₁
1.740	0.0202	-	-
7.020	0.0688	-	-
8.240	0.0855	-	-
8.310	0.0813	-	-
11.11	0.1105	-	-
15.17	0.1705	-	-
16.22	0.1957	-	-
16.84	0.2013	-	-
19.90	0.2603	-	-
23.23	0.3838	-	-
23.26	0.4269	0.8829	0.9998 3PL

Ohgaki, Kazunari - Sano, Fumihiko - Katayama, Takashi, Isothermal vapor-liquid equilibrium data for binary systems containing ethane at high pressures, *Journal of*

Chemical & Engineering Data. 21 (1976) 55-58. doi:10.1021/je60068a016

T / K = 298.15

P / bar	x ₁	y ₁
10.94	0.0403	0.9822
21.02	0.0880	0.9887
31.43	0.1755	0.9914
38.56	0.2728	0.9921
41.25	0.3511	0.9922

Ishihara, Katsuo - Tanaka, Hiroyuki - Kato, Masahiro, Phase equilibrium properties of ethane+methanol system at 298.15 K, *Fluid Phase Equilibria*. 144 (1998) 131-136. doi:10.1016/S0378-3812(97)00251-3

T / K = 298.15

P / bar	x ₁ ^a	x ₁ ^β	y ₁
9.630	0.0530	-	0.9590
20.58	0.1130	-	0.9780
30.61	0.1990	-	0.9860
34.10	0.2410	-	0.9910
39.40	0.3440	-	0.9950
40.91	0.4000	0.9620	0.9950 3PL
41.33	-	0.9720	0.9970
41.55	-	0.9880	0.9980
48.59	0.4230	0.9410	-
67.69	0.4830	0.8890	-

Ma, Yi Hua. - Kohn, James P., Multiphase and Volumetric Equilibria of the Ethane-Methanol System at Temperatures between -40° and 100°C., *Journal of Chemical & Engineering Data*. 9 (1964) 3-5. doi:10.1021/je60020a002

T / K = 323.15

P / bar	x ₁	y ₁
20.26	0.0619	0.9070
30.39	0.0990	0.9430
40.52	0.1454	0.9600
50.65	0.2045	0.9700
60.78	0.2753	0.9780

Ma, Yi Hua. - Kohn, James P., Multiphase and Volumetric Equilibria of the Ethane-Methanol System at Temperatures between -40° and 100°C., *Journal of Chemical & Engineering Data*. 9 (1964) 3-5. doi:10.1021/je60020a002

T / K = 348.15

P / bar	x ₁	y ₁
20.26	0.0433	0.8550
30.39	0.0718	0.8970
40.52	0.1015	0.9260
50.65	0.1332	0.9440
60.78	0.1738	0.9490

			117.61	0.8784
Ma, Yi Hua. - Kohn, James P., Multiphase and Volumetric Equilibria of the Ethane-Methanol System at Temperatures between -40° and 100°C., Journal of Chemical & Engineering Data. 9 (1964) 3-5. doi:10.1021/je60020a002			129.39	0.9075
T / K =	373.15		138.46	0.9374
P / bar	x ₁	y ₁	138.37	0.9682
20.26	0.0284	0.6870	137.16	0.9731
30.39	0.0510	0.7560	134.70	0.9745
40.52	0.0719	0.8080		
50.65	0.0967	0.8420	McFall, T.A. - Post, M.E. - Christensen, J.J. - Izatt, R.M., The excess enthalpies of eight (ethane + alcohol) mixtures at 298.15 K, The Journal of Chemical Thermodynamics. 13 (1981) 441-446. doi:10.1016/0021-9614(81)90051-3	
60.78	0.1290	0.8640	T / K =	298.15
-----			P / bar =	69.00
Enthalpy of mixing			h ^M / J.mol ⁻¹	z ₁
-----			4.170	0.0099
Sipowska, J.T - Graham, R.C - Neely, B.J - Ott, J.B - Izatt, R.M, Excess enthalpies for (ethane + methanol) at 298.15 and 348.15 K and 7.5 and 15 MPa, and at 323.15 K at 7.5, 10, and 15 MPa, The Journal of Chemical Thermodynamics. 21 (1989) 1085-1093. doi:10.1016/0021-9614(89)90095-5			12.29	0.0410
T / K =	298.15		18.76	0.0740
P / bar =	75.00		22.14	0.1093
h ^M / J.mol ⁻¹	z ₁		23.40	0.1471
8.760	0.0265		19.89	0.1877
16.52	0.0542		16.14	0.2313
21.58	0.0835		7.030	0.2784
26.72	0.1143		1.010	0.3293
29.23	0.1468		-4.650	0.3846
28.46	0.1812		-6.970	0.4141
26.68	0.2175		-5.180	0.4448
23.45	0.2560		-1.850	0.4770
19.30	0.2970		4.870	0.5106
13.70	0.3405		14.21	0.5459
8.500	0.3869		25.44	0.5829
6.570	0.4195		35.90	0.6218
9.210	0.4607		43.43	0.6626
14.63	0.4895		56.08	0.7057
20.32	0.5155		67.33	0.7510
27.55	0.5464		71.22	0.7667
32.96	0.5744		80.19	0.7989
44.59	0.6076		88.70	0.8324
48.33	0.6378		93.98	0.8496
59.17	0.6737		111.35	0.8850
65.62	0.7064		117.56	0.9032
79.14	0.7452		127.45	0.9218
85.40	0.7807		134.39	0.9408
96.78	0.8229		136.17	0.9601
101.32	0.8503		131.89	0.9798
			Sipowska, J.T - Graham, R.C - Neely, B.J - Ott, J.B - Izatt, R.M, Excess enthalpies for (ethane + methanol) at 298.15 and 348.15 K and 7.5 and 15 MPa, and at 323.15 K at 7.5, 10, and 15 MPa, The Journal of Chemical Thermodynamics. 21 (1989) 1085-1093. doi:10.1016/0021-9614(89)90095-5	

SA-NA systems (BAC = 5)

T / K =	323.15	-96.30	0.4895
P / bar =	100.00	155.40	0.6076
$h^M / \text{J.mol}^{-1}$	z_1	301.70	0.6737
6.400	0.0560	443.40	0.7452
8.100	0.0861	514.50	0.7807
6.900	0.1177	620.10	0.8229
5.000	0.1511	688.90	0.8614
0.7000	0.1862	791.60	0.9075
-4.900	0.2233	858.20	0.9374
-13.30	0.2625	866.50	0.9435
-18.10	0.3040	885.50	0.9496
-19.50	0.3480	901.10	0.9558
-20.20	0.3948	831.10	0.9620
-17.00	0.4447	753.10	0.9682
8.700	0.4978		
41.40	0.5547		
72.90	0.6156		
112.10	0.6810		
155.50	0.7515		
196.90	0.8277		
231.80	0.8654		
275.40	0.9103		
292.70	0.9393		
292.60	0.9512		
263.20	0.9768		

Sipowska, J.T - Graham, R.C - Neely, B.J - Ott, J.B - Izatt, R.M, Excess enthalpies for (ethane + methanol) at 298.15 and 348.15 K and 7.5 and 15 MPa, and at 323.15 K at 7.5, 10, and 15 MPa, The Journal of Chemical Thermodynamics. 21 (1989) 1085-1093. doi:10.1016/0021-9614(89)90095-5

T / K = 348.15

P / bar = 75.00

$h^M / \text{J.mol}^{-1}$ z_1

-20.00	0.0087
-44.70	0.0175
-69.00	0.0265
-152.80	0.0542
-235.40	0.0835
-325.10	0.1143
-422.80	0.1468
-530.70	0.1812
-635.30	0.2175
-650.40	0.2301
-597.10	0.2560
-508.80	0.2969
-417.20	0.3404
-316.20	0.3869
-209.10	0.4364

Three-phase line

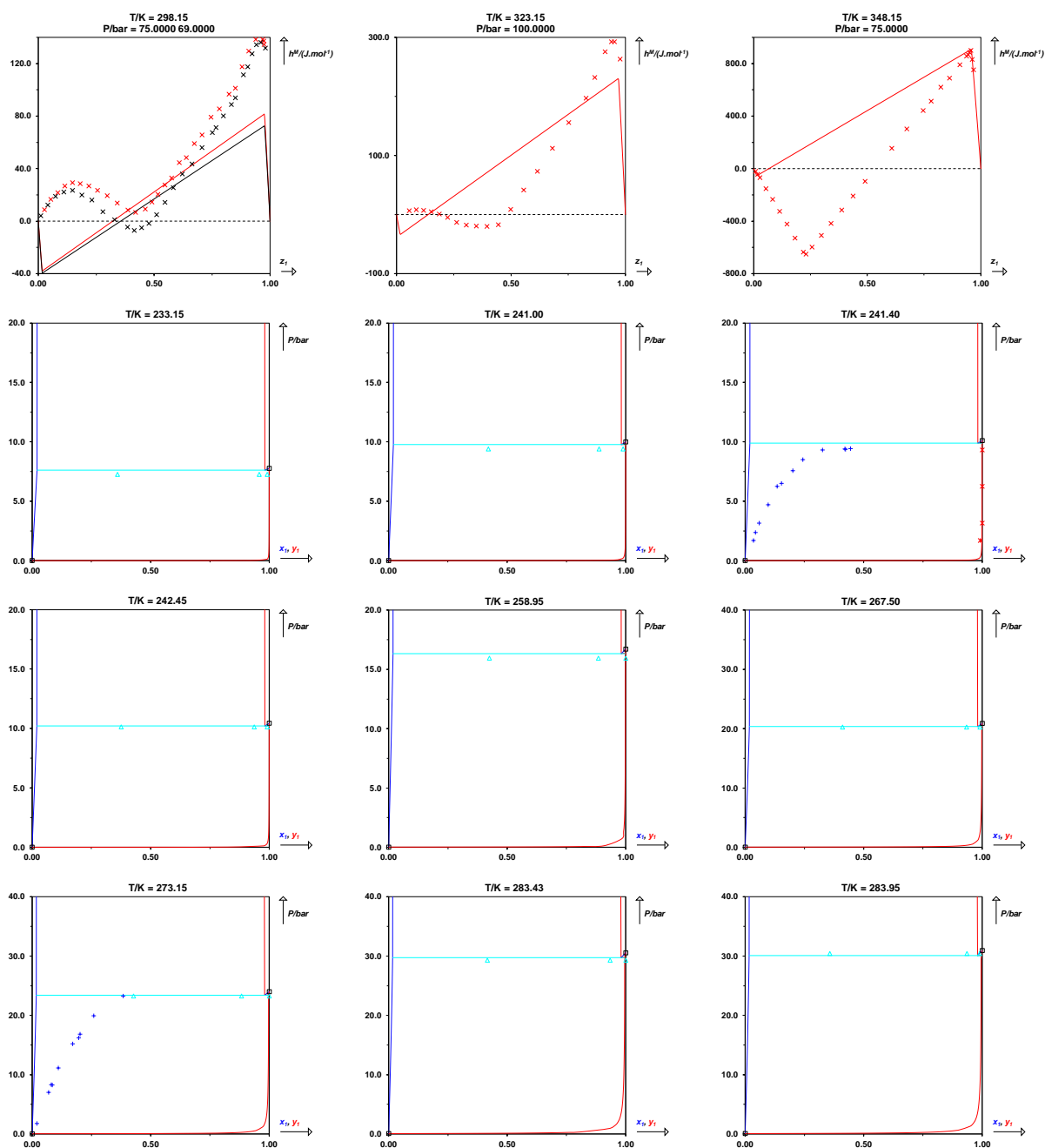
Ma, Yi Hua. - Kohn, James P., Multiphase and Volumetric Equilibria of the Ethane-Methanol System at Temperatures between -40° and 100°C., Journal of Chemical & Engineering Data. 9 (1964) 3-5. doi:10.1021/je60020a002

T / K	P / bar	x_1^a	x_1^b	y_1
233.15	7.275	0.3600	0.9570	0.9920
242.45	10.13	0.3760	0.9360	0.9910
267.50	20.27	0.4100	0.9340	0.9900
283.95	30.40	0.3570	0.9360	0.9890
296.93	40.53	0.3540	0.9410	0.9880
308.40	50.66	0.3480	0.9620	0.9860

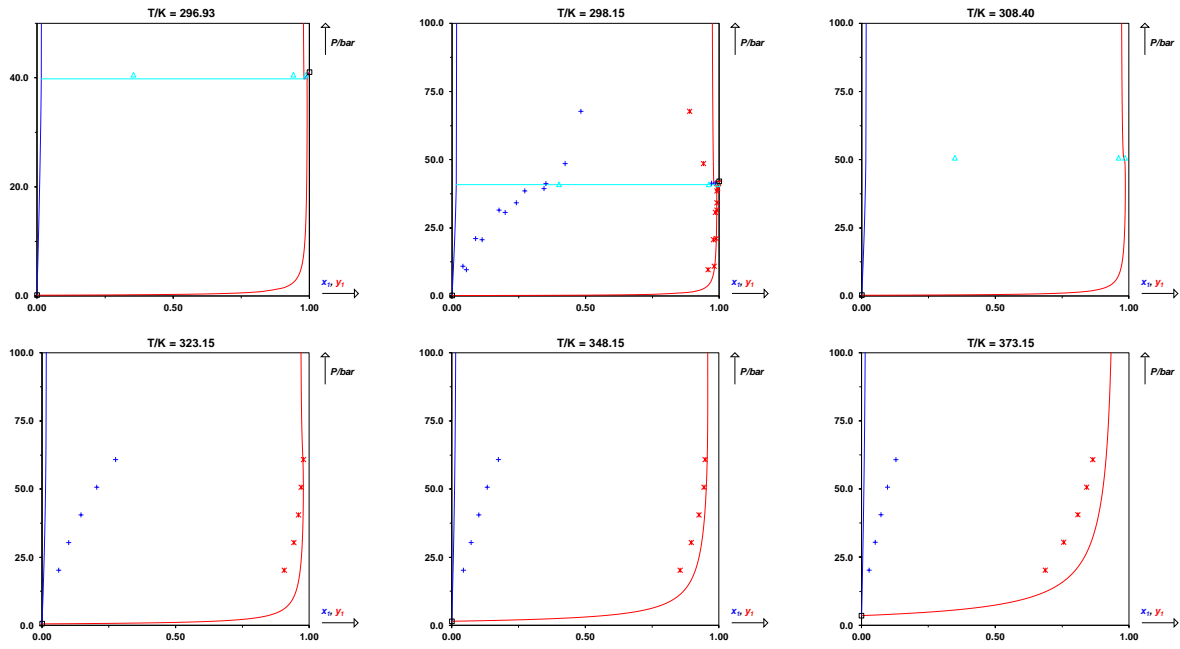
Ruffine, L. - Barreau, A. - Brunella, I. - Mougín, P. - José, J., New Apparatus for Low-Temperature Investigations: Measurements of the Multiphase Equilibrium of Mixtures Containing Methane, Ethane, Propane, Butane, Methanol, and Carbon Dioxide, Industrial & Engineering Chemistry Research. 44 (2005) 8387-8392. doi:10.1021/ie0506365

T / K	P / bar	x_1^a	x_1^b	y_1
241.00	9.400	0.4202	0.8876	0.9888
258.95	15.95	0.4245	0.8843	0.9999
283.43	29.27	0.4165	0.9339	0.9998

SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



PROPANE (1) + METHANOL (2)

CAS	74-98-6	67-56-1
InChiKey	ATUOYWLBWRKTHZ-UHFFFAOYSA-N	OKKJLVBELUTLKV-UHFFFAOYSA-N
T_c / K	369.83	512.50
P_c / bar	42.48	80.84
ω	0.152	0.566

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 165.6$

$B/\text{MPa} = 23.10$

Deviations

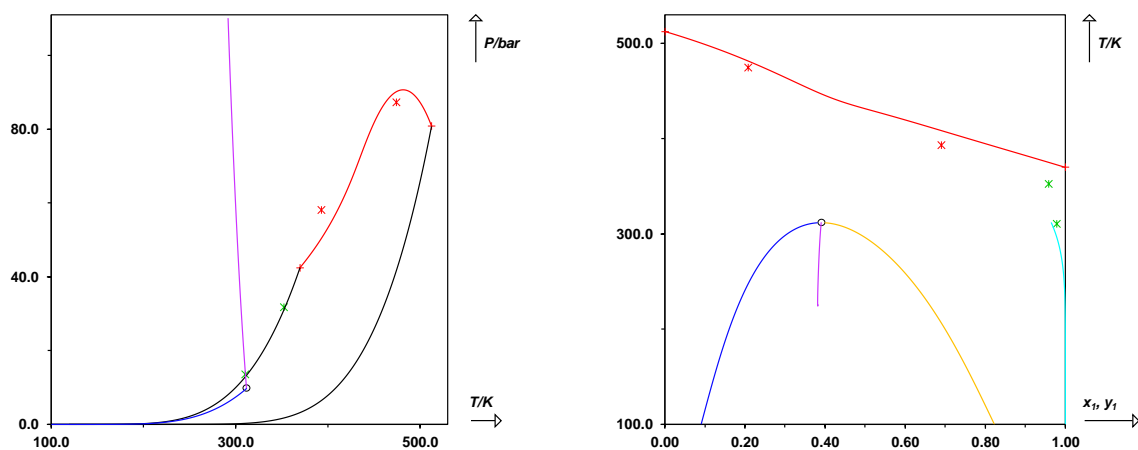
MAPE on $x = 71\%$

MAPE on $y = 18\%$

MAPE on $x_c = 20\%$

MAPE on $P_c = 8.3\%$

MAPE on $h^M = 28\%$



-----			9.400	0.0791	0.9085	
Isothermal phase equilibrium data			11.70	0.1102	0.9165	
-----			14.60	0.1697	0.9402	
Lev, Ah-Dong - Robinson, Donald B. - Chung, Samuels Y.-			17.50	0.2946	0.9518	
K. - Chen, C.-J., The equilibrium phase properties of the			18.30	0.4059	0.9540	
propane-methanol and n-Butane-methanol binary			18.80	0.5083	0.9549	
systems, The Canadian Journal of Chemical Engineering.			19.00	0.7414	0.9566	
70 (1992) 330-334. doi:10.1002/cjce.5450700217						
T / K =	310.70					
P / bar	x ₁	y ₁	Joung, Seung Nam - Shin, Hun Yong - Kim, Han Seok - Yoo,			
2.120	0.0160	0.8220	Ki-Pung, High-Pressure Vapor-Liquid Equilibrium Data			
5.050	0.0460	0.9220	and Modeling of Propane + Methanol and Propane +			
9.230	0.1240	0.9600	Ethanol Systems, Journal of Chemical & Engineering Data.			
11.37	0.2160	0.9640	49 (2004) 426-429. doi:10.1021/je0340506			
11.73	0.2390	0.9680	T / K =	343.21		
12.36	0.3480	0.9600	P / bar	x ₁	y ₁	
12.84	0.5320	0.9610	4.000	0.0143	0.6380	
13.04	0.7540	0.9580	7.400	0.0374	0.7864	
13.29	0.8970	0.9700	11.30	0.0684	0.8610	
13.43	0.9440	0.9740	14.60	0.1006	0.8933	
13.50	0.9790	0.9790	17.90	0.1468	0.9112	
13.41	0.9840	0.9800	21.30	0.2068	0.9253	
			22.30	0.2455	0.9333	
			23.60	0.3187	0.9363	
			24.80	0.4068	0.9387	
			25.40	0.6108	0.9367	
			25.80	0.7627	0.9455	
Galivel-Solastiouk, Francine - Laugier, Serge - Richon,						
Dominique, Vapor-liquid equilibrium data for the			Lev, Ah-Dong - Robinson, Donald B. - Chung, Samuels Y.-			
propane-methanol and propane-methanol-carbon			K. - Chen, C.-J., The equilibrium phase properties of the			
dioxide system, Fluid Phase Equilibria. 28 (1986) 73-85.			propane-methanol and n-Butane-methanol binary			
doi:10.1016/0378-3812(86)85069-5			systems, The Canadian Journal of Chemical Engineering.			
T / K =	313.10		70 (1992) 330-334. doi:10.1002/cjce.5450700217			
P / bar	x ₁	y ₁	T / K =	352.20		
3.500	0.0252	0.8780	P / bar	x ₁	y ₁	
5.100	0.0386	0.9000	5.600	0.0200	0.6600	
6.200	0.0520	0.9270	11.37	0.0510	0.8170	
7.120	0.0750	0.9370	17.27	0.0970	0.8680	
8.400	0.0840	0.9470	23.89	0.1850	0.9050	
10.60	0.1460	0.9560	27.89	0.2920	0.9180	
11.51	0.1950	0.9650	30.66	0.5430	0.9210	
12.50	0.2630	0.9660	31.31	0.7250	0.9270	
13.10	0.3870	0.9690	31.73	0.9570	0.9550	
13.23	0.4110	0.9720	31.80	0.9580	0.9580	AZEO
13.30	0.4490	0.9680	31.56	0.9750	0.9660	
13.60	0.7520	0.9650				
Joung, Seung Nam - Shin, Hun Yong - Kim, Han Seok - Yoo,			Galivel-Solastiouk, Francine - Laugier, Serge - Richon,			
Ki-Pung, High-Pressure Vapor-Liquid Equilibrium Data			Dominique, Vapor-liquid equilibrium data for the			
and Modeling of Propane + Methanol and Propane +			propane-methanol and propane-methanol-carbon			
Ethanol Systems, Journal of Chemical & Engineering Data.			dioxide system, Fluid Phase Equilibria. 28 (1986) 73-85.			
49 (2004) 426-429. doi:10.1021/je0340506			doi:10.1016/0378-3812(86)85069-5			
T / K =	327.95		T / K =	373.10		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁	
3.500	0.0192	0.7501				
6.600	0.0493	0.8721				

SA-NA systems (BAC = 5)

8.800	0.0210	0.5370		Thermodynamics.	25	(1993)	999-1004.
18.60	0.0670	0.7540		doi:10.1006/jcht.1993.1095			
22.60	0.0920	0.7960		T / K =	253.15		
30.40	0.1560	0.8470		P / bar =	50.00		
34.90	0.2130	0.8630		$h^M / J.mol^{-1}$	z_1		
39.00	0.3060	0.8900		62.10	0.0323		
40.20	0.3570	0.8760		153.70	0.0948		
42.80	0.6480	0.8420		198.00	0.1346		

Lev, Ah-Dong - Robinson, Donald B. - Chung, Samuels Y.-
K. - Chen, C.-J., The equilibrium phase properties of the
propane-methanol and n-Butane-methanol binary
systems, The Canadian Journal of Chemical Engineering.
70 (1992) 330-334. doi:10.1002/cjce.5450700217

T / K = 393.00

P / bar	x_1	y_1	
14.46	0.0270	0.5020	
22.04	0.0540	0.6340	
31.01	0.0950	0.7180	
41.83	0.1710	0.7700	
48.65	0.2420	0.7930	
54.13	0.3710	0.7920	
56.92	0.5440	0.7710	
57.32	0.5890	0.7640	
58.10	0.6900	0.6900	CRIT

274.10	0.2500
296.40	0.3328
299.70	0.4118
295.40	0.4463
291.20	0.4828
281.00	0.5213
272.30	0.5621
259.20	0.6053
245.90	0.6512
235.60	0.6752
218.60	0.7256
198.10	0.7794
182.50	0.8077
148.80	0.8673
103.70	0.9312
70.60	0.9650

Lev, Ah-Dong - Robinson, Donald B. - Chung, Samuels Y.-
K. - Chen, C.-J., The equilibrium phase properties of the
propane-methanol and n-Butane-methanol binary
systems, The Canadian Journal of Chemical Engineering.
70 (1992) 330-334. doi:10.1002/cjce.5450700217

T / K = 474.30

P / bar	x_1	y_1	
53.01	0.0280	0.1460	
60.65	0.0500	0.1990	
65.96	0.0660	0.2310	
75.20	0.1000	0.2650	
81.03	0.1320	0.2740	
85.42	0.1550	0.2610	
86.63	0.1730	0.2400	
87.30	0.2080	0.2080	CRIT

Sipowska, J.T. - Ott, J.B. - Woolley, A.T. - Marchant, B.G. -
Gruszkiewicz, M.S., Excess enthalpies for (propane +
methanol) at the pressure 5 MPa and the temperatures
(253.15, 258.15, 263.15, and 273.15) K. The effect of
water as an impurity on the (liquid + liquid) equilibria in
(propane + methanol), The Journal of Chemical
Thermodynamics. 25 (1993) 999-1004.
doi:10.1006/jcht.1993.1095

T / K = 283.15

P / bar = 50.00

$h^M / J.mol^{-1}$	z_1
57.80	0.0323
151.60	0.0948
193.80	0.1346
233.10	0.1778
278.90	0.2500
310.00	0.3328
325.50	0.4118
329.30	0.4828
326.50	0.5621
312.90	0.6512
287.40	0.7256
264.00	0.8077
213.10	0.8987
143.70	0.9650

Enthalpy of mixing

Sipowska, J.T. - Ott, J.B. - Woolley, A.T. - Marchant, B.G. -
Gruszkiewicz, M.S., Excess enthalpies for (propane +
methanol) at the pressure 5 MPa and the temperatures
(253.15, 258.15, 263.15, and 273.15) K. The effect of
water as an impurity on the (liquid + liquid) equilibria in
(propane + methanol), The Journal of Chemical

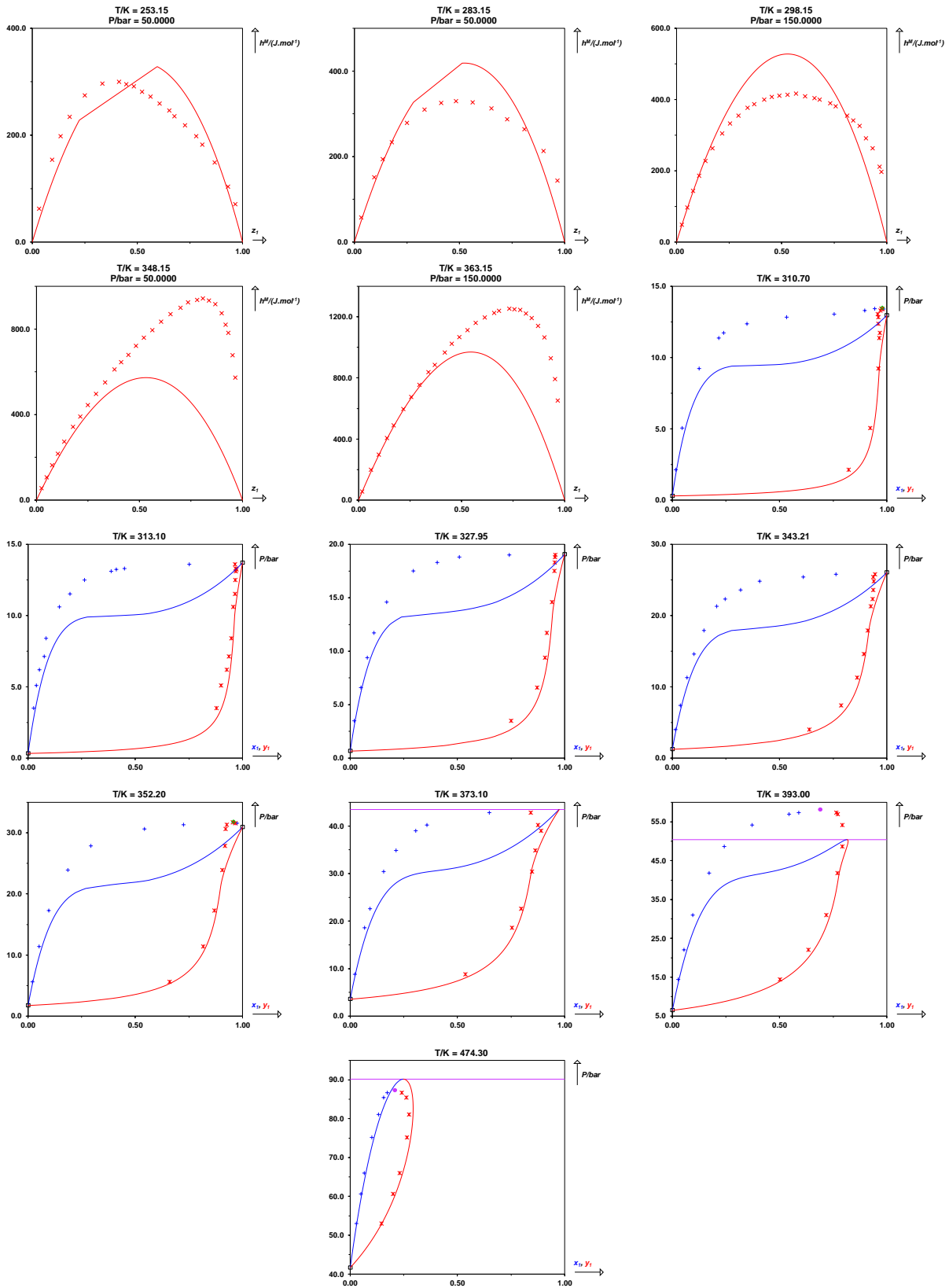
SA-NA systems (BAC = 5)

Sipowska, J.T. - Ott, J.B. - Neely, B.J. - Izatt, R.M., Excess enthalpies for (propane + methanol) at the temperatures (298.15, 323.15, 348.15, and 373.15) K and pressures (5, 10, and 15) MPa, and at 363.15K and (5 and 15) MPa, The Journal of Chemical Thermodynamics. 23 (1991) 551-559. doi:10.1016/S0021-9614(05)80098-9	217.10	0.1042
T / K = 298.15	273.10	0.1343
P / bar = 150.00	342.00	0.1774
$h^M / \text{J.mol}^{-1}$ z_1	390.80	0.2123
48.90 0.0245	444.60	0.2495
97.10 0.0504	497.00	0.2894
144.00 0.0777	550.30	0.3322
186.10 0.1066	610.60	0.3784
227.70 0.1373	644.80	0.4111
263.30 0.1699	679.40	0.4457
304.60 0.2166	721.70	0.4821
332.80 0.2543	759.10	0.5206
355.00 0.2947	795.40	0.5614
376.80 0.3379	833.80	0.6046
386.70 0.3685	869.70	0.6506
399.90 0.4173	899.70	0.6994
407.60 0.4520	924.20	0.7356
410.80 0.4885	936.60	0.7790
413.40 0.5270	943.60	0.8073
416.50 0.5677	933.70	0.8366
409.00 0.6107	915.70	0.8670
404.10 0.6564	873.40	0.8984
400.10 0.6802	820.10	0.9178
389.20 0.7302	781.80	0.9310
380.80 0.7563	677.90	0.9512
355.00 0.8112	573.40	0.9649
341.20 0.8401	Sipowska, J.T. - Ott, J.B. - Neely, B.J. - Izatt, R.M., Excess enthalpies for (propane + methanol) at the temperatures (298.15, 323.15, 348.15, and 373.15) K and pressures (5, 10, and 15) MPa, and at 363.15K and (5 and 15) MPa, The Journal of Chemical Thermodynamics. 23 (1991) 551-559. doi:10.1016/S0021-9614(05)80098-9	
325.90 0.8699	T / K = 363.15	
291.20 0.9007	P / bar = 150.00	
263.30 0.9326	$h^M / \text{J.mol}^{-1}$ z_1	
211.50 0.9657	56.20	0.0162
197.40 0.9742	198.80	0.0594
Sipowska, J.T. - Ott, J.B. - Neely, B.J. - Izatt, R.M., Excess enthalpies for (propane + methanol) at the temperatures (298.15, 323.15, 348.15, and 373.15) K and pressures (5, 10, and 15) MPa, and at 363.15K and (5 and 15) MPa, The Journal of Chemical Thermodynamics. 23 (1991) 551-559. doi:10.1016/S0021-9614(05)80098-9	297.70	0.0970
T / K = 348.15	405.40	0.1376
P / bar = 50.00	489.80	0.1702
$h^M / \text{J.mol}^{-1}$ z_1	596.60	0.2170
56.10 0.0239	676.00	0.2548
106.90 0.0492	754.70	0.2952
162.90 0.0759	838.20	0.3384
	884.80	0.3691
	967.20	0.4179
	1023.2	0.4525
	1066.6	0.4891
	1112.3	0.5276

SA-NA systems (BAC = 5)

1159.7	0.5682
1196.1	0.6113
1226.4	0.6569
1238.6	0.6807
1252.6	0.7306
1249.5	0.7567
1245.3	0.7837
1221.3	0.8116
1191.5	0.8404
1139.7	0.8701
1064.2	0.9009
928.30	0.9328
791.70	0.9525
651.10	0.9658

SA-NA systems (BAC = 5)



METHANOL (1) + BENZENE (2)

CAS	67-56-1	71-43-2
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	512.50	562.05
P_c / bar	80.84	48.95
ω	0.566	0.210

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = 261.8$

$B/\text{MPa} = 182.8$

Deviations

MAPE on $x = 46\%$

MAPE on $y = 17\%$

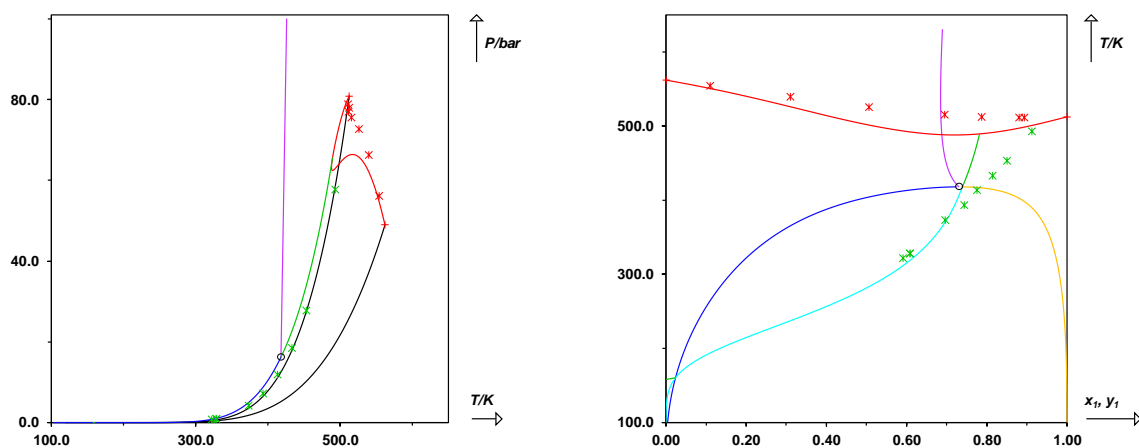
MAPE on $x_c = 75\%$

MAPE on $P_c = 8.8\%$

MAPE on $x_{az} = 27\%$

MAPE on $P_{az} = 23\%$

MAPE on $h^M = 19\%$



Isothermal phase equilibrium data					
-----			0.3968	0.0227	0.2523
Isothermal phase equilibrium data			0.4149	0.0272	0.2909
-----			0.4314	0.0317	0.3072
Toghiani, Hossein - Toghiani, Rebecca K. - Viswanath, Dabir S., Vapor-liquid equilibria for the methanol-benzene and methanol-thiophene systems, Journal of Chemical & Engineering Data. 39 (1994) 63-67. doi:10.1021/je00013a018			0.4670	0.0514	0.3775
T / K =	318.15		0.4981	0.0634	0.4164
P / bar	x ₁	y ₁	0.5160	0.0860	0.4412
0.3274	0.0037	0.0882	0.5346	0.1014	0.4683
0.3536	0.0102	0.1567	0.5548	0.1272	0.4899
0.3859	0.0161	0.2364	0.5718	0.1538	0.5093
0.4096	0.0207	0.2794	0.5894	0.2250	0.5325
0.4423	0.0314	0.3391	0.5965	0.2701	0.5438
0.4683	0.0431	0.3794	0.6044	0.3607	0.5588
0.5049	0.0613	0.4306	0.6081	0.4721	0.5765
0.5322	0.0854	0.4642	0.6110	0.5543	0.5899
0.5557	0.1263	0.4921	0.6092	0.6316	0.6045
0.5745	0.1811	0.5171	0.6064	0.7027	0.6249
0.5843	0.2334	0.5288	0.6054	0.7245	0.6319
0.5940	0.3217	0.5450	0.6038	0.7597	0.6437
0.5980	0.3805	0.5538	0.5772	0.8680	0.7177
0.6002	0.4201	0.5590	0.5493	0.9173	0.7786
0.6024	0.4746	0.5673	0.4961	0.9730	0.9002
0.6042	0.5420	0.5783	0.4737	0.9853	0.9397
0.6044	0.5716	0.5821	Scatchard, George - Wood, Scott E. - Mochel, John M., Vapor-Liquid Equilibrium. VI. Benzene-Methanol Mixtures, Journal of the American Chemical Society. 68 (1946) 1957-1960. doi:10.1021/ja01214a024		
0.6042	0.6164	0.5908	T / K = 328.15		
0.6035	0.6509	0.5990	P / bar	x ₁	y ₁
0.6022	0.6793	0.6067	0.6211	0.0304	0.3019
0.5987	0.7259	0.6216	0.7028	0.0493	0.4051
0.5948	0.7575	0.6346	0.7966	0.1031	0.4841
0.5832	0.8171	0.6681	0.8856	0.3297	0.5540
0.5621	0.8744	0.7181	0.9008	0.4874	0.5845
0.5469	0.9033	0.7525	0.9013	0.4984	0.5858
0.5304	0.9264	0.7896	0.9045	0.6076	0.6078
0.5101	0.9497	0.8368	0.9045	0.6079	0.6079 AZEO
0.5005	0.9594	0.8599	0.8865	0.7896	0.6716
0.4877	0.9707	0.8916	0.8297	0.9014	0.7697
0.4754	0.9804	0.9222	Butcher, K. L. - Medani, M. S., Thermodynamic properties of methanol-benzene mixtures at elevated temperatures, Journal of Applied Chemistry. 18 (2007) 100-107. doi:10.1002/jctb.5010180402		
0.4623	0.9895	0.9558	T / K = 373.15		
Strubl, K. - Svoboda, V. - Holub, R., Liquid-vapour equilibrium. LV. The system methanol-benzene, Collection of Czechoslovak Chemical Communications. 37 (1972) 3522-3531. doi:10.1135/ccccc19723522			P / bar	x ₁	y ₁
T / K =	318.15		3.123	0.0926	0.4577
P / bar	x ₁	y ₁	3.468	0.1586	0.5324
0.3168	0.0032	0.0555	3.834	0.3328	0.6075
0.3272	0.0051	0.0869	4.054	0.4776	0.6422
0.3494	0.0100	0.1527	4.116	0.5940	0.6708

SA-NA systems (BAC = 5)

4.178	0.6865	0.6929		15.40	0.2967	0.5965
4.185	0.6961	0.6961	AZEO	16.86	0.4449	0.6645
4.164	0.7290	0.7084		17.62	0.5721	0.7129
4.116	0.7747	0.7271		18.04	0.6775	0.7487
4.027	0.8596	0.7868		18.48	0.8140	0.8140 AZEO
3.951	0.9065	0.8376		18.44	0.8461	0.8328

Butcher, K. L. - Medani, M. S., Thermodynamic properties of methanol-benzene mixtures at elevated temperatures, Journal of Applied Chemistry. 18 (2007) 100-107. doi:10.1002/jctb.5010180402

T / K = 393.15

P / bar	x ₁	y ₁	
4.868	0.0865	0.4212	
5.633	0.1555	0.5162	
6.467	0.3253	0.6136	
6.819	0.4763	0.6578	
6.998	0.5870	0.6882	
7.122	0.6857	0.7167	
7.136	0.7430	0.7430	AZEO
7.109	0.7730	0.7597	
7.074	0.8070	0.7765	
7.012	0.8606	0.8171	
6.860	0.9148	0.8668	

Butcher, K. L. - Medani, M. S., Thermodynamic properties of methanol-benzene mixtures at elevated temperatures, Journal of Applied Chemistry. 18 (2007) 100-107. doi:10.1002/jctb.5010180402

T / K = 413.15

P / bar	x ₁	y ₁	
6.743	0.0619	0.3224	
8.446	0.1325	0.4633	
9.225	0.2018	0.5469	
10.32	0.3105	0.6127	
11.09	0.4560	0.6644	
11.45	0.5886	0.7073	
11.55	0.6845	0.7374	
11.87	0.7748	0.7748	AZEO
11.84	0.8095	0.7938	
11.72	0.8614	0.8317	
11.55	0.9159	0.8773	

Butcher, K. L. - Medani, M. S., Thermodynamic properties of methanol-benzene mixtures at elevated temperatures, Journal of Applied Chemistry. 18 (2007) 100-107. doi:10.1002/jctb.5010180402

T / K = 433.15

P / bar	x ₁	y ₁
11.24	0.0943	0.3890
13.01	0.1589	0.4873

15.40	0.2967	0.5965
16.86	0.4449	0.6645
17.62	0.5721	0.7129
18.04	0.6775	0.7487
18.48	0.8140	0.8140 AZEO
18.44	0.8461	0.8328
18.32	0.9176	0.8920
17.96	0.9509	0.9287

Butcher, K. L. - Medani, M. S., Thermodynamic properties of methanol-benzene mixtures at elevated temperatures, Journal of Applied Chemistry. 18 (2007) 100-107. doi:10.1002/jctb.5010180402

T / K = 453.15

P / bar	x ₁	y ₁	
15.22	0.0856	0.3361	
21.56	0.2790	0.5697	
25.75	0.5538	0.7131	
26.86	0.6632	0.7583	
27.68	0.8450	0.8555	
27.72	0.8500	0.8500	AZEO
27.61	0.8942	0.8915	
27.34	0.9511	0.9461	

Butcher, K. L. - Medani, M. S., Thermodynamic properties of methanol-benzene mixtures at elevated temperatures, Journal of Applied Chemistry. 18 (2007) 100-107. doi:10.1002/jctb.5010180402

T / K = 493.15

P / bar	x ₁	y ₁	
22.62	0.0233	0.1068	
27.20	0.0748	0.2626	
34.30	0.1778	0.4485	
42.71	0.3617	0.6044	
47.78	0.4996	0.6864	
52.30	0.6511	0.7606	
55.19	0.7474	0.8117	
56.61	0.8235	0.8569	
57.64	0.8933	0.8999	
57.72	0.9120	0.9120	AZEO
57.57	0.9521	0.9477	

Isobaric phase equilibrium data

Strubl, K. - Voňka, P. - Svoboda, V. - Holub, R., Liquid-vapour equilibrium LVI. Correlation of the benzene-methanol systems, Collection of Czechoslovak Chemical Communications. 38 (1973) 468-476. doi:10.1135/ccccc19730468

P / bar = 0.3073

SA-NA systems (BAC = 5)

T / K	x ₁	y ₁			
316.55	0.0052	0.0967	321.65	0.7006	0.6198
310.34	0.0257	0.3046	321.84	0.7500	0.6382
306.18	0.0660	0.4255	322.20	0.8019	0.6651
304.80	0.1116	0.4712	322.82	0.8536	0.7046
304.28	0.1454	0.4827	323.67	0.8970	0.7532
303.61	0.2005	0.5072	324.23	0.9132	0.7825
303.27	0.2532	0.5156	325.12	0.9429	0.8296
303.10	0.3214	0.5260	325.83	0.9591	0.8669
302.99	0.3752	0.5365	326.53	0.9727	0.9035
302.95	0.4278	0.5418	327.20	0.9838	0.9385
302.92	0.4626	0.5478	327.55	0.9891	0.9568
303.01	0.6510	0.5811			
303.18	0.7142	0.5990			
303.74	0.8104	0.6454			
304.59	0.8778	0.7047			
306.24	0.9371	0.7972			
307.62	0.9662	0.8722			
309.08	0.9847	0.9464			
309.53	0.9933	0.9693			
309.72	0.9956	0.9805			

Toghiani, Hossein - Toghiani, Rebecca K. - Viswanath, Dabir S., Vapor-liquid equilibria for the methanol-benzene and methanol-thiophene systems, Journal of Chemical & Engineering Data. 39 (1994) 63-67. doi:10.1021/je00013a018

P / bar = 0.6952

T / K	x ₁	y ₁	
340.72	0.0011	0.0274	
339.75	0.0040	0.0576	
336.89	0.0120	0.1504	
334.34	0.0196	0.2236	
332.89	0.0254	0.2698	
330.84	0.0337	0.3257	
329.23	0.0449	0.3650	
328.07	0.0516	0.3951	
327.04	0.0613	0.4201	
325.94	0.0749	0.4463	
324.92	0.0932	0.4694	
324.01	0.1207	0.4950	
323.02	0.1749	0.5177	
322.38	0.2451	0.5363	
321.92	0.3451	0.5540	
321.65	0.4589	0.5692	
321.54	0.5494	0.5839	
321.53	0.5916	0.5916	AZEO
321.53	0.5938	0.5923	
321.54	0.6274	0.5993	
321.58	0.6632	0.6087	

Hudson, John W. - Van Winkle, Matthew, Multicomponent vapor-liquid equilibria in systems of mixed positive and negative deviations, Journal of Chemical & Engineering Data. 14 (1969) 310-318. doi:10.1021/je60042a025

P / bar = 1.013

T / K	x ₁	y ₁
343.82	0.0260	0.2670
339.59	0.0500	0.3710
336.02	0.0880	0.4570
333.35	0.1640	0.5260
331.79	0.3330	0.5590
331.17	0.5490	0.5950
331.25	0.6990	0.6330
331.62	0.7820	0.6650
333.05	0.8980	0.7600
335.86	0.9730	0.9070

Triday, J. - Andrade, A. - Aguirre Ode, F., Isobaric study of the binary systems formed by thiophene or benzene with light alcohols, Scientia Valparaiso. 43 (1978) 1-24.

P / bar = 1.013

T / K	x ₁	y ₁
350.18	0.0100	0.1100
339.09	0.0540	0.3900
334.89	0.1020	0.4850
333.17	0.1650	0.5250
332.01	0.2600	0.5560
331.63	0.3460	0.5680
331.45	0.4080	0.5780
331.27	0.4740	0.5880
331.20	0.5510	0.6020
331.12	0.6220	0.6120
331.14	0.6330	0.6190
331.23	0.7060	0.6400
331.30	0.7380	0.6500
331.74	0.8070	0.6850
332.77	0.8820	0.7480
333.85	0.9270	0.8060

335.01 0.9560 0.8680

53.90 0.9625

Enthalpy of mixing

Cen, P. - Zhu, Z., The Measurement of Mixing Heat and the Prediction of Vapor-Liquid Equilibrium Data for Hydrocarbon - Alcohol Systems, Huagong Xuebao. 35 (1984) 51-65.

T / K = 283.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

384.50 0.0877

451.60 0.1500

480.10 0.2076

497.20 0.2620

500.00 0.3121

497.70 0.3601

468.80 0.4468

428.10 0.5239

388.80 0.5930

344.70 0.6552

302.50 0.7115

255.90 0.7628

201.40 0.8096

155.30 0.8526

96.30 0.9108

43.80 0.9625

Cen, P. - Zhu, Z., The Measurement of Mixing Heat and the Prediction of Vapor-Liquid Equilibrium Data for Hydrocarbon - Alcohol Systems, Huagong Xuebao. 35 (1984) 51-65.

T / K = 288.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

488.20 0.0877

562.10 0.1500

607.70 0.2076

620.70 0.2620

621.60 0.3121

616.30 0.3601

581.40 0.4468

538.50 0.5239

488.60 0.5930

428.60 0.6552

367.30 0.7115

305.40 0.7628

248.10 0.8096

197.00 0.8526

121.20 0.9108

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 293.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

229.21 0.0429

400.04 0.0839

519.12 0.1230

578.55 0.1604

609.77 0.1962

615.82 0.3545

556.50 0.4849

471.24 0.5942

381.06 0.6872

286.01 0.7672

196.51 0.8368

121.52 0.8978

52.58 0.9519

Zhao, J. - Dai, M., Studies on Thermodynamic Properties of Binary Systems containing Alcohols. I. Excess Enthalpies of C1 to C5 Normal Alcohols + Benzene, Wuli Huaxue Xuebao. 2 (1986) 141-145.

T / K = 298.15

P / bar = 1.013

$h^M / \text{J.mol}^{-1}$ z_1

473.60 0.0577

594.50 0.0920

657.50 0.1250

714.20 0.1874

736.30 0.2454

744.30 0.2995

734.80 0.3500

693.70 0.4419

648.50 0.5037

599.40 0.5603

533.20 0.6287

462.30 0.6902

390.00 0.7458

318.70 0.7962

249.60 0.8423

187.40 0.8845

128.80 0.9232

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary

mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 303.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

253.39 0.0429

466.89 0.0839

611.74 0.1230

676.75 0.1604

713.74 0.1962

719.85 0.3545

645.35 0.4849

557.10 0.5942

445.51 0.6872

336.75 0.7672

234.25 0.8368

142.48 0.8978

59.46 0.9519

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 308.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

269.04 0.0429

497.94 0.0839

653.28 0.1230

738.16 0.1604

767.75 0.1962

767.39 0.3545

699.15 0.4849

600.26 0.5942

476.03 0.6872

366.53 0.7672

255.96 0.8368

152.54 0.8978

63.13 0.9519

Vesely, F. - Hynek, V. - Svoboda, V. - Holub, R., Isothermal calorimeter for measuring endothermic heats of mixing, Collect. Czech. Chem. Commun. 39 (1974) 355-365. doi:10.1135/cccc19740355

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

599.00 0.0628

753.00 0.0981

812.40 0.1218

925.90 0.1857

958.40 0.2275

974.10 0.2848

970.20 0.3368

940.00 0.4057

933.90 0.4169

867.60 0.5004

781.80 0.5672

626.90 0.6751

616.20 0.6816

612.00 0.6827

609.30 0.6855

475.90 0.7621

277.10 0.8667

Williamson, A.G. - Scott, R.L., Heats of Mixing of Non-Electrolyte Solutions. I. Ethanol + Benzene and Methanol + Benzene, J. Phys. Chem. 64 (1960) 440-442. doi:10.1021/j100833a015

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

862.48 0.1790

895.98 0.2070

937.84 0.2980

942.03 0.3450

908.54 0.4190

808.05 0.5300

577.78 0.7030

397.75 0.8030

200.97 0.8990

Critical point

Skaates, J.M. - Kay, W.B., The phase relations of binary systems that form azeotropes, Chemical Engineering Science. 19 (1964) 431-444. doi:10.1016/0009-2509(64)85070-3

T / K P / bar x_1

511.09 78.83 0.8936

515.59 75.51 0.6944

525.74 72.74 0.5054

539.75 66.22 0.3106

554.14 56.10 0.1106

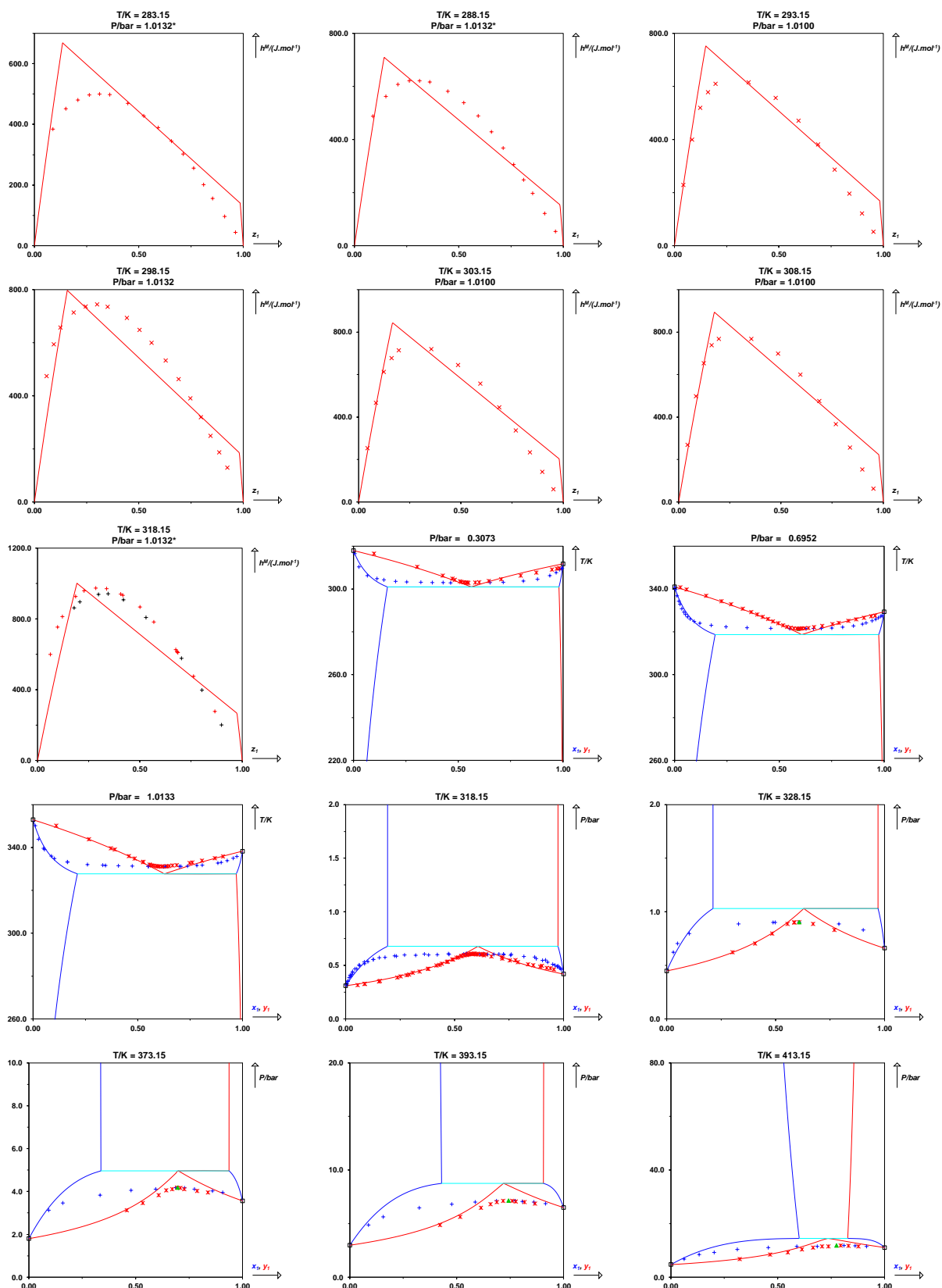
Krichevskii, I.R. - Khazanova, N.E. - Linshits, L.R., The liquid-vapor equilibrium in the benzene-methanol system at high pressures, Zh. Fiz. Khim. 31 (1957) 2711-2716.

T / K P / bar x_1

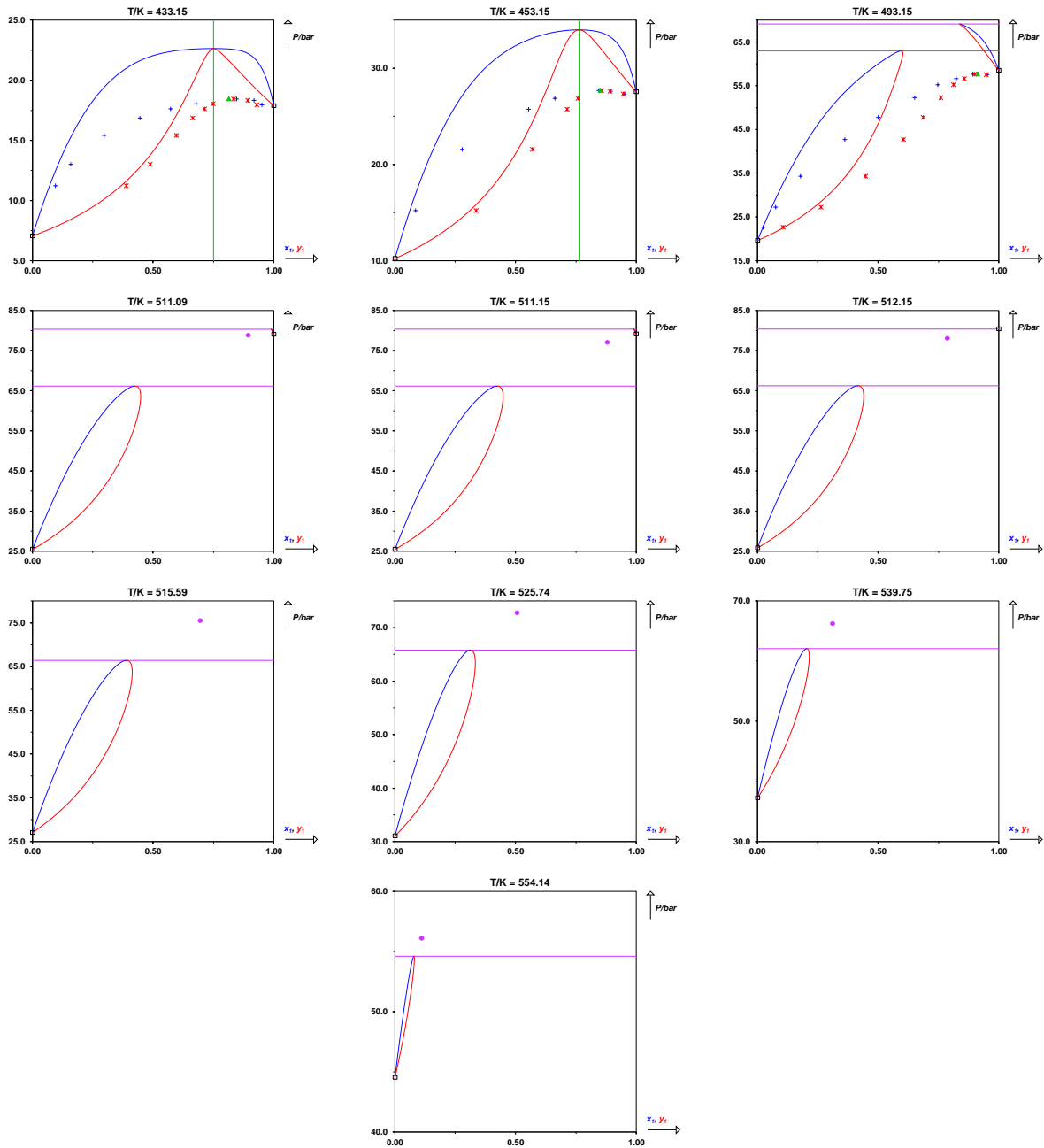
511.15 77.01 0.8797

512.15 78.02 0.7869

SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



METHANOL (1) + n-HEXANE (2)

CAS	67-56-1	110-54-3
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	VLKZOEYOYAKHREP-UHFFFAOYSA-N
T_c / K	512.50	507.60
P_c / bar	80.84	30.25
ω	0.566	0.301

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 361.4$$

$$B/\text{MPa} = 764.0$$

Deviations

$$\text{MAPE on } x = 67\%$$

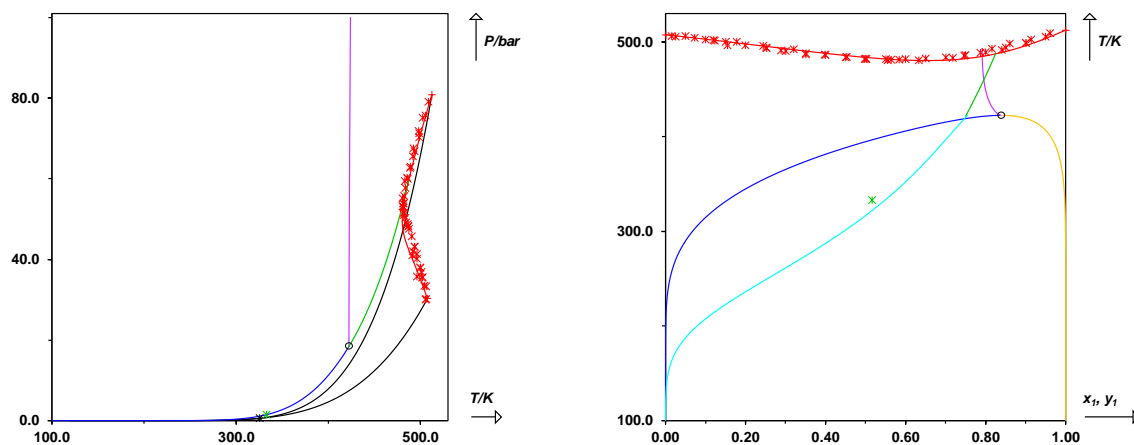
$$\text{MAPE on } y = 7.3\%$$

$$\text{MAPE on } x_c = 12\%$$

$$\text{MAPE on } P_c = 6.7\%$$

$$\text{MAPE on } h^M = 52\%$$

$$\text{MAPE on } c_p^M = 200\%$$



-----			346.60	0.0058	0.1815
Isothermal phase equilibrium data			343.75	0.0092	0.2555
-----			340.21	0.0159	0.3334
Scheller, M. - Schuberth, H. - Könncke, H. G., Ergebnisse von Dampf-Flüssigkeits-Phasengleichgewichtsuntersuchungen am System n-Hexan/Methylcyclohexan/Methanol bei 60°C, Journal für Praktische Chemie. 311 (1969) 974-982. doi:10.1002/prac.19693110616			337.17	0.0248	0.4011
T / K = 333.15			335.80	0.0304	0.4289
P / bar	x ₁	y ₁	334.24	0.0458	0.4550
1.075	0.0050	0.2850	332.70	0.0954	0.4813
1.309	0.0160	0.4070	331.83	0.1908	0.5042
1.380	0.0330	0.4380	331.59	0.2811	0.5091
1.419	0.0600	0.4630	331.53	0.6501	0.5160
1.435	0.0790	0.4720	331.84	0.8221	0.5282
1.451	0.0980	0.4820	332.15	0.8546	0.5358
1.472	0.1450	0.4880	333.07	0.9089	0.5704
1.483	0.1750	0.4960	334.37	0.9404	0.6116
1.490	0.2180	0.4990	338.48	0.9683	0.7183
1.494	0.3990	0.5120	341.23	0.9811	0.7906
1.496	0.4790	0.5160	343.53	0.9905	0.8826
1.496	0.5160	0.5160	-----		
1.496	0.5220	0.5170	Enthalpy of mixing		
1.495	0.5700	0.5200	-----		
1.494	0.6130	0.5210	Kurihara, Kiyofumi - Iguchi, Takao - Banaka, Toshiaki - Ochi, Kenji - Kojima, Kazuo, Measurement and correlation of excess molar enthalpies for the partially miscible systems 2-butanone+water and methanol+hexane, Fluid Phase Equilibria. 180 (2001) 59-69. doi:10.1016/S0378-3812(00)00510-0		
1.493	0.6570	0.5220	T / K = 283.15		
1.493	0.7330	0.5230	P / bar = UNKNOWN (1.0132)		
1.490	0.7900	0.5240	h ^M / J.mol ⁻¹	x ₁	
1.478	0.8280	0.5330	151.40	0.0400	
1.450	0.8770	0.5400	166.20	0.0500	
1.442	0.8830	0.5430	201.20	0.0600	
1.418	0.9020	0.5610	221.20	0.0700	
1.385	0.9190	0.5740	244.30	0.0800	
1.316	0.9380	0.6160	262.60	0.0900	
1.265	0.9510	0.6450	278.40	0.1000	
1.216	0.9620	0.6810	300.00	0.1100	
1.167	0.9670	0.7140	304.20	0.1200	
1.115	0.9790	0.7520	319.40	0.1300	
1.105	0.9800	0.7630	329.60	0.2000	
-----			336.30	0.3000	
Isobaric phase equilibrium data			343.00	0.4010	
-----			357.40	0.5000	
Blanco, Ana Maria - Ortega, Juan, Experimental study of miscibility, density and isobaric vapor-liquid equilibrium values for mixtures of methanol in hydrocarbons (C5, C6), Fluid Phase Equilibria. 122 (1996) 207-222. doi:10.1016/0378-3812(96)03037-3			366.40	0.6000	
P / bar = 1.413			369.50	0.7000	
T / K	x ₁	y ₁	380.30	0.8000	
			374.40	0.8500	
			362.70	0.8600	
			344.30	0.8800	

SA-NA systems (BAC = 5)

300.80	0.9000	479.50	0.8112
272.90	0.9200	449.90	0.8352
208.50	0.9400	415.20	0.8587
150.00	0.9600	359.90	0.8888
		312.70	0.9101
		256.00	0.9317
Kurihara, Kiyofumi - Iguchi, Takao - Banaka, Toshiaki -		208.30	0.9474
Ochi, Kenji - Kojima, Kazuo, Measurement and correlation		152.50	0.9637
of excess molar enthalpies for the partially miscible		92.50	0.9792
systems 2-butanone+water and methanol+hexane, Fluid			
Phase Equilibria. 180 (2001) 59-69. doi:10.1016/S0378-			
3812(00)00510-0			
T / K =	293.15	van Ness, H.C. - Abbott, M.M., Excess enthalpy. Ethanol	
P / bar =	UNKNOWN (1.0132)	(ethyl alcohol)-n-hexane system, Int. Data Ser. Sel. Data	
$h^M / \text{J.mol}^{-1}$	x_1	Mixtures Ser. A. 1976 (1976)	
250.90	0.0600	T / K =	313.15
324.80	0.1000	P / bar =	2.100
376.80	0.1400	$h^M / \text{J.mol}^{-1}$	z_1
420.00	0.1900	384.20	0.0294
454.20	0.4000	531.00	0.0985
458.90	0.5000	656.80	0.2127
460.30	0.6000	712.20	0.3515
463.50	0.7000	714.90	0.4581
423.00	0.8200	697.80	0.5510
332.40	0.9000	676.30	0.6163
251.10	0.9300	654.70	0.6629
		635.40	0.6957
		612.30	0.7280
van Ness, H.C. - Abbott, M.M., Excess enthalpy. Ethanol		592.70	0.7511
(ethyl alcohol)-n-hexane system, Int. Data Ser. Sel. Data		547.40	0.7945
Mixtures Ser. A. 1976 (1976)		521.90	0.8140
T / K =	303.15	492.30	0.8339
P / bar =	2.100	452.90	0.8568
$h^M / \text{J.mol}^{-1}$	z_1	411.40	0.8775
176.00	0.0104	354.20	0.9023
206.60	0.0141	291.80	0.9252
234.50	0.0187	231.60	0.9442
263.30	0.0249	161.50	0.9636
288.70	0.0318	110.00	0.9762
310.30	0.0388		
329.80	0.0460		
351.90	0.0562	van Ness, H.C. - Abbott, M.M., Excess enthalpy. Ethanol	
430.10	0.1010	(ethyl alcohol)-n-hexane system, Int. Data Ser. Sel. Data	
488.40	0.1503	Mixtures Ser. A. 1976 (1976)	
529.20	0.1968	T / K =	323.15
579.60	0.2892	P / bar =	2.100
583.10	0.3004	$h^M / \text{J.mol}^{-1}$	z_1
587.70	0.3143	410.60	0.0284
588.00	0.3187	663.70	0.1044
533.00	0.7492	804.10	0.2272
525.70	0.7605	848.70	0.3714
518.20	0.7701	837.30	0.4759
503.70	0.7872	806.60	0.5622

SA-NA systems (BAC = 5)

775.10	0.6206	0.2900	0.0032
745.10	0.6634	0.9400	0.0051
718.30	0.6959	1.790	0.0073
691.10	0.7240	2.430	0.0099
669.70	0.7438	4.180	0.0160
619.30	0.7848		
594.20	0.8016		
559.90	0.8225		
523.90	0.8418		
472.00	0.8664		
417.10	0.8891		
348.80	0.9137		
259.80	0.9408		
177.30	0.9622		

Critical point

Liu, Jianguo - Qin, Zhangfeng - Wang, Guofu - Hou, Xianglin - Wang, Jianguo, Critical Properties of Binary and Ternary Mixtures of Hexane + Methanol, Hexane + Carbon Dioxide, Methanol + Carbon Dioxide, and Hexane + Carbon Dioxide + Methanol, Journal of Chemical & Engineering Data. 48 (2003) 1610-1613. doi:10.1021/je034127q

T / K	P / bar	x ₁
480.40	55.20	0.6330
480.60	53.20	0.5550
481.90	51.00	0.4980
483.30	59.40	0.7170
484.30	49.10	0.4520
486.70	48.10	0.3980
488.60	62.70	0.7870
492.10	42.00	0.3200
492.50	67.50	0.8160
495.90	40.10	0.2440
498.00	71.90	0.8600
499.80	37.90	0.1780
502.00	35.40	0.1200
502.50	75.20	0.9140
504.60	33.50	0.0720
508.90	79.10	0.9610

Heat capacity of mixing

Andreoli-Ball, Lina - Patterson, Donald - Costas, Miguel - Cáceres-Alonso, Mercedes, Heat capacity and corresponding states in alkan-1-ol-n-alkane systems, Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases. 84 (1988) doi:10.1039/f19888403991

T / K = 298.15

P / bar = UNKNOWN (1.0132)

cp^M / J.mol⁻¹.K⁻¹ x₁

0.0123	0.0011
0.3033	0.0032
0.9583	0.0051
1.834	0.0073
4.265	0.0160
4.676	0.0194
5.467	0.0244
5.501	0.0256
7.108	0.0512
7.406	0.0529
8.588	0.0998
9.291	0.1444
9.889	0.2279

Costas, Miguel - Patterson, Donald, Self-association of alcohols in inert solvents. Apparent heat capacities and volumes of linear alcohols in hydrocarbons, Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases. 81 (1985) doi:10.1039/f19858100635

T / K = 298.15

P / bar = UNKNOWN (1.0132)

cp^M / J.mol⁻¹.K⁻¹ x₁

0.0200	0.0011
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de Loos, Th.W. - Poot, W. - de Swaan Arons, J., Vapour-liquid equilibria and critical phenomena in methanol + n-alkane systems, Fluid Phase Equilibria. 42 (1988) 209-227. doi:10.1016/0378-3812(88)80060-8

T / K	P / bar	x ₁
481.00	53.20	0.5630
482.05	51.60	0.5020
485.50	60.30	0.7460
486.60	48.30	0.3500
491.50	65.50	0.8400
493.60	43.20	0.2530
498.75	71.30	0.9000
501.10	36.90	0.1230

Zawisza, Andrzej, High-pressure liquid-vapour equilibria, critical state, and p(Vm, T, x) to 448.15 K and 4.053 MPa for {xC₆H₁₄ + (1-x)CH₃OH}, The Journal of Chemical

Thermodynamics. 17 (1985) 941-947. doi:10.1016/0021-9614(85)90007-2

T / K	P / bar	x_1
481.10	53.83	0.5842
491.08	41.01	0.2883
496.31	35.70	0.1547

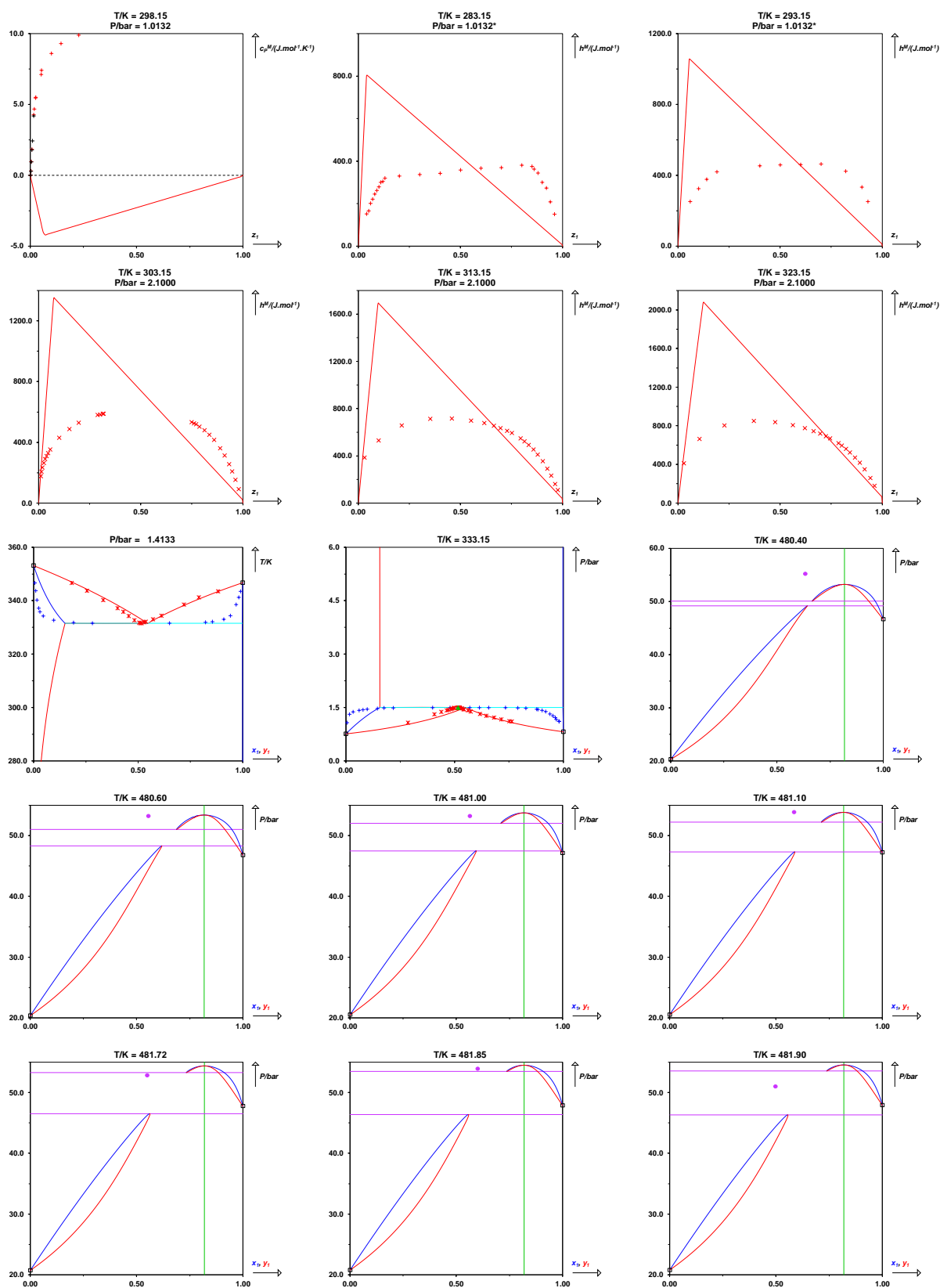
Gil, Laura - Blanco, Sofía T. - Rivas, Clara - Laga, Eduardo - Fernández, Javier - Artal, Manuela - Velasco, Inmaculada, Experimental determination of the critical loci for {n-C6H14 or CO2+alkan-1-ol} mixtures. Evaluation of their critical and subcritical behavior using PC-SAFT EoS, The Journal of Supercritical Fluids. 71 (2012) 26-44. doi:10.1016/j.supflu.2012.07.008

T / K	P / bar	x_1
481.72	52.82	0.5502
481.85	53.88	0.6002
482.22	55.71	0.6501
482.54	51.63	0.5000
483.56	57.67	0.7001
483.79	50.28	0.4498
485.92	60.01	0.7499
486.31	48.76	0.3999
487.67	47.63	0.3504
489.17	63.01	0.8000
490.40	45.72	0.3001
493.72	66.82	0.8500
493.86	43.21	0.2504
496.26	41.31	0.1999
498.87	70.34	0.9000
499.99	38.04	0.1501
502.72	35.56	0.1004
505.84	75.77	0.9501
506.01	33.31	0.0498

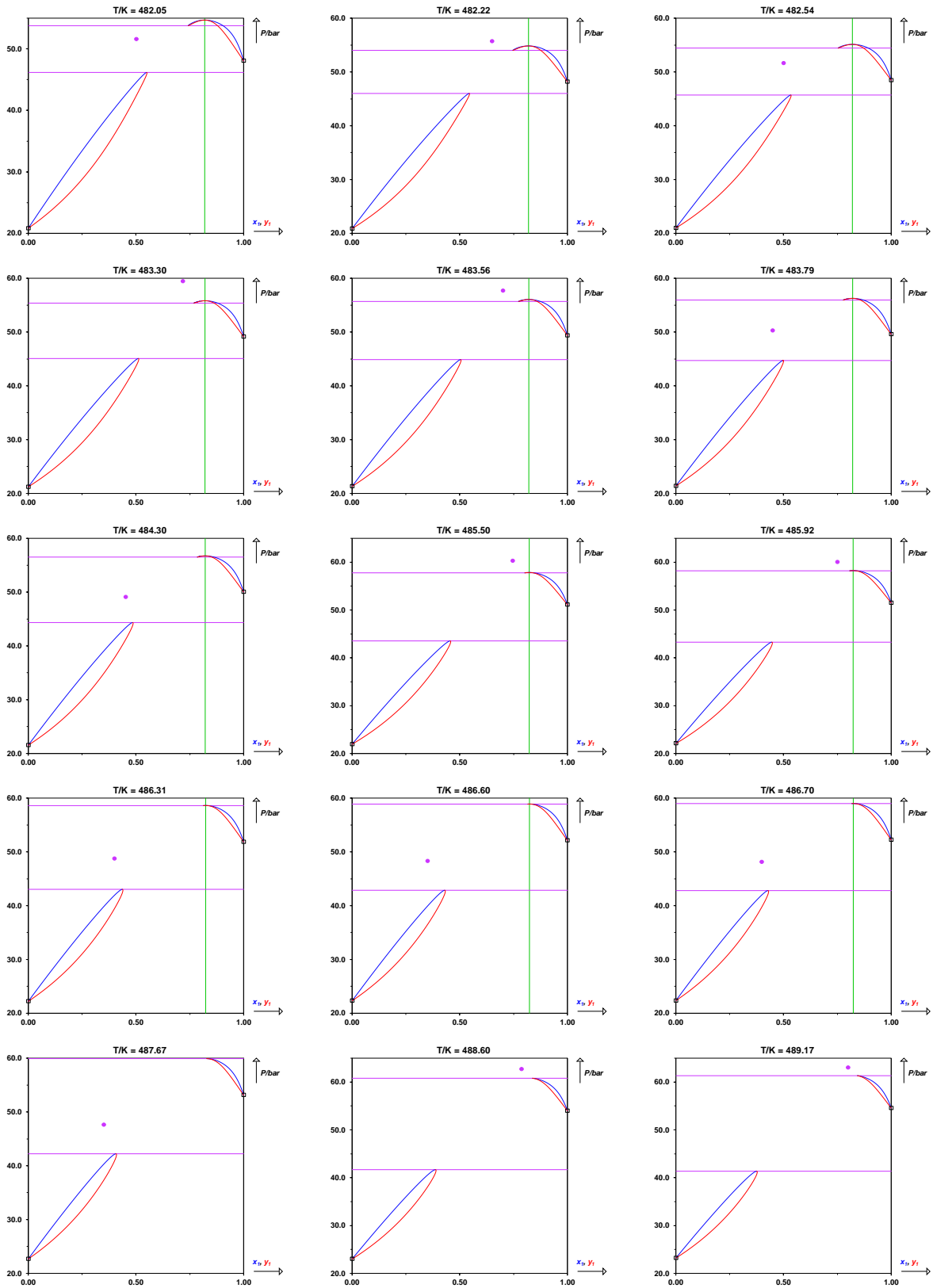
Gao, Liang - Hou, Zhenshan - Zhang, Haifei - He, Jun - Liu, Zhinmin - Zhang, Xiaogang - Han, Buxing, Critical Parameters of Hexane + Carbon Monoxide + Hydrogen and Hexane + Methanol + Carbon Monoxide + Hydrogen Mixtures in the Hexane-Rich Region, Journal of Chemical & Engineering Data. 46 (2001) 1635-1637. doi:10.1021/je010146t

T / K	P / bar	x_1
505.40	30.09	0.0252
506.20	30.17	0.0155

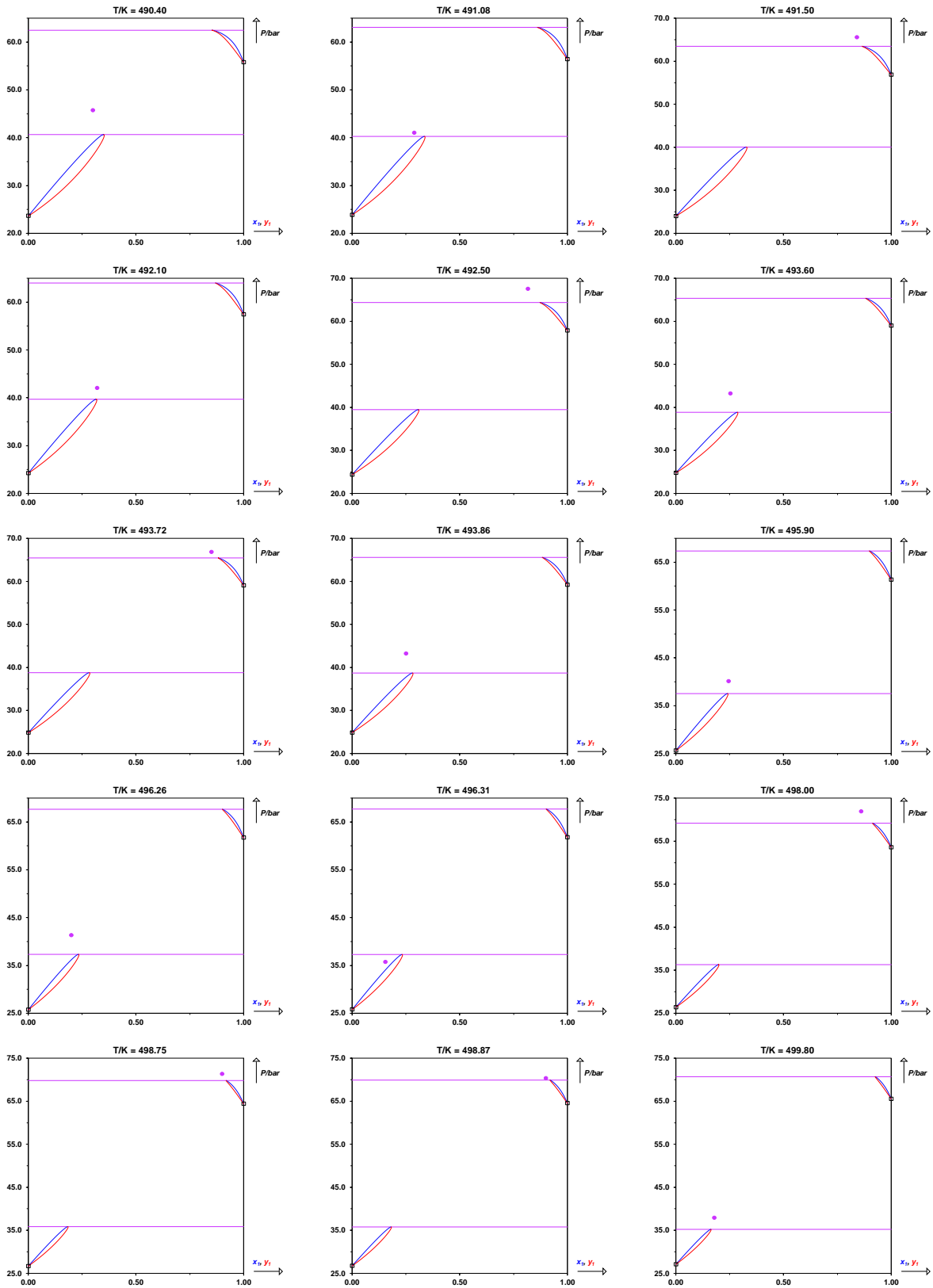
SA-NA systems (BAC = 5)



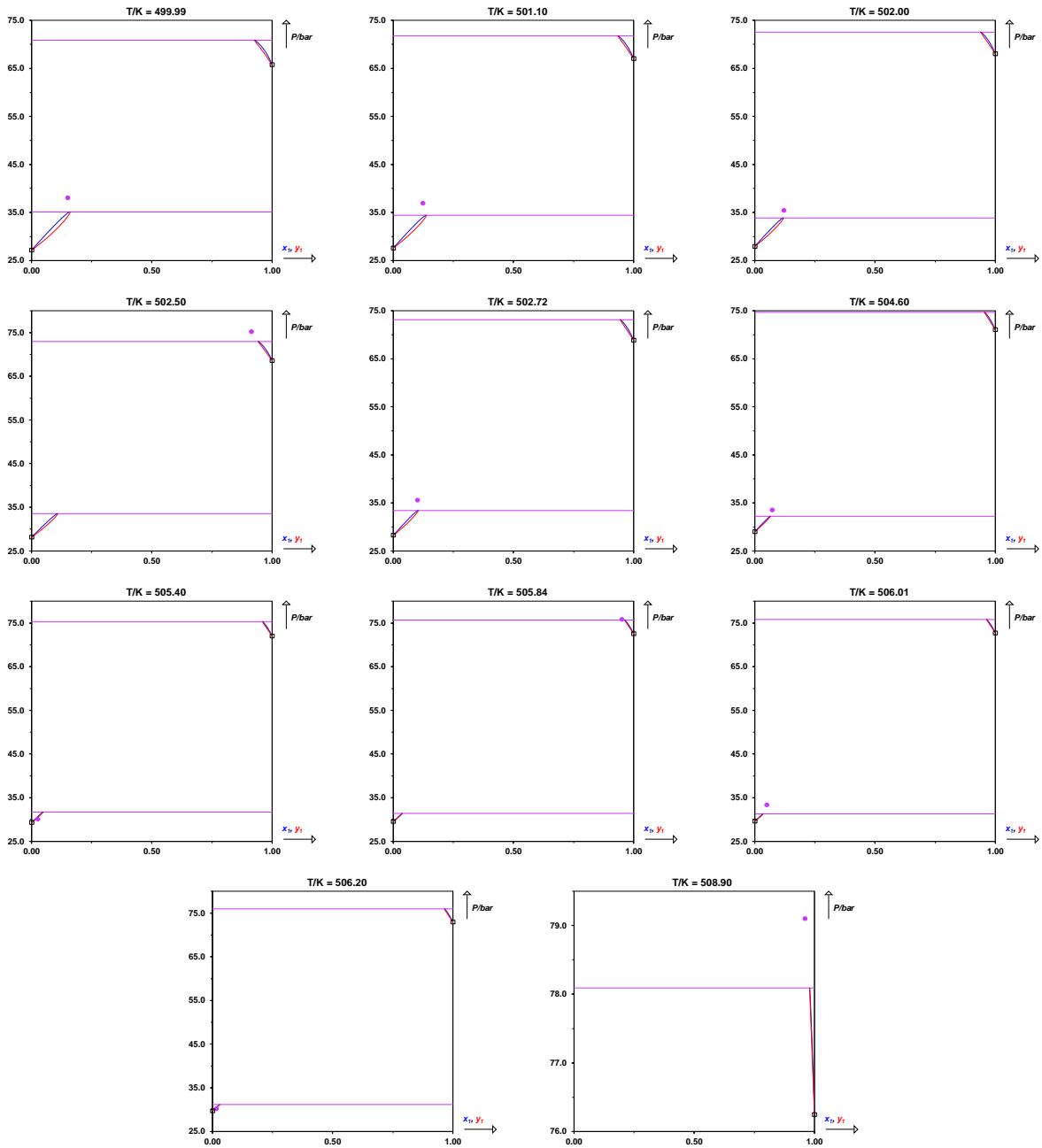
SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



ETHANOL (1) + BENZENE (2)

CAS	64-17-5	71-43-2
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	514.00	562.05
P_c / bar	61.37	48.95
ω	0.644	0.210

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 248.1$$

$$B/\text{MPa} = 465.8$$

Deviations

$$\text{MAPE on } x = 57\%$$

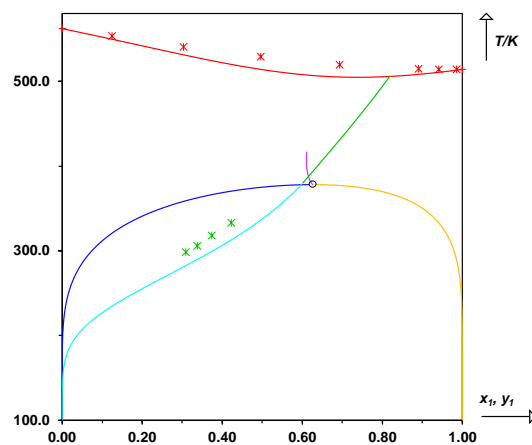
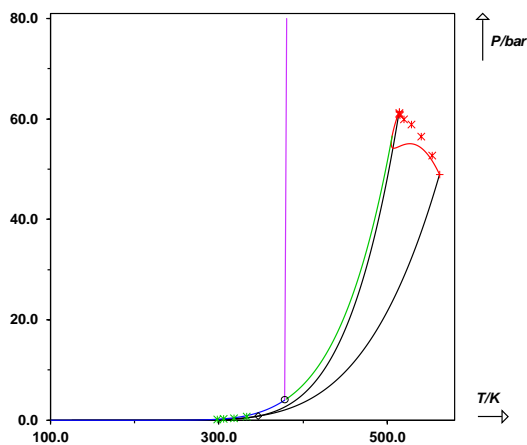
$$\text{MAPE on } y = 17\%$$

$$\text{MAPE on } x_c = 359\%$$

$$\text{MAPE on } P_c = 7.5\%$$

$$\text{MAPE on } h^M = 23\%$$

$$\text{MAPE on } c_p^M = 200\%$$



Isothermal phase equilibrium data				0.3400	0.8470	0.5850
Isothermal phase equilibrium data				0.2557	0.9760	0.9100
Iguchi, A., Vapor-liquid equilibriums at 25°C for binary systems between alcohols and hydrocarbons, Kagaku Sochi. 20 (1978) 66-68.				Zharov, V.T. - Morachevskii, A.G., Liquid-vapor equilibrium in the ethyl alcohol-benzene system and the verification of the thermodynamic data, Zh. Prikl. Khim. 36 (1963) 2397-2402.		
T / K =	298.15			T / K =	323.15	
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁
0.1605	0.1000	0.2490		0.4140	0.0210	0.1360
0.1640	0.2000	0.2830		0.4453	0.0480	0.2090
0.1647	0.3000	0.3100		0.4746	0.0850	0.2730
0.1647	0.3090	0.3090	AZEO	0.4973	0.1550	0.3260
0.1643	0.4000	0.3360		0.5046	0.2010	0.3430
0.1627	0.5000	0.3570		0.5113	0.5000	0.4210
0.1597	0.6000	0.3800		0.5026	0.5940	0.4480
0.1533	0.7000	0.4190		0.4853	0.7000	0.4870
0.1432	0.8000	0.4740		0.4546	0.8010	0.5570
0.1237	0.9000	0.5830		0.4346	0.8450	0.6040
Smith, Vinson C. - Robinson, Robert Louis, Vapor-Liquid Equilibria at 25°C in the Binary Mixtures Formed by Hexane, Benzene, and Ethanol, Journal of Chemical & Engineering Data. 15 (1970) 391-395. doi:10.1021/je60046a005				0.3973	0.9000	0.6860
T / K =	298.15			0.3533	0.9490	0.8000
P / bar	x ₁	y ₁		Fu, H. - Mo, X. - Han, S. - Li, H., Study on Isothermal Vapor-Liquid Equilibrium for Ethanol - Benzene, Chloroform - Benzene and Ethanol - Chloroform Binary Systems, Shiyou Xuebao Shiyou Jiagong. 11 (1995) 87-92.		
0.1616	0.1000	0.2600		T / K =	328.15	
0.1660	0.2000	0.3000		P / bar	x ₁	y ₁
0.1665	0.3000	0.3120		0.4426	0.0013	0.0166
0.1659	0.4000	0.3280		0.5597	0.0775	0.2677
0.1647	0.5000	0.3420		0.6015	0.1849	0.3449
0.1611	0.6000	0.3680		0.6127	0.2731	0.3610
0.1543	0.7000	0.4060		0.6169	0.2897	0.3804
0.1420	0.8000	0.4700		0.6202	0.4842	0.4305
0.1193	0.9000	0.6030		0.6132	0.5976	0.4529
Tamir, Abraham - Apelblat, Alexander - Wagner, Moshe, A new device for measuring isothermal vapor - liquid equilibria, Fluid Phase Equilibria. 6 (1981) 237-259. doi:10.1016/0378-3812(81)85007-8				0.6092	0.5997	0.4659
T / K =	318.15			0.5930	0.7000	0.4954
P / bar	x ₁	y ₁		0.5756	0.7624	0.5343
0.3522	0.0240	0.1250		0.5583	0.8080	0.5687
0.3950	0.0940	0.2650		0.5146	0.8791	0.6490
0.4113	0.2400	0.3450		0.4903	0.9023	0.6940
0.4129	0.3200	0.3560		0.4668	0.9277	0.7471
0.4134	0.3730	0.3730	AZEO	0.4184	0.9695	0.8608
0.4125	0.4200	0.3780		0.3748	0.9973	0.9899
0.4080	0.5460	0.4150		0.3737	0.9976	0.9940
0.3962	0.6650	0.4510		Fu, H. - Mo, X. - Han, S. - Li, H., Study on Isothermal Vapor-Liquid Equilibrium for Ethanol - Benzene, Chloroform - Benzene and Ethanol - Chloroform Binary Systems, Shiyou Xuebao Shiyou Jiagong. 11 (1995) 87-92.		
0.3813	0.7370	0.4850		T / K =	333.15	

SA-NA systems (BAC = 5)

P / bar	x ₁	y ₁				
			305.65	0.3380	0.3380	AZEO
0.5696	0.0144	0.0969	305.75	0.4000	0.3490	
0.6791	0.0786	0.2712	306.05	0.5000	0.3700	
0.7069	0.1144	0.3100	306.45	0.6000	0.3990	
0.7334	0.1866	0.3522	307.15	0.7000	0.4340	
0.7469	0.2496	0.3747	308.65	0.8000	0.5000	
0.7542	0.3691	0.4032	312.45	0.9000	0.6520	
0.7534	0.4110	0.4114				
0.7508	0.5105	0.4426				
0.7320	0.6531	0.4880				
0.7070	0.7401	0.5372				
0.6871	0.7866	0.5680				
0.6320	0.8697	0.6600				
0.6089	0.8986	0.6960				
0.5755	0.9272	0.7638				
0.5577	0.9413	0.7963				
0.4923	0.9858	0.9387				
0.4802	0.9927	0.9675				

Zharov, V.T. - Morachevskii, A.G., Liquid-vapor equilibrium in the ethyl alcohol-benzene system and the verification of the thermodynamic data, Zh. Prikl. Khim. 36 (1963) 2397-2402.

P / bar = 0.5999

T / K	x ₁	y ₁
328.15	0.1550	0.3340
327.25	0.3000	0.3900
327.35	0.5000	0.4300
328.55	0.7000	0.5070
331.15	0.8450	0.6250

Udovenko, V.V. - Fatkulina, L.G., Vapor pressure of three-component systems. I. The system ethyl alcohol-1,2-dichloroethane-benzene, Zh. Fiz. Khim. 26 (1952) 719-730.

T / K = 333.15

P / bar	x ₁	y ₁	
0.6036	0.0260	0.1610	
0.6909	0.0800	0.3100	
0.7382	0.1850	0.3750	
0.7533	0.3220	0.4080	
0.7573	0.3980	0.4200	
0.7575	0.4230	0.4230	AZEO
0.7554	0.4840	0.4360	
0.7501	0.5680	0.4550	
0.7315	0.6800	0.4900	
0.6989	0.7710	0.5370	
0.6466	0.8590	0.6250	
0.5754	0.9290	0.7470	
0.5032	0.9810	0.9040	

Zharov, V.T. - Morachevskii, A.G., Liquid-vapor equilibrium in the ethyl alcohol-benzene system and the verification of the thermodynamic data, Zh. Prikl. Khim. 36 (1963) 2397-2402.

P / bar = 0.7999

T / K	x ₁	y ₁
335.85	0.1550	0.3450
334.75	0.3000	0.4010
334.77	0.5000	0.4490
335.85	0.7000	0.5260
338.50	0.8450	0.6520

Wang, Q. - Chen, G. - Han, S., Study on the Vapor-Liquid Equilibria under Pressure for Binary Systems, Ranliao Huaxue Xuebao. 18 (1990) 185-192.

P / bar = 1.013

T / K	x ₁	y ₁
352.25	0.0029	0.0256
349.79	0.0177	0.1070
347.31	0.0440	0.1837
343.65	0.1061	0.2973
341.64	0.2124	0.3720
340.97	0.3661	0.4252
340.92	0.4641	0.4511
340.97	0.5666	0.4836
341.26	0.6394	0.5091
342.34	0.7536	0.5753
343.52	0.8095	0.6216
346.33	0.9111	0.7555
348.53	0.9570	0.8639
349.42	0.9729	0.9053

Isobaric phase equilibrium data

Nielsen, R. L. - Weber, J. H., Vapor-Liquid Equilibria at Subatmospheric Pressures. Binary and Ternary Systems Containing Ethyl Alcohol, Benzene, and n-Heptane., Journal of Chemical & Engineering Data. 4 (1959) 145-151. doi:10.1021/je60002a011

P / bar = 0.2400

T / K	x ₁	y ₁
306.75	0.1000	0.2770
305.95	0.2000	0.3140

SA-NA systems (BAC = 5)

350.76	0.9907	0.9714	$h^M / J.mol^{-1}$	x_1
			5.401	0.0003
			10.70	0.0007
			15.77	0.0010
			20.84	0.0013
			25.70	0.0017
			30.53	0.0020
			39.81	0.0026
			48.71	0.0032
			57.20	0.0038
			65.29	0.0043
			80.59	0.0054
			94.55	0.0064
			107.25	0.0074
			115.81	0.0082
			119.13	0.0083
			129.78	0.0091
			189.33	0.0146
			241.80	0.0204
			310.09	0.0304
			361.92	0.0402

Enthalpy of mixing

Cen, P. - Zhu, Z., The Measurement of Mixing Heat and the Prediction of Vapor-Liquid Equilibrium Data for Hydrocarbon - Alcohol Systems, Huagong Xuebao. 35 (1984) 51-65.

T / K = 283.15
P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$	x_1
387.70	0.0616
499.70	0.1304
569.50	0.2006
602.60	0.2629
609.70	0.3225
600.60	0.3794
570.20	0.4361
525.90	0.5033
482.20	0.5688
426.30	0.6319
366.20	0.6900
307.30	0.7460
254.50	0.7862
210.30	0.8350
163.00	0.8625
75.40	0.9356

Stokes, R.H. - Burfitt, Carol, Enthalpies of dilution and transfer of ethanol in non-polar solvents, The Journal of Chemical Thermodynamics. 5 (1973) 623-631. doi:10.1016/S0021-9614(73)80003-5

T / K = 283.15
P / bar = UNKNOWN (1.0132)

Cen, P. - Zhu, Z., The Measurement of Mixing Heat and the Prediction of Vapor-Liquid Equilibrium Data for Hydrocarbon - Alcohol Systems, Huagong Xuebao. 35 (1984) 51-65.

T / K = 288.15
P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$	x_1
427.80	0.0616
572.80	0.1304
650.70	0.2006
693.10	0.2629
706.60	0.3225
701.70	0.3794
661.00	0.4361
606.10	0.5033
556.10	0.5688
490.40	0.6319
422.60	0.6900
349.60	0.7460
295.40	0.7862
238.10	0.8350
193.20	0.8625
89.10	0.9356

Zhao, J. - Dai, M., Studies on Thermodynamic Properties of Binary Systems containing Alcohols. I. Excess Enthalpies of C1 to C5 Normal Alcohols + Benzene, Wuli Huaxue Xuebao. 2 (1986) 141-145.

T / K = 298.15

SA-NA systems (BAC = 5)

P / bar =	1.013	347.07	0.8155
$h^M / \text{J.mol}^{-1}$	z_1	280.57	0.8501
703.50	0.0889	214.27	0.8840
773.50	0.1144	144.04	0.9214
851.40	0.1630	60.77	0.9650
875.90	0.1869		
887.00	0.2103		
900.70	0.2560		
901.40	0.2782		
901.40	0.3001		
897.70	0.3217		
883.70	0.3637		
857.90	0.4044		
831.90	0.4438		
782.40	0.5006		
728.10	0.5549		
664.50	0.6068		
598.10	0.6565		
526.70	0.7041		
459.40	0.7497		
389.20	0.7935		
320.50	0.8355		
250.20	0.8759		
179.60	0.9148		
Yan, Wei-Dong - Lin, Rui-Sen - Yen, Wen-Hsing, Excess enthalpies of seven binary liquid systems, <i>Thermochimica Acta.</i> 169 (1990) 171-184. doi:10.1016/0040-6031(90)80143-M			
T / K =	303.15		
P / bar =	UNKNOWN (1.0132)		
$h^M / \text{J.mol}^{-1}$	x_1		
228.85	0.0110		
641.20	0.0793		
841.36	0.1618		
906.66	0.2349		
927.63	0.2961		
919.71	0.3483		
900.44	0.3954		
875.32	0.4339		
847.22	0.4677		
702.66	0.6089		
684.40	0.6213		
654.28	0.6406		
621.34	0.6606		
579.55	0.6845		
546.60	0.7058		
502.31	0.7307		
454.93	0.7576		
402.34	0.7860		
Missopolinou, Doukeni - Tsvintzelis, Ioannis - Panayiotou, Costas, Excess enthalpies of binary mixtures of 2-ethoxyethanol with four hydrocarbons at 298.15, 308.15, and 318.15K, <i>Fluid Phase Equilibria.</i> 245 (2006) 89-101. doi:10.1016/j.fluid.2006.04.016			
T / K =	308.15		
P / bar =	UNKNOWN (1.0132)		
$h^M / \text{J.mol}^{-1}$	x_1		
585.20	0.0640		
771.40	0.1049		
843.60	0.1248		
868.20	0.1542		
959.10	0.1828		
1003.1	0.2381		
1013.8	0.2908		
1021.8	0.3413		
1001.9	0.3895		
958.20	0.4357		
960.40	0.4357		
958.10	0.4506		
931.60	0.4799		
871.70	0.5224		
833.20	0.5631		
769.30	0.6023		
640.80	0.6761		
519.70	0.7447		
396.00	0.8084		
277.10	0.8678		
Stokes, R.H. - Burfitt, Carol, Enthalpies of dilution and transfer of ethanol in non-polar solvents, <i>The Journal of Chemical Thermodynamics.</i> 5 (1973) 623-631. doi:10.1016/S0021-9614(73)80003-5			
T / K =	318.15		
P / bar =	UNKNOWN (1.0132)		
$h^M / \text{J.mol}^{-1}$	x_1		
6.418	0.0004		
11.73	0.0008		
17.02	0.0011		
22.12	0.0014		
27.05	0.0017		
31.95	0.0021		
42.27	0.0027		
51.40	0.0033		
68.68	0.0045		

SA-NA systems (BAC = 5)

84.87	0.0056	4.197	0.8755
99.80	0.0066	3.917	0.9097
113.74	0.0075		
124.51	0.0082		
126.81	0.0084		
139.01	0.0093		
209.91	0.0144		
288.14	0.0205		
402.54	0.0306		
496.62	0.0404		
Missopolinou, Doukeni - Tsivintzelis, Ioannis - Panayiotou, Costas, Excess enthalpies of binary mixtures of 2-ethoxyethanol with four hydrocarbons at 298.15, 308.15, and 318.15K, Fluid Phase Equilibria. 245 (2006) 89-101. doi:10.1016/j.fluid.2006.04.016		Tanaka, Reiji - Toyama, Satoru, Excess Molar Volumes and Excess Molar Heat Capacities for Binary Mixtures of (Ethanol + Benzene, or Toluene, or o-Xylene, or Chlorobenzene) at a Temperature of 298.15 K, Journal of Chemical & Engineering Data. 42 (1997) 871-874. doi:10.1021/je9700479	
T / K = 318.15		T / K = 298.15	
P / bar = UNKNOWN (1.0132)		P / bar = UNKNOWN (1.0132)	
$h^M / \text{J.mol}^{-1}$	x_1	$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
628.50	0.0640	0.0083	0.0021
932.70	0.1248	0.0039	0.0041
1077.9	0.1828	0.0856	0.0060
1134.6	0.2381	0.1410	0.0076
1176.6	0.2908	0.2157	0.0092
1174.2	0.3413	0.3620	0.0117
1160.3	0.3895	1.640	0.0233
1080.9	0.4799	3.360	0.0355
967.40	0.5631	3.950	0.0400
902.50	0.6023	5.930	0.0573
771.90	0.6761	7.590	0.0767
629.60	0.7447	9.110	0.0996
484.10	0.8084	10.59	0.1303
337.70	0.8678	11.53	0.1557
185.20	0.9233	13.97	0.2903
		14.51	0.3659
		13.80	0.4797
		12.27	0.5826
		9.770	0.6959
		7.170	0.7891
		3.600	0.8988

Heat capacity of mixing

Perrakis, N., The physical properties of liquid double mixtures in the neighborhood of the critical state of miscibility, J. Chim. Phys. 22 (1925) 280-305.

T / K = 293.15
P / bar = UNKNOWN (1.0132)

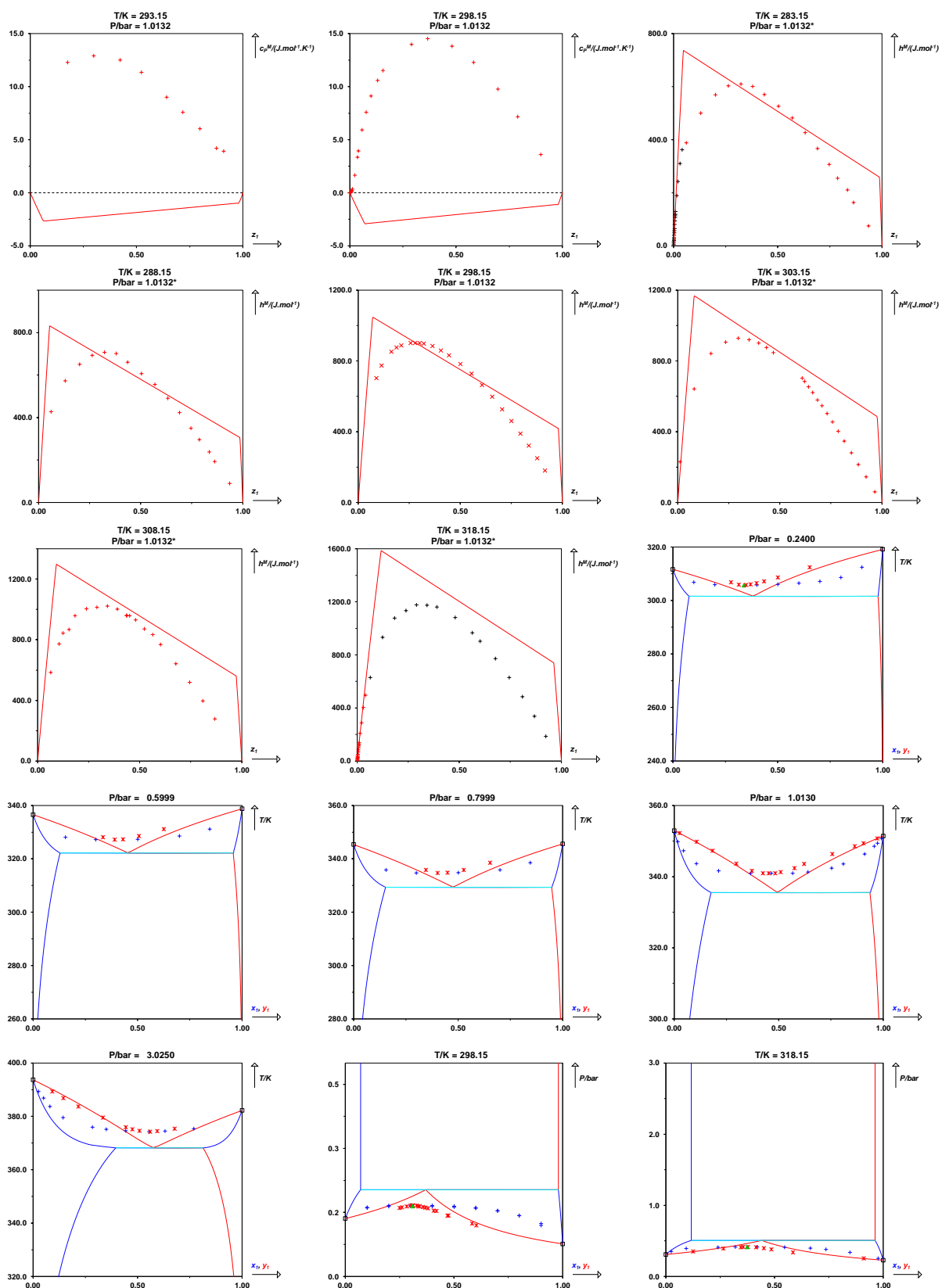
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
12.28	0.1759
12.90	0.2977
12.50	0.4222
11.34	0.5229
9.000	0.6409
7.601	0.7178
6.040	0.7982

Critical point

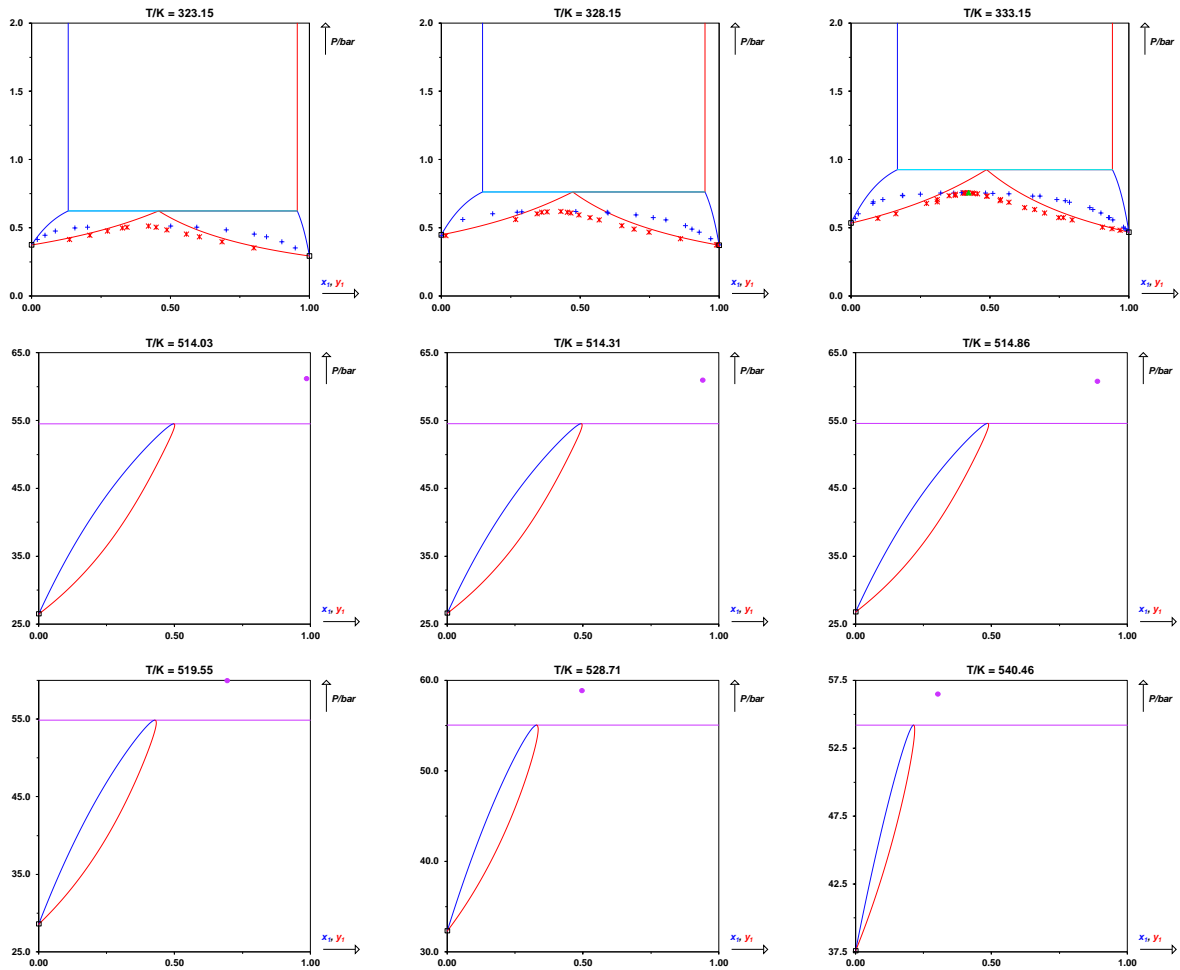
Skaates, J.M. - Kay, W.B., The phase relations of binary systems that form azeotropes, Chemical Engineering Science. 19 (1964) 431-444. doi:10.1016/0009-2509(64)85070-3

T / K	P / bar	x_1
514.03	61.16	0.9860
514.31	60.94	0.9410
514.86	60.74	0.8900
519.55	59.93	0.6932
528.71	58.83	0.4954
540.46	56.49	0.3025
553.13	52.73	0.1250

SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



ETHANOL (1) + n-HEPTANE (2)

CAS	64-17-5	142-82-5
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	IMNFDUFMRHMDMM-UHFFFAOYSA-N
T_c / K	514.00	540.20
P_c / bar	61.37	27.40
ω	0.644	0.349

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 261.7$$

$$B/\text{MPa} = 616.0$$

Deviations

$$\text{MAPE on } x = 45 \%$$

$$\text{MAPE on } y = 8.8 \%$$

$$\text{MAPE on } x_c = 14 \%$$

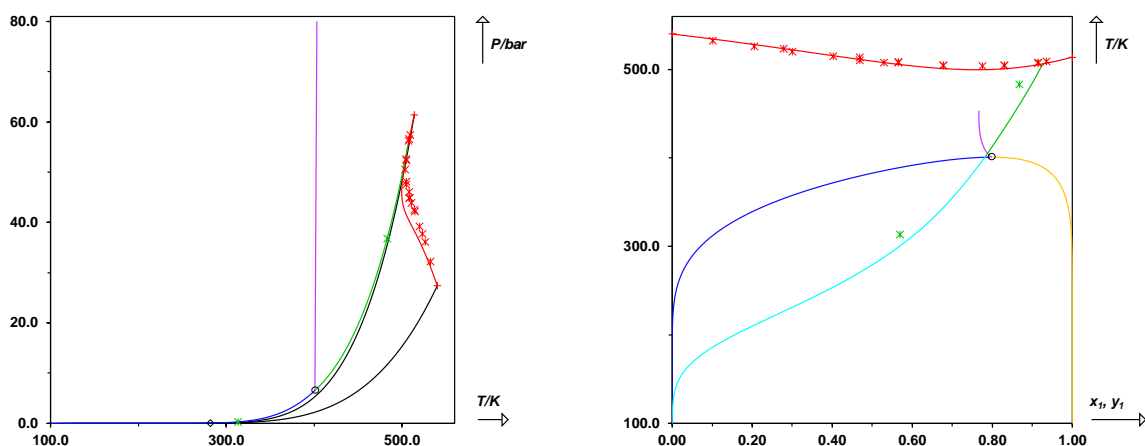
$$\text{MAPE on } P_c = 6.7 \%$$

$$\text{MAPE on } x_{az} = 13 \%$$

$$\text{MAPE on } P_{az} = 0.06 \%$$

$$\text{MAPE on } h^M = 47 \%$$

$$\text{MAPE on } c_p^M = 200 \%$$



Isothermal phase equilibrium data					
-----			0.1264	0.9693	0.8131
Isothermal phase equilibrium data			0.1215	0.9774	0.8489
-----			0.1192	0.9814	0.8694
Berro, Charles - Rogalski, Marek - Pénélox, André, A new ebulliometric technique. Vapour-liquid equilibria in the binary systems ethanol-n-heptane and ethanol-n-nonane, Fluid Phase Equilibria. 8 (1982) 55-73. doi:10.1016/0378-3812(82)80005-8			0.1146	0.9880	0.9081
T / K =			0.1108	0.9932	0.9440
			0.1088	0.9956	0.9624
P / bar	x₁	y₁	0.1072	0.9979	0.9814
0.1398	0.0383	0.4488	0.1064	0.9988	0.9892
0.1428	0.0472	0.4622	0.1056	0.9996	0.9964
0.1447	0.0542	0.4699	Ratcliff, G. A. - Chao, K. C., Prediction of thermodynamic properties of polar mixtures by a group solution model, The Canadian Journal of Chemical Engineering. 47 (1969) 148-153. doi:10.1002/cjce.5450470208		
0.1465	0.0614	0.4763	T / K =	313.15	
0.1492	0.0776	0.4879	P / bar	x₁	y₁
0.1534	0.1087	0.5048	0.2128	0.0352	0.4392
0.1561	0.1385	0.5169	0.2324	0.0717	0.4744
0.1578	0.1577	0.5228	0.2488	0.1451	0.5235
0.1587	0.1749	0.5268	0.2612	0.3327	0.5524
0.1593	0.1900	0.5296	0.2639	0.5620	0.5680
0.1600	0.2212	0.5337	0.2640	0.5700	0.5700
0.1606	0.2435	0.5357	0.2615	0.7262	0.5885
0.1610	0.2733	0.5379	0.2611	0.7586	0.5986
0.1612	0.3032	0.5399	0.2420	0.8786	0.6553
0.1614	0.3206	0.5411	0.2275	0.9175	0.7082
0.1615	0.3292	0.5417	0.2080	0.9615	0.8017
0.1617	0.3422	0.5426	Diaz Pena, M. - Rodriguez Cheda, D.R., Liquid-vapor equilibrium. II. Ethanol-n-heptane system at 40 and 60.deg., An. Quim. 66 (1970) 737-745.		
0.1616	0.3589	0.5437	T / K =	313.15	
0.1621	0.3858	0.5455	P / bar	x₁	y₁
0.1620	0.3947	0.5461	0.2054	0.0277	0.4079
0.1622	0.4287	0.5482	0.2619	0.2905	0.5314
0.1624	0.4646	0.5501	0.2615	0.3809	0.5410
0.1626	0.5127	0.5526	0.2632	0.5052	0.5607
0.1627	0.5476	0.5546	0.2643	0.5565	0.5740
0.1626	0.5688	0.5561	0.2641	0.6413	0.5967
0.1624	0.5767	0.5567	0.2636	0.7055	0.6055
0.1623	0.5998	0.5586	0.2604	0.7943	0.6296
0.1623	0.6178	0.5602	0.2571	0.8357	0.6424
0.1624	0.6199	0.5604	0.2529	0.8802	0.6615
0.1623	0.6361	0.5621	0.2443	0.9191	0.6925
0.1622	0.6554	0.5643	0.2125	0.9724	0.8143
0.1618	0.7008	0.5703	0.1857	0.9949	0.9563
0.1615	0.7122	0.5721	Diaz Pena, M. - Rodriguez Cheda, D.R., Liquid-vapor equilibrium. II. Ethanol-n-heptane system at 40 and 60.deg., An. Quim. 66 (1970) 737-745.		
0.1606	0.7558	0.5804	T / K =	333.15	
0.1587	0.8086	0.5959			
0.1561	0.8467	0.6142			
0.1497	0.8950	0.6538			
0.1418	0.9288	0.7023			
0.1389	0.9389	0.7226			
0.1317	0.9581	0.7731			

SA-NA systems (BAC = 5)

P / bar	x ₁	y ₁	0.8825	0.9259	0.7767	
0.4472	0.0302	0.3741	0.8083	0.9710	0.8742	
0.6236	0.1564	0.5686	0.7909	0.9788	0.9001	
0.6320	0.2817	0.5819	0.7517	0.9922	0.9569	
0.6383	0.3835	0.5875	0.7422	0.9950	0.9713	
0.6454	0.5405	0.6152	0.7351	0.9968	0.9812	
0.6476	0.6356	0.6253				
0.6451	0.7060	0.6395	Seo, Jungha - Lee, Jongcheon - Kim, Hwayong,			
0.6403	0.7719	0.6558	Measurement and Correlation of Vapor-Liquid Equilibria			
0.6300	0.8390	0.6799	for the 2-Propanol + n-Hexane System near the Critical			
0.6183	0.8750	0.7001	Region, Journal of Chemical & Engineering Data. 48 (2003)			
0.5988	0.9116	0.7369	856-859. doi:10.1021/je025604s			
0.5767	0.9401	0.7802	T / K =	483.15		
0.5382	0.9672	0.8464	P / bar	x ₁	y ₁	
0.5060	0.9847	0.9150	17.20	0.1040	0.2070	
			22.39	0.2150	0.3560	
			25.99	0.3150	0.4540	
			30.80	0.4670	0.5890	
			34.21	0.6180	0.6860	
			35.72	0.7350	0.7730	
			36.47	0.8220	0.8250	
			36.77	0.8670	0.8670	AZEO
			36.55	0.9490	0.9410	
			Seo, Jungha - Lee, Jongcheon - Kim, Hwayong,			
			Measurement and Correlation of Vapor-Liquid Equilibria			
			for the 2-Propanol + n-Hexane System near the Critical			
			Region, Journal of Chemical & Engineering Data. 48 (2003)			
			856-859. doi:10.1021/je025604s			
			T / K =	508.15		
			P / bar	x ₁	y ₁	
			26.17	0.1410	0.2470	
			34.21	0.2870	0.4090	
			38.71	0.3790	0.4760	
			40.83	0.4220	0.5080	
			43.84	0.5000	0.5350	
			44.64	0.5250	0.5380	
			44.80	0.5290	0.5290	CRIT
			56.58	0.9150	0.9150	CRIT
			56.55	0.9190	0.9160	
			56.49	0.9270	0.9240	
			56.10	0.9730	0.9700	
			Seo, Jungha - Lee, Jongcheon - Kim, Hwayong,			
			Measurement and Correlation of Vapor-Liquid Equilibria			
			for the 2-Propanol + n-Hexane System near the Critical			
			Region, Journal of Chemical & Engineering Data. 48 (2003)			
			856-859. doi:10.1021/je025604s			
			T / K =	523.15		
			P / bar	x ₁	y ₁	
			27.95	0.0900	0.1480	
			34.90	0.2020	0.2700	

Berro, Charles - Rogalski, Marek - Pénéloux, André, A new ebulliometric technique. Vapour-liquid equilibria in the binary systems ethanol-n-heptane and ethanol-n-nonane, Fluid Phase Equilibria. 8 (1982) 55-73. doi:10.1016/0378-3812(82)80005-8

T / K = **343.17**

P / bar	x ₁	y ₁
0.8387	0.0976	0.5344
0.8443	0.1013	0.5371
0.8877	0.1510	0.5655
0.8964	0.1666	0.5710
0.9104	0.1957	0.5807
0.9237	0.2344	0.5898
0.9294	0.2547	0.5943
0.9393	0.3003	0.6018
0.9415	0.3161	0.6043
0.9463	0.3419	0.6078
0.9467	0.3483	0.6089
0.9552	0.4248	0.6173
0.9561	0.4303	0.6182
0.9590	0.4698	0.6227
0.9599	0.4904	0.6241
0.9607	0.5046	0.6264
0.9618	0.5288	0.6282
0.9621	0.5356	0.6298
0.9633	0.5671	0.6326
0.9650	0.6116	0.6381
0.9643	0.6524	0.6436
0.9628	0.7116	0.6542
0.9607	0.7420	0.6613
0.9554	0.7835	0.6735
0.9498	0.8101	0.6833
0.9418	0.8403	0.6985
0.9209	0.8815	0.7267

37.72 0.2790 0.2790 CRIT

Isobaric phase equilibrium data

Van Ness, Hendrick C. - Soczek, C. A. - Kochar, Nand K.,
Thermodynamic excess properties for ethanol-n-heptane,
Journal of Chemical & Engineering Data. 12 (1967) 346-
351. doi:10.1021/je60034a015

P / bar = 1.013

T / K	x ₁	y ₁
365.22	0.0100	0.1669
358.19	0.0250	0.3371
351.96	0.0500	0.4667
349.45	0.0750	0.5110
348.16	0.1000	0.5396
345.77	0.2000	0.5853
344.99	0.3000	0.6029
344.64	0.4000	0.6140
344.43	0.5000	0.6250
344.37	0.6000	0.6302
344.40	0.7000	0.6495
344.72	0.8000	0.6834
345.80	0.9000	0.7449
347.46	0.9500	0.8214
348.93	0.9750	0.8869

Kao, Chien-Ping Chai - Miller, Ralph N. - Sturgis, James F.,
Double Azeotropy in Binary Mixtures 1,1,1,2,3,4,4,5,5,5-
Decafluoropentane + Tetrahydrofuran, Journal of
Chemical & Engineering Data. 46 (2001) 229-233.
doi:10.1021/je000212b

P / bar = 5.068

T / K	x ₁	y ₁
428.16	0.0258	0.1679
421.91	0.0557	0.2715
417.70	0.0724	0.3349
408.72	0.1235	0.4695
400.80	0.2103	0.5773
396.65	0.3343	0.6373
394.58	0.4640	0.6717
394.27	0.5285	0.6930
393.72	0.6612	0.7201
393.53	0.7139	0.7363
393.56	0.7818	0.7601
394.93	0.9202	0.8568
395.83	0.9488	0.8978
398.09	0.9906	0.9783

Kao, Chien-Ping Chai - Miller, Ralph N. - Sturgis, James F.,
Double Azeotropy in Binary Mixtures 1,1,1,2,3,4,4,5,5,5-

Decafluoropentane + Tetrahydrofuran, Journal of
Chemical & Engineering Data. 46 (2001) 229-233.
doi:10.1021/je000212b

P / bar = 7.093

T / K	x ₁	y ₁
424.66	0.1348	0.4599
417.16	0.1960	0.5599
414.06	0.2402	0.6040
409.33	0.3596	0.6585
408.46	0.4136	0.6782
406.66	0.5668	0.7099
406.35	0.6108	0.7216
405.97	0.7262	0.7512
406.03	0.8311	0.7982
407.46	0.9288	0.8800

Kao, Chien-Ping Chai - Miller, Ralph N. - Sturgis, James F.,
Double Azeotropy in Binary Mixtures 1,1,1,2,3,4,4,5,5,5-
Decafluoropentane + Tetrahydrofuran, Journal of
Chemical & Engineering Data. 46 (2001) 229-233.
doi:10.1021/je000212b

P / bar = 8.106

T / K	x ₁	y ₁
452.07	0.0314	0.1646
442.38	0.0751	0.3059
433.65	0.1292	0.4198
426.44	0.1990	0.5288
420.63	0.2732	0.6012
416.97	0.3347	0.6499
414.28	0.4245	0.6815
412.10	0.5640	0.7090
411.62	0.6369	0.7315
411.12	0.7528	0.7688
411.15	0.8084	0.7917
411.85	0.8992	0.8571
412.59	0.9356	0.8940
414.23	0.9714	0.9464

Enthalpy of mixing

Lietzmann, Andreas - Loewen, Burkhard - Schulz,
Siegfried, Excess Molar Enthalpies of Propanone +
Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-
Propanol + Water at 283.15, 298.15, 323.15, 343.15, and
363.15 K, Journal of Chemical & Engineering Data. 39
(1994) 785-788. doi:10.1021/je00016a033

T / K = 283.15**P / bar = 4.000**

h ^M / J.mol ⁻¹	z ₁
225.50	0.0530
289.60	0.1020

SA-NA systems (BAC = 5)

351.80	0.1520	638.70	0.5373
381.60	0.1930	613.90	0.5858
412.20	0.2470	565.80	0.6562
433.50	0.2950	443.70	0.7779
446.80	0.3530	348.10	0.8468
451.20	0.3960	253.40	0.8998
453.40	0.4440	131.60	0.9540
456.20	0.5010	25.60	0.9916
434.30	0.5560		
420.60	0.6130		
410.30	0.6530		
386.00	0.7010		
364.80	0.7530		
321.90	0.8070		
275.90	0.8520		
212.90	0.9000		
122.40	0.9500		
Grosse-Wortmann, H. - Jost, W. - Wagner, H. Gg., Kalorimetrische Messungen am System Äthanol - Cyclohexan - n-Heptan, Zeitschrift für Physikalische Chemie. 49 (1966) 74-93. doi:10.1524/zpch.1966.49.1_2.074		Mier, W. - Oswald, G. - Tusel-Langer, E. - Lichtenthaler, R.N., Excess Enthalpy HE of Binary Mixtures Containing Alkanes, Ethanol and Ethyl-Tert. Butyl Ether (ETBE), Berichte der Bunsengesellschaft für physikalische Chemie. 99 (1995) 1123-1130. doi:10.1002/bbpc.199500043	
T / K =	293.15	T / K =	313.15
P / bar =	UNKNOWN (1.0132)	P / bar =	UNKNOWN (1.0132)
$h^M / J.mol^{-1}$	x_1	$h^M / J.mol^{-1}$	x_1
408.96	0.1085	404.00	0.0410
532.68	0.2619	650.00	0.1170
557.70	0.3301	772.00	0.2190
553.46	0.4932	828.00	0.3070
457.35	0.7020	833.00	0.3860
		809.00	0.4560
		788.00	0.5180
		685.00	0.6260
		585.00	0.7150
		485.00	0.7900
		433.00	0.8230
		171.00	0.9460
van Ness, H.C. - Abbott, M.M., Excess enthalpy. Ethanol (ethyl alcohol)-n-hexane system, Int. Data Ser. Sel. Data Mixtures Ser. A. 1976 (1976)		Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2- Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033	
T / K =	303.15	T / K =	323.15
P / bar =	2.100	P / bar =	4.000
$h^M / J.mol^{-1}$	z_1	$h^M / J.mol^{-1}$	z_1
186.40	0.0102	803.70	0.1020
225.60	0.0141	884.40	0.1520
267.60	0.0199	933.80	0.1930
312.40	0.0281	993.60	0.2470
398.40	0.0530	1005.9	0.2950
478.70	0.0894	1021.4	0.3530
547.50	0.1351	1017.7	0.3960
603.00	0.1882	1001.5	0.4440
639.60	0.2409	959.00	0.5010
663.40	0.2974	914.60	0.5560
674.20	0.3615	855.80	0.6130
672.10	0.4243		
659.70	0.4807		

799.70	0.6530	1882.0	0.3960
734.70	0.7010	1843.2	0.4440
665.20	0.7530	1773.4	0.5010
560.20	0.8070	1680.6	0.5560
455.10	0.8520	1565.3	0.6130
327.30	0.9000	1459.8	0.6530

Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033

T / K = 343.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1

822.70	0.0480
1141.4	0.1020
1262.1	0.1520
1335.5	0.1930
1423.9	0.2470
1443.7	0.2950
1471.2	0.3530
1453.3	0.3960
1436.3	0.4440
1373.4	0.5010
1314.3	0.5560
1224.4	0.6130
1148.1	0.6530
1050.4	0.7010
923.50	0.7530
771.20	0.8070
624.60	0.8520
448.80	0.9000
247.00	0.9480

Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033

T / K = 363.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$ z_1

1373.7	0.1020
1572.8	0.1520
1676.7	0.1930
1818.6	0.2470
1852.0	0.2950
1883.9	0.3530

1323.2	0.7010
1174.3	0.7530
971.00	0.8070
779.70	0.8520
551.70	0.9000

Heat capacity of mixing

Tanaka, Reiji - Toyama, Satoru - Murakami, Sachio, Heat capacities of $\{x\text{C}_n\text{H}_{2n+1}\text{OH} + (1-x)\text{C}_7\text{H}_{16}\}$ for $n = 1$ to 6 at 298.15 K, The Journal of Chemical Thermodynamics. 18 (1986) 63-73. doi:10.1016/0021-9614(86)90044-3

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

0.0020	0.0014
0.0070	0.0015
0.1100	0.0033
0.2800	0.0042
0.5700	0.0052
1.200	0.0067
1.780	0.0080
2.700	0.0103
2.820	0.0106
3.000	0.0111
4.140	0.0148
4.860	0.0180
5.050	0.0186
5.960	0.0246
6.510	0.0288
7.870	0.0433
8.690	0.0568
8.780	0.0569
9.110	0.0654
10.29	0.0968
10.25	0.0982
11.27	0.1474
11.94	0.1975
12.25	0.2943
11.85	0.3872
9.200	0.5963
6.840	0.7177
5.460	0.7793

SA-NA systems (BAC = 5)

2.770	0.8901	10.26	0.1007
		11.27	0.1506
Iguchi, A., Excess molal specific heat of nonelectrolyte solutions, Kagaku Sochi. 19 (1977) 64-65.		11.71	0.1875
T / K =	298.15	12.09	0.2997
P / bar =	UNKNOWN (1.0132)	11.52	0.4087
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1		10.54	0.5007
7.624	0.0418	9.828	0.5520
10.26	0.1007	9.047	0.6008
11.71	0.1875	8.252	0.6453
12.09	0.2997	7.104	0.7036
11.52	0.4087	4.899	0.8027
10.54	0.5007	2.435	0.9021
9.047	0.6008		
7.104	0.7036	Klesper, I., Messung der spezifischen Wärmen binärer Flüssigkeitsgemische, Zeitschrift für Physikalische Chemie. 51 (1966) 1-12. doi:10.1524/zpch.1966.51.1_2.001	
4.900	0.8027	T / K =	308.15
2.435	0.9021	P / bar =	UNKNOWN (1.0132)
		$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1	
Mier, W. - Lichtenthaler, R.N. - Roux, A.H. - Grolier, J.-P.E., Excess molar heat capacities $C_{E,m}$ and excess molar volumes $V_{E,m}$ of $\{x_1\text{CH}_3(\text{CH}_2)_5\text{CH}_3 + x_2\text{CH}_3\text{C}(\text{CH}_3)_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_3 + x_3\text{CH}_3\text{C}(\text{CH}_3)_2\text{OC}_2\text{H}_5 + (1 - x_1 - x_2 - x_3)\text{C}_2\text{H}_5\text{OH}\}(\text{l})$ I. Binary and quaternary mixtures, The Journal of Chemical Thermodynamics. 26 (1994) 1323-1334. doi:10.1006/jcht.1994.1151		6.236	0.0508
T / K =	298.15	13.30	0.1972
P / bar =	UNKNOWN (1.0132)	12.47	0.5105
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1		5.986	0.8010
7.481	0.0409		
9.019	0.0657	Klesper, I., Messung der spezifischen Wärmen binärer Flüssigkeitsgemische, Zeitschrift für Physikalische Chemie. 51 (1966) 1-12. doi:10.1524/zpch.1966.51.1_2.001	
11.45	0.1657	T / K =	318.15
12.06	0.2499	P / bar =	UNKNOWN (1.0132)
11.99	0.3365	$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1	
11.54	0.4165	7.400	0.0508
10.55	0.5046	15.88	0.1972
9.249	0.5933	15.22	0.5105
7.670	0.6811	7.566	0.8010
5.774	0.7697		
3.733	0.8540	Klesper, I., Messung der spezifischen Wärmen binärer Flüssigkeitsgemische, Zeitschrift für Physikalische Chemie. 51 (1966) 1-12. doi:10.1524/zpch.1966.51.1_2.001	
1.416	0.9443	T / K =	328.15
		P / bar =	UNKNOWN (1.0132)
Fortier, Jean-Luc - Benson, George C, Excess heat capacities of binary liquid mixtures determined with a Picker flow calorimeter, The Journal of Chemical Thermodynamics. 8 (1976) 411-423. doi:10.1016/0021-9614(76)90061-6		$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1	
T / K =	298.15	8.647	0.0508
P / bar =	UNKNOWN (1.0132)	18.46	0.1972
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1		18.13	0.5105
5.402	0.0216	9.229	0.8010
7.623	0.0418		
9.060	0.0661	Klesper, I., Messung der spezifischen Wärmen binärer Flüssigkeitsgemische, Zeitschrift für Physikalische	

Chemie.	51	(1966)	1-12.	520.00	39.22	0.3000
doi:10.1524/zpch.1966.51.1_2.001						
T / K =	338.15			526.20	36.08	0.2052
P / bar =	UNKNOWN (1.0132)			532.40	32.17	0.1014
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1					
9.977	0.0508					
21.04	0.1972					
21.20	0.5105					
11.14	0.8010					

Klesper, I., Messung der spezifischen Wärmen binärer Flüssigkeitsgemische, Zeitschrift für Physikalische Chemie.

51 (1966) 1-12.

doi:10.1524/zpch.1966.51.1_2.001

T / K = 343.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

10.73 0.0508

22.28 0.1972

22.86 0.5105

12.06 0.8010

Critical point

Soo, Chien-Bin - Théveneau, Pascal - Coquelet, Christophe - Ramjugernath, Deresh - Richon, Dominique, Determination of critical properties of pure and multi-component mixtures using a "dynamic-synthetic" apparatus, The Journal of Supercritical Fluids. 55 (2010) 545-553. doi:10.1016/j.supflu.2010.10.022

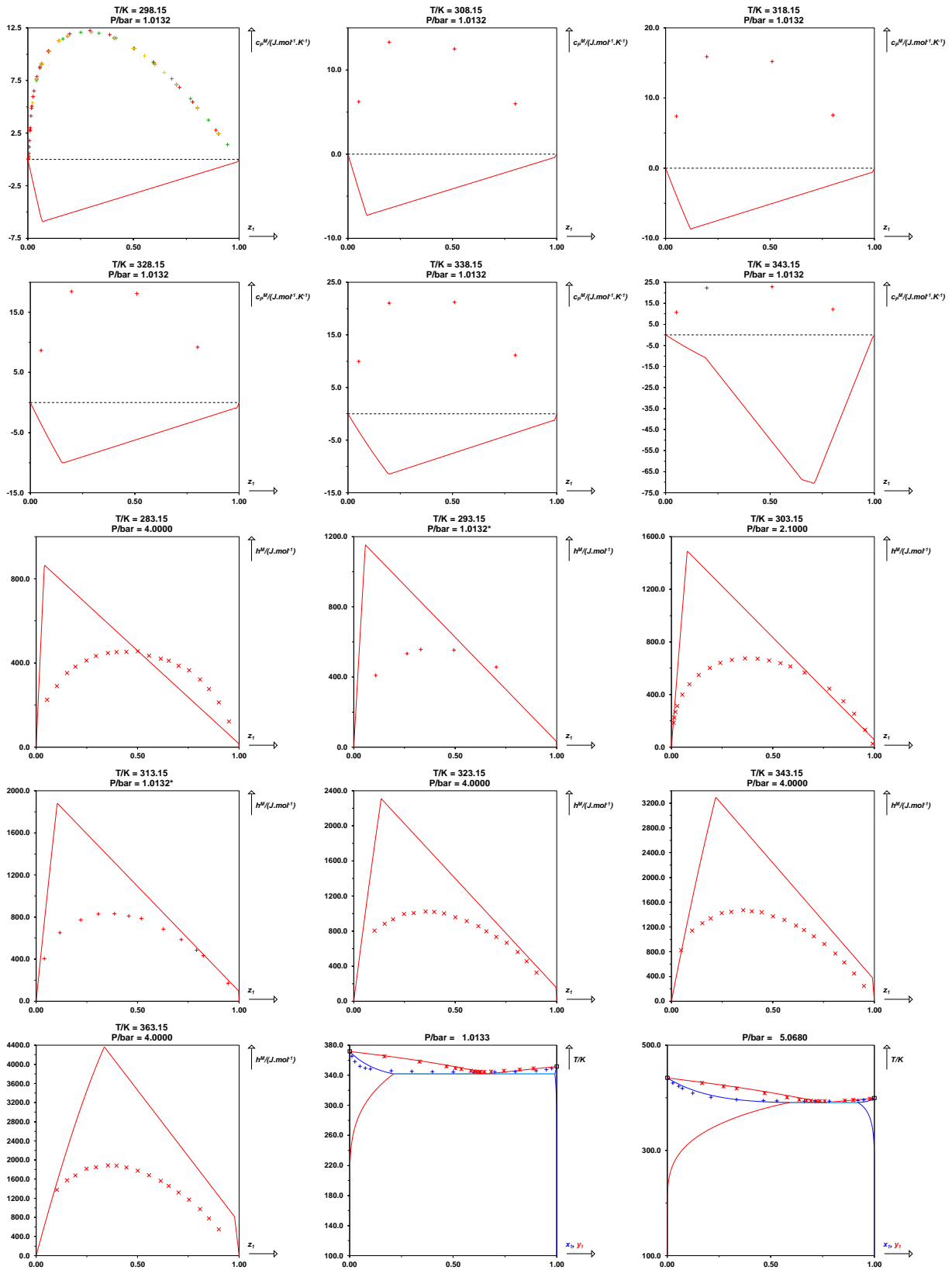
T / K	P / bar	x_1
503.82	50.50	0.7757
504.67	47.60	0.6768
504.75	52.39	0.8303
508.59	44.95	0.5656
509.28	57.35	0.9348
513.83	42.49	0.4679

Wang, Lipu - Han, Kewei - Xia, Shuqian - Ma, Peisheng - Yan, Fangyou, Measurement and correlation of critical properties for binary mixtures and ternary mixtures containing gasoline additives, The Journal of Chemical Thermodynamics. 74 (2014) 161-168.

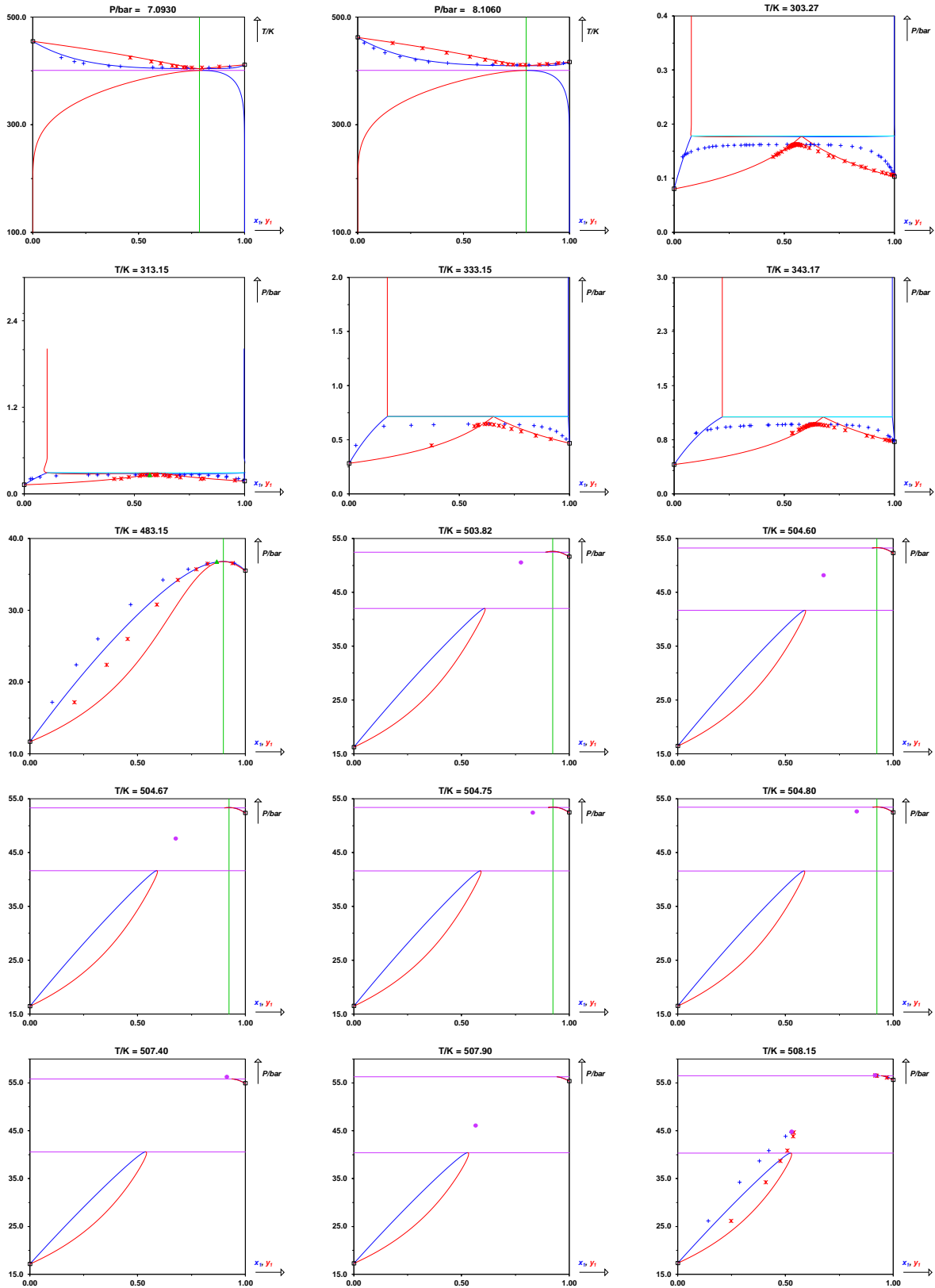
doi:10.1016/j.jct.2014.01.025

T / K	P / bar	x_1
504.60	48.17	0.6770
504.80	52.60	0.8305
507.40	56.23	0.9136
507.90	46.04	0.5651
510.60	43.91	0.4687
514.70	42.17	0.4018

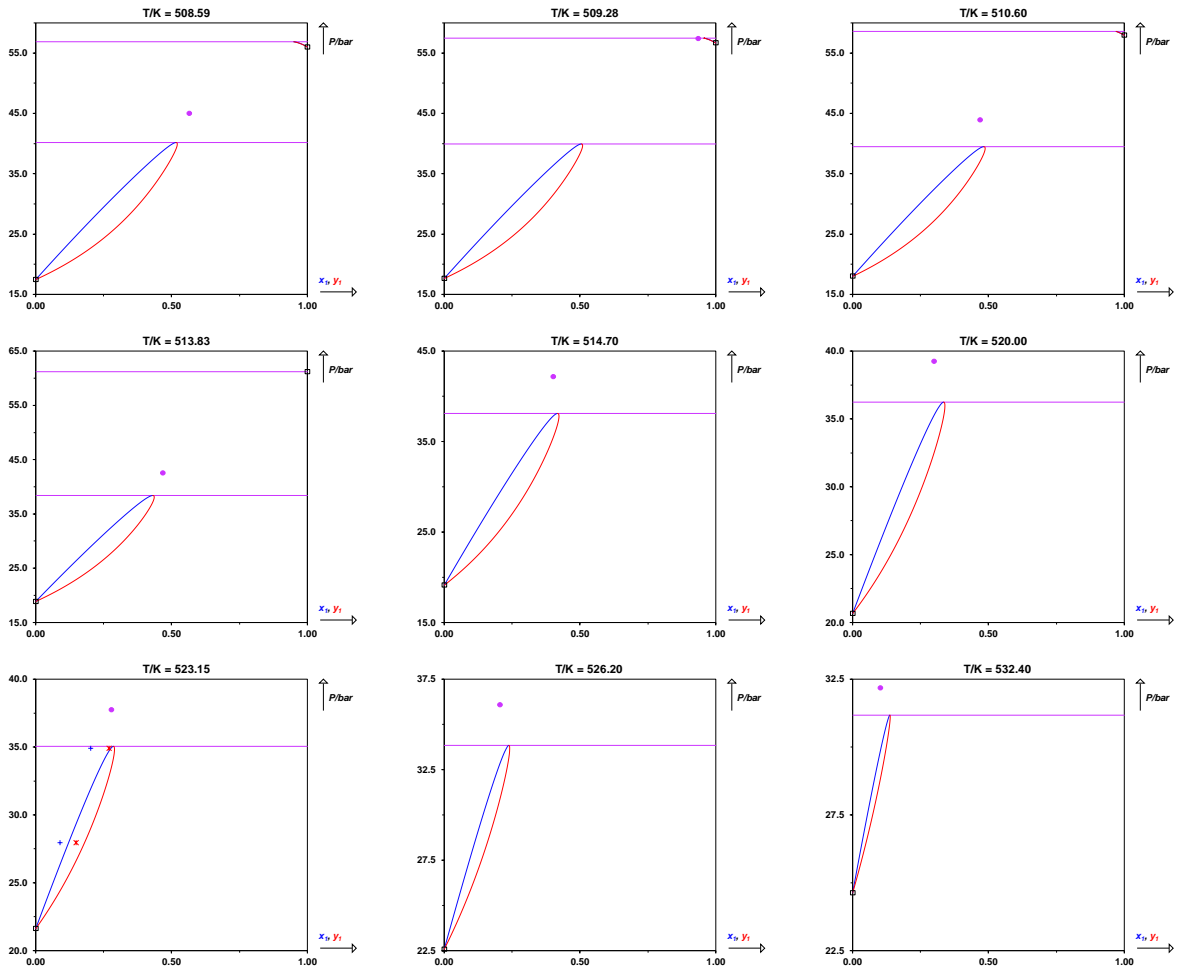
SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



ETHANE (1) + 1-PROPANOL (2)

CAS	74-84-0	71-23-8
InChiKey	OTMSDBZUPAUEDD-UHFFFAOYSA-N	BDERNNFJNOPAEC-UHFFFAOYSA-N
T_c / K	305.32	536.80
P_c / bar	48.72	51.69
ω	0.099	0.621

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 88.48$

$B/\text{MPa} = 80.53$

Deviations

MAPE on $x = 9.1\%$

MAPE on $y = 47\%$

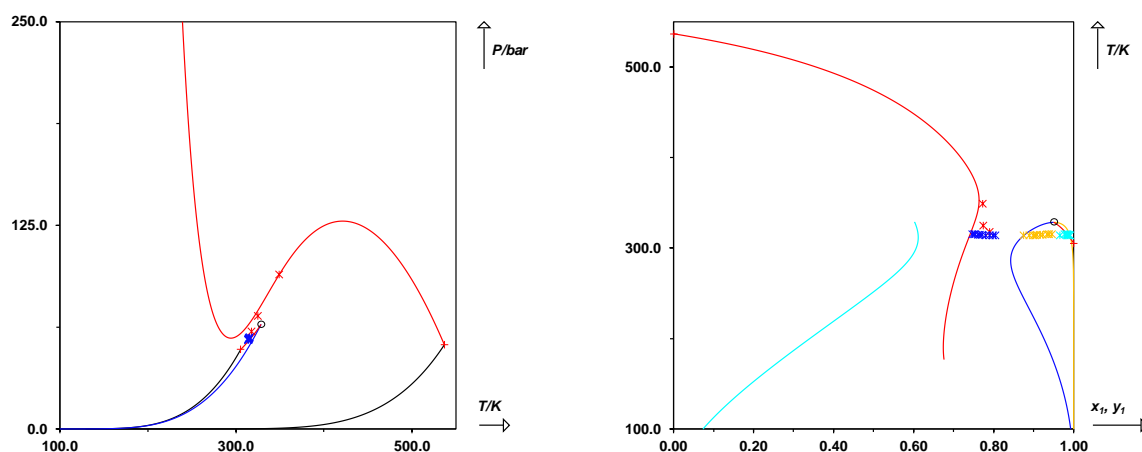
MAPE on $x_c = 2.5\%$

MAPE on $P_c = 0.52\%$

MAPE on $x_{LLV} = 31\%$

MAPE on $P_{LLV} = 9.0\%$

MAPE on $h^M = 44\%$



-----				13.56	0.0800	0.9840	
Isothermal phase equilibrium data				28.11	0.1740	0.9900	
-----				59.67	0.4210	0.9890	
Jiménez-Gallegos, Rodrigo - Galicia-Luna, Luis A. - Bouchot, Christian - Camacho-Camacho, Luis E. - Elizalde- Solis, Octavio, Experimental Determination and Correlation of Phase Equilibria for the Ethane + 1- Propanol and Propane + 1-Propanol Systems, Journal of Chemical & Engineering Data. 51 (2006) 1629-1633. doi:10.1021/je060112r				67.42	0.5030	0.9710	
T / K = 317.59				Jiménez-Gallegos, Rodrigo - Galicia-Luna, Luis A. - Bouchot, Christian - Camacho-Camacho, Luis E. - Elizalde- Solis, Octavio, Experimental Determination and Correlation of Phase Equilibria for the Ethane + 1- Propanol and Propane + 1-Propanol Systems, Journal of Chemical & Engineering Data. 51 (2006) 1629-1633. doi:10.1021/je060112r			
P / bar	x ₁	y ₁		T / K = 348.68			
28.17	0.2210	0.9930		P / bar	x ₁	y ₁	
48.36	0.4350	0.9930		8.410	0.0410	0.9460	
53.36	0.5250	0.9920		18.17	0.0920	0.9680	
55.95	0.5870	0.9770		28.09	0.1420	0.9770	
57.27	0.6500	0.9680		36.03	0.1880	0.9790	
57.73	0.6570	0.9600		43.44	0.2290	0.9800	
58.68	0.6880	0.9230		50.57	0.2680	0.9790	
59.57	0.7080	0.8720		57.11	0.3070	0.9780	
59.78	0.7890	0.7890	CRIT	63.24	0.3450	0.9760	
Jiménez-Gallegos, Rodrigo - Galicia-Luna, Luis A. - Bouchot, Christian - Camacho-Camacho, Luis E. - Elizalde- Solis, Octavio, Experimental Determination and Correlation of Phase Equilibria for the Ethane + 1- Propanol and Propane + 1-Propanol Systems, Journal of Chemical & Engineering Data. 51 (2006) 1629-1633. doi:10.1021/je060112r				70.76	0.3970	0.9710	
T / K = 324.51				76.82	0.4550	0.9650	
P / bar	x ₁	y ₁		85.29	0.5480	0.9480	
32.43	0.2320	0.9910		89.29	0.6000	0.9190	
52.41	0.4200	0.9910		91.70	0.6570	0.8870	
58.80	0.5070	0.9880		93.96	0.7060	0.8660	
61.11	0.5510	0.9850		94.88	0.7720	0.7720	CRIT
63.62	0.5900	0.9650		-----			
65.46	0.6440	0.9440		Enthalpy of mixing			
66.76	0.6750	0.9250		-----			
67.82	0.7040	0.8800		McFall, T.A. - Post, M.E. - Christensen, J.J. - Izatt, R.M., The excess enthalpies of eight (ethane + alcohol) mixtures at 298.15 K, The Journal of Chemical Thermodynamics. 13 (1981) 441-446. doi:10.1016/0021-9614(81)90051-3			
68.24	0.7340	0.8450		T / K = 298.15			
69.32	0.7740	0.7740	CRIT	P / bar = 69.00			
Suzuki, Kazuhiko - Sue, Haruhusa - Itou, Masahiro - Smith, Richard L. - Inomata, Hiroshi - Arai, Kunio - Saito, Shozaburo, Isothermal vapor-liquid equilibrium data for binary systems at high pressures: carbon dioxide- methanol, carbon dioxide-ethanol, carbon dioxide-1- propanol, methane-ethanol, methane-1-propanol, ethane-ethanol, and ethane-1-propanol systems, Journal of Chemical & Engineering Data. 35 (1990) 63-66. doi:10.1021/je00059a020				h ^M / J.mol ⁻¹			
T / K = 333.40				z ₁			
P / bar	x ₁	y ₁		-15.39	0.0182		
				-57.04	0.0730		
				-96.91	0.1285		
				-137.32	0.1846		
				-171.08	0.2414		
				-204.25	0.2989		
				-228.87	0.3570		
				-240.33	0.4158		
				-249.67	0.4753		
				-246.26	0.5053		
				-248.97	0.5355		

SA-NA systems (BAC = 5)

-241.51	0.5659	119.60	0.8834
-235.20	0.5964	130.10	0.9334
-224.27	0.6272	127.80	0.9667
-212.87	0.6581		
-194.66	0.6892		
-175.50	0.7205		
-152.57	0.7520		
-132.93	0.7837		
-100.67	0.8156		
-74.47	0.8477		
-37.36	0.8799		
-3.940	0.9124		
28.13	0.9342		
43.98	0.9451		
58.48	0.9560		
73.39	0.9670		
84.97	0.9780		
86.11	0.9890		
Ott, J.B. - Lemon, L.R. - Sipowska, J.T. - Brown, P.R., Excess enthalpies and excess volumes for (ethane + propan-1-ol) at the temperatures (298.15, 323.15, and 348.15) K and at the pressures (5, 10, 12.5, and 15) MPa, The Journal of Chemical Thermodynamics. 27 (1995) 1033-1045. doi:10.1006/jcht.1995.0108			
T / K = 298.15		T / K = 323.15	
P / bar = 125.00		P / bar = 50.00	
$h^M / J.mol^{-1}$ z_1		$h^M / J.mol^{-1}$ z_1	
-12.00	0.0167	-170.37	0.0297
-18.60	0.0500	-340.01	0.0597
-32.30	0.0834	-519.93	0.0899
-44.60	0.1334	-772.10	0.1356
-56.90	0.1667	-960.54	0.1664
-62.40	0.2168	-1271.2	0.2130
-69.10	0.2501	-1432.7	0.2443
-72.40	0.2834	-1692.6	0.2918
-74.50	0.3334	-1956.2	0.3398
-76.20	0.3668	-2172.6	0.3721
-71.50	0.4168	-2211.4	0.4047
-67.10	0.4501	-2091.6	0.4541
-56.80	0.4835	-1908.0	0.4873
-45.00	0.5335	-1710.1	0.5376
-31.70	0.5668	-1583.2	0.5715
-11.60	0.6168	-1431.7	0.6056
5.200	0.6501	-1212.0	0.6574
22.40	0.6834	-1087.9	0.6922
49.90	0.7334	-935.85	0.7273
65.60	0.7668	-793.69	0.7627
92.60	0.8167	-565.67	0.8164
105.90	0.8501	-410.60	0.8525
		-261.31	0.8889
		-104.29	0.9256
		53.68	0.9627
		127.57	0.9819
		153.53	0.9863
		165.49	0.9890
Ott, J.B. - Lemon, L.R. - Sipowska, J.T. - Brown, P.R., Excess enthalpies and excess volumes for (ethane + propan-1-ol) at the temperatures (298.15, 323.15, and 348.15) K and at the pressures (5, 10, 12.5, and 15) MPa, The Journal of Chemical Thermodynamics. 27 (1995) 1033-1045. doi:10.1006/jcht.1995.0108			
T / K = 348.15		T / K = 348.15	
P / bar = 50.00		P / bar = 50.00	
$h^M / J.mol^{-1}$ z_1		$h^M / J.mol^{-1}$ z_1	

SA-NA systems (BAC = 5)

-161.98	0.0297	315.35	56.34	0.7467	0.9457	0.9762
-309.57	0.0597					
-453.42	0.0899					
-698.92	0.1356					
-885.53	0.1664					
-1092.6	0.2130					
-1226.3	0.2443					
-1390.5	0.2918					
-1371.8	0.2918					
-1270.1	0.3398					
-1167.9	0.3721					
-1022.8	0.4047					
-918.96	0.4541					
-831.57	0.4873					
-688.40	0.5376					
-599.92	0.5715					
-500.69	0.6056					
-353.27	0.6574					
-256.95	0.6922					
-151.07	0.7273					
-60.82	0.7627					
91.25	0.8164					
211.33	0.8525					
290.49	0.8889					
339.82	0.9072					
402.64	0.9256					
509.79	0.9627					
552.02	0.9813					
568.07	0.9860					
409.83	0.9888					
320.68	0.9906					
293.28	0.9920					

Kodama, Daisuke - Tanaka, Hiroyuki - Kato, Masahiro, High Pressure Phase Equilibrium for Ethane + 1-Propanol at 314.15 K, Journal of Chemical & Engineering Data. 46 (2001) 1280-1282. doi:10.1021/je010077i

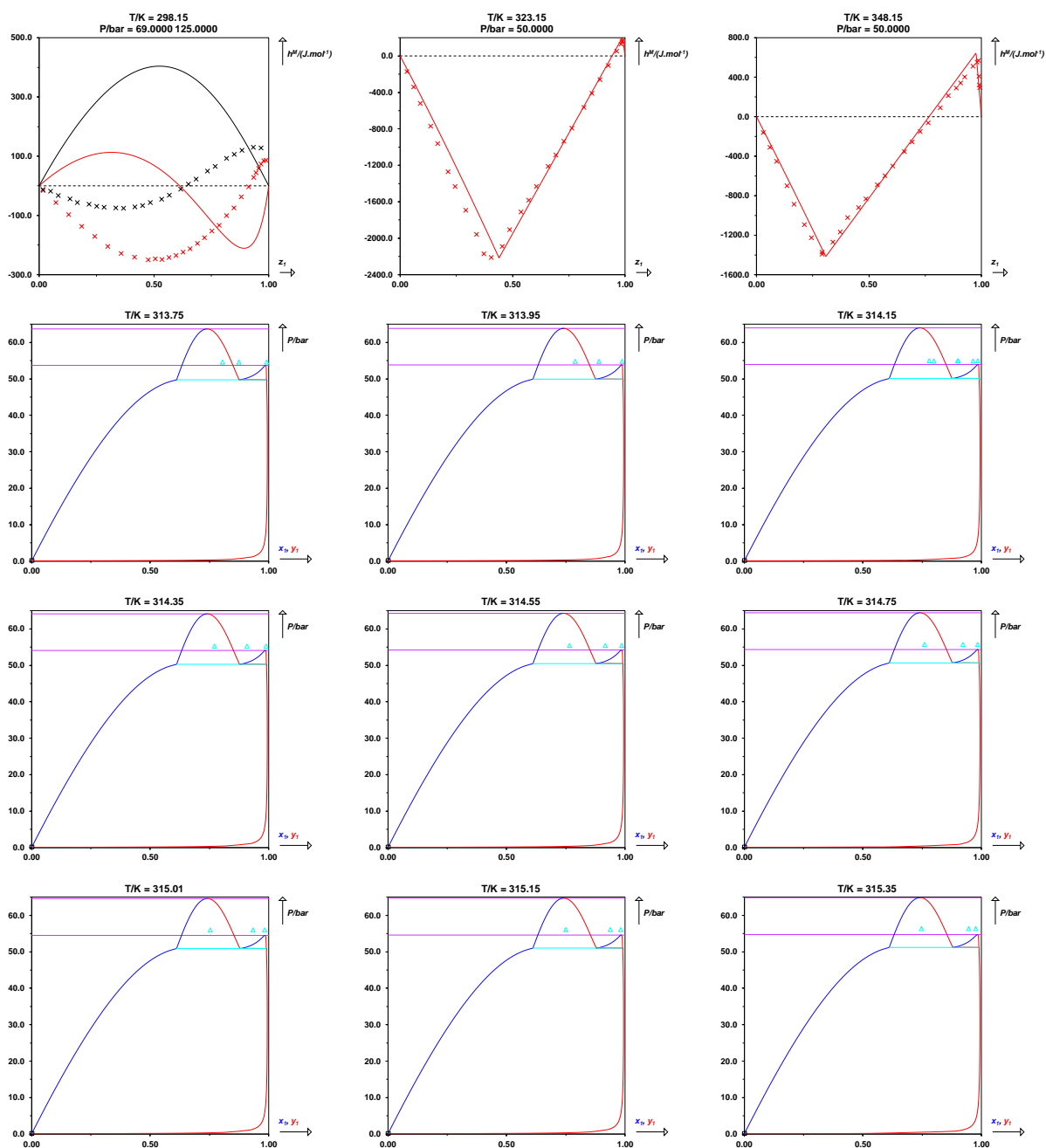
T / K	P / bar	x_1^a	x_1^b	y_1
314.15	54.89	0.7990	0.9030	0.9650

Three-phase line

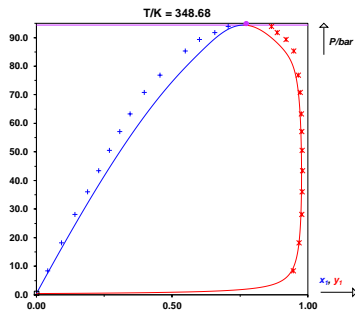
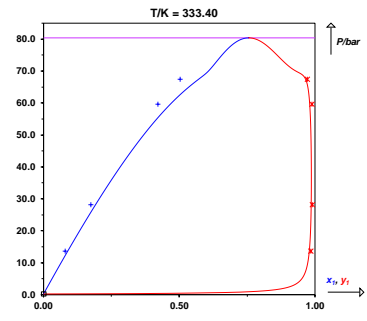
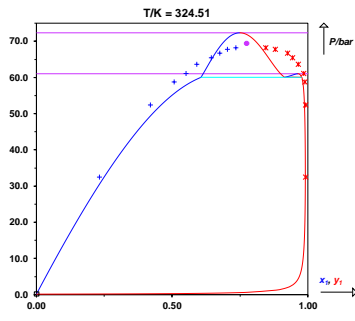
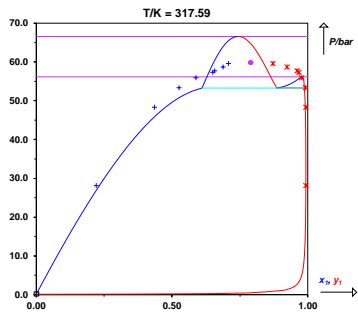
Lam, Daniel H. - Jangkamolkulchai, Adisak - Luks, Kraemer D., Liquid-liquid-vapor phase equilibrium behavior of certain binary ethane + n-alkanol mixtures, Fluid Phase Equilibria. 59 (1990) 263-277. doi:10.1016/0378-3812(90)80003-T

T / K	P / bar	x_1^a	x_1^b	y_1
313.75	54.57	0.8046	0.8741	0.9918
313.95	54.79	0.7893	0.8892	0.9877
314.15	55.01	0.7798	0.8996	0.9850
314.35	55.24	0.7716	0.9081	0.9889
314.55	55.46	0.7656	0.9161	0.9855
314.75	55.67	0.7605	0.9227	0.9841
315.01	55.97	0.7533	0.9331	0.9837
315.15	56.11	0.7505	0.9375	0.9812

SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



1-PROPANOL (1) + BENZENE (2)

CAS	71-23-8	71-43-2
InChiKey	BDERNNFJNOPAEC-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	536.80	562.05
P_c / bar	51.69	48.95
ω	0.621	0.210

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = 106.5$

$B/\text{MPa} = 69.72$

Deviations

MAPE on $x = 21\%$

MAPE on $y = 16\%$

MAPE on $x_c = 96\%$

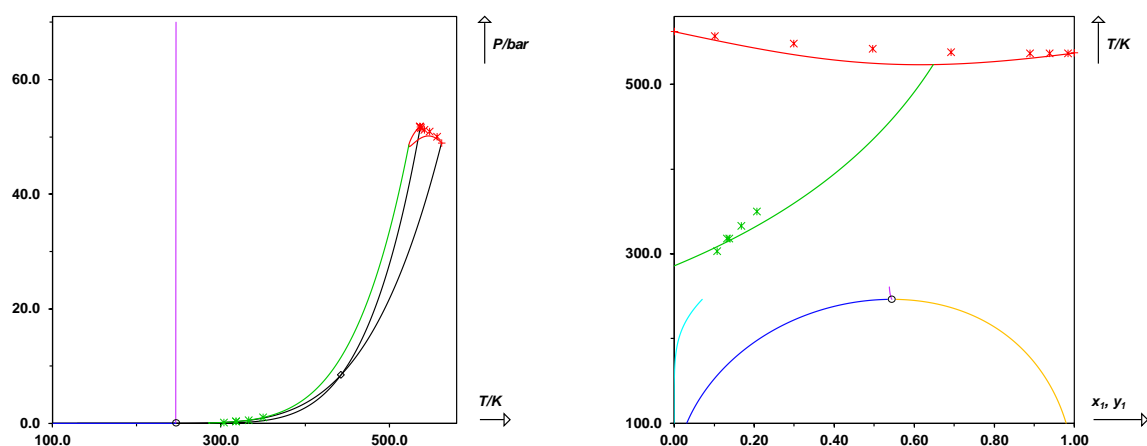
MAPE on $P_c = 2.0\%$

MAPE on $x_{az} = 12\%$

MAPE on $P_{az} = 0.45\%$

MAPE on $h^M = 33\%$

MAPE on $c_p^M = 200\%$



SA-NA systems (BAC = 5)

-----			0.3126	0.3555	0.1878
Isothermal phase equilibrium data			0.3160	0.2648	0.1746
-----			0.3184	0.1866	0.1518
Udovenko, V.V. - Mazanko, T.F., Liquid-vapor equilibrium in propyl alcohol-water and propyl alcohol-benzene systems, Izv. Vyssh. Uchebn. Zaved. Khim. Khim. Tekhnol. 15 (1972) 1654-1658.			0.3189	0.1457	0.1384
T / K = 303.15			0.3189	0.1370	0.1370 AZEO
P / bar	x_1	y_1	0.3184	0.1015	0.1213
0.1028	0.8664	0.3545	0.3133	0.0476	0.0841
0.1143	0.8088	0.2910	0.3077	0.0258	0.0488
0.1327	0.7161	0.2336	Strubl, K. - Svoboda, V. - Holub, R. - Pick, J., Liquid-vapour equilibrium in the benzene-n-propanol system, Collection of Czechoslovak Chemical Communications. 40 (1975) 1647-1656. doi:10.1135/ccccc19751647		
0.1459	0.6232	0.1984	T / K = 328.15		
0.1597	0.4538	0.1734	P / bar	x_1	y_1
0.1652	0.3246	0.1481	0.1712	0.9895	0.9120
0.1680	0.1866	0.1201	0.1956	0.9694	0.7831
0.1685	0.1070	0.1070 AZEO	0.2023	0.9635	0.7525
0.1683	0.0804	0.0991	0.2185	0.9486	0.6866
0.1667	0.0425	0.0703	0.2321	0.9352	0.6372
0.1651	0.0194	0.0476	0.2560	0.9109	0.5652
Brown, I - Smith, F, Liquid-Vapour Equilibria. IX. The Systems n-Propanol + Benzene and n-Butanol + Benzene at 45°C, Australian Journal of Chemistry. 12 (1959) doi:10.1071/CH9590407			0.2720	0.8929	0.5240
T / K = 318.15			0.2885	0.8676	0.4796
P / bar	x_1	y_1	0.3293	0.8140	0.4024
0.1628	0.9140	0.5252	0.3369	0.8050	0.3873
0.2267	0.7982	0.3437	0.3576	0.7665	0.3587
0.2595	0.7033	0.2790	0.3973	0.6659	0.2952
0.2814	0.6053	0.2402	0.4242	0.5620	0.2596
0.2939	0.5252	0.2185	0.4456	0.4499	0.2260
0.2988	0.4807	0.2080	0.4633	0.3465	0.1990
0.3060	0.4061	0.1935	0.4641	0.2557	0.1850
0.3132	0.2973	0.1728	0.4697	0.1747	0.1690
0.3167	0.2144	0.1560	0.4672	0.0896	0.1272
0.3186	0.1320	0.1320 AZEO	0.4636	0.0320	0.0710
0.3178	0.0977	0.1194	0.4561	0.0079	0.0240
0.3137	0.0470	0.0843	Kurihara, Kiyofumi - Uchiyama, Masanori - Kojima, Kazuo, Isothermal Vapor-Liquid Equilibria for Benzene + Cyclohexane + 1-Propanol and for Three Constituent Binary Systems, Journal of Chemical & Engineering Data. 42 (1997) 149-154. doi:10.1021/je9602475		
Udovenko, V.V. - Mazanko, T.F., Liquid-vapor equilibrium in propyl alcohol-water and propyl alcohol-benzene systems, Izv. Vyssh. Uchebn. Zaved. Khim. Khim. Tekhnol. 15 (1972) 1654-1658.			T / K = 333.15		
T / K = 318.15			P / bar	x_1	y_1
P / bar	x_1	y_1	0.2861	0.9430	0.6790
0.1193	0.9752	0.7976	0.3616	0.8690	0.5070
0.1545	0.9293	0.5769	0.3759	0.8560	0.4770
0.2055	0.8429	0.3881	0.4303	0.7810	0.3910
0.2447	0.7520	0.2910	0.4443	0.7580	0.3730
0.2808	0.6137	0.2336	0.4592	0.7300	0.3520
0.3024	0.4642	0.2114	0.4723	0.6940	0.3340
			0.5056	0.6180	0.2940

SA-NA systems (BAC = 5)

0.5091	0.6080	0.2870		327.44	0.0513	0.0984
0.5241	0.5520	0.2700		328.05	0.0210	0.0542
0.5275	0.5430	0.2660		328.65	0.0039	0.0160
0.5353	0.4900	0.2540				
0.5471	0.4330	0.2390		Strubl, K. - Svoboda, V. - Holub, R. - Pick, J., Liquid-vapour		
0.5496	0.4160	0.2340		equilibrium in the benzene-n-propanol system, Collection of		
0.5519	0.3970	0.2300		Czechoslovak Chemical Communications. 40 (1975) 1647-1656.		
0.5546	0.3770	0.2250		doi:10.1135/cccc19751647		
0.5583	0.3440	0.2180		P / bar = 0.6949		
0.5622	0.3030	0.2070		T / K	x ₁	y ₁
0.5655	0.2350	0.1910		358.33	0.9799	0.9000
0.5661	0.2170	0.1860		355.48	0.9474	0.7777
0.5668	0.1970	0.1800		353.56	0.9261	0.7068
0.5670	0.1680	0.1680	AZEO	352.03	0.9000	0.6463
0.5667	0.1420	0.1570		348.91	0.8474	0.5353
0.5662	0.1260	0.1510		345.66	0.7826	0.4367
0.5652	0.1110	0.1430		343.67	0.7134	0.3790
0.5637	0.0960	0.1340		342.38	0.6633	0.3477
0.5628	0.0910	0.1300		340.95	0.5724	0.2992
0.5624	0.0870	0.1270		340.14	0.4943	0.2726
0.5613	0.0810	0.1220		339.83	0.4522	0.2595
0.5596	0.0720	0.1150		339.38	0.3918	0.2416
0.5591	0.0680	0.1110		338.95	0.3110	0.2207
0.5584	0.0660	0.1100		338.80	0.2401	0.1990
0.5543	0.0500	0.0940		338.73	0.1707	0.1739
				338.75	0.1410	0.1568
				338.97	0.0807	0.1289
				339.53	0.0522	0.0930
				340.18	0.0200	0.0524
				340.93	0.0058	0.0160
Isobaric phase equilibrium data						
Strubl, K. - Svoboda, V. - Holub, R. - Pick, J., Liquid-vapour						
equilibrium in the benzene-n-propanol system, Collection of						
Czechoslovak Chemical Communications. 40 (1975) 1647-1656.						
doi:10.1135/cccc19751647						
P / bar = 0.4533						
T / K	x ₁	y ₁				
348.06	0.9807	0.8908				
345.20	0.9529	0.7683				
343.34	0.9330	0.6951				
341.45	0.9077	0.6194				
338.08	0.8569	0.5036				
334.55	0.7908	0.4024				
332.28	0.7258	0.3363				
331.07	0.6659	0.3054				
329.86	0.5817	0.2607				
328.69	0.4988	0.2305				
328.37	0.4614	0.2192				
327.82	0.3928	0.2014				
327.36	0.3163	0.1906				
327.16	0.2646	0.1703				
327.12	0.0880	0.1229				
				Hiaki, Toshihiko - Tochigi, Katsumi - Kojima, Kazuo, Measurement		
				of vapor-liquid equilibria and determination of azeotropic point,		
				Fluid Phase Equilibria. 26 (1986) 83-102. doi:10.1016/0378-		
				3812(86)85006-3		
				P / bar = 1.013		
				T / K	x ₁	y ₁
				361.87	0.8960	0.6600
				357.02	0.7840	0.4860
				355.46	0.7330	0.4370
				353.00	0.6300	0.3680
				351.69	0.5210	0.3110
				350.78	0.4330	0.2750
				350.76	0.4190	0.2690
				350.66	0.3960	0.2650
				350.47	0.3580	0.2520
				350.36	0.3370	0.2440
				350.30	0.3170	0.2360
				350.20	0.2960	0.2300
				350.11	0.2470	0.2170
				350.07	0.2320	0.2140

SA-NA systems (BAC = 5)

350.07	0.2130	0.2090		331.90	0.0344
350.05	0.2060	0.2060	AZEO		
350.06	0.2030	0.2050		Chao, J.P. - Dai, M., Studies on thermodynamic properties of binary systems containing alcohols. VII. Temperature dependence of excess enthalpies for n-propanol + benzene an, Thermochemica Acta. 123 (1988) 285-291. doi:10.1016/0040-6031(88)80032-7	
350.07	0.2000	0.2040			
350.09	0.1940	0.2020			
350.14	0.1350	0.1800			
350.47	0.1010	0.1570		T / K =	293.15
351.74	0.0310	0.0700		P / bar =	UNKNOWN (1.0132)
Shouyu Wang - Chenpu Zao, VLE data for benzene-n-propanol-lithium chloride system, Huaxue Gongcheng. 19 (1991) 72-76.				$h^M / J.mol^{-1}$	x_1
P / bar =	1.013			145.10	0.9312
T / K	x_1	y_1		241.60	0.8891
366.15	0.9580	0.8140		332.50	0.8463
362.05	0.9030	0.6770		417.20	0.8028
358.95	0.8500	0.5610		502.50	0.7587
357.05	0.8020	0.4940		589.90	0.7138
353.95	0.7020	0.3940		669.40	0.6682
352.35	0.5840	0.3300		743.60	0.6218
351.15	0.4820	0.2930		808.90	0.5747
350.45	0.3620	0.2590		869.90	0.5268
350.25	0.2830	0.2340		906.80	0.4945
350.05	0.1900	0.2000		934.50	0.4617
350.25	0.1400	0.1740		958.40	0.4286
350.45	0.0830	0.1300		971.50	0.3951
351.35	0.0500	0.0990		977.70	0.3612
				976.30	0.3270
				966.40	0.2923
				947.20	0.2573
				914.90	0.2218
				868.60	0.1859
				808.80	0.1496
				722.80	0.1129
				602.50	0.0757
Enthalpy of mixing					
Cen, P. - Zhu, Z., The Measurement of Mixing Heat and the Prediction of Vapor-Liquid Equilibrium Data for Hydrocarbon - Alcohol Systems, Huagong Xuebao. 35 (1984) 51-65.					
T / K =	288.15			Chao, J.P. - Dai, M., Studies on thermodynamic properties of binary systems containing alcohols. VII. Temperature dependence of excess enthalpies for n-propanol + benzene an, Thermochemica Acta. 123 (1988) 285-291. doi:10.1016/0040-6031(88)80032-7	
P / bar =	UNKNOWN (1.0132)			T / K =	303.15
$h^M / J.mol^{-1}$	x_1			P / bar =	UNKNOWN (1.0132)
72.50	0.9639			$h^M / J.mol^{-1}$	x_1
152.00	0.9217			178.20	0.9312
254.00	0.8643			294.00	0.8891
370.00	0.8059			397.50	0.8463
488.40	0.7464			494.00	0.8028
585.00	0.6851			597.70	0.7587
683.60	0.6229			691.20	0.7138
756.40	0.5592			793.70	0.6682
802.80	0.4669			873.20	0.6218
833.50	0.4277			953.20	0.5747
858.80	0.3599				
839.30	0.2903				
799.60	0.2194				
584.10	0.0910				

1015.2	0.5268	Thermochimica Acta. 123 (1988) 285-291. doi:10.1016/0040-6031(88)80032-7
1045.1	0.4945	T / K = 323.15
1075.7	0.4617	P / bar = UNKNOWN (1.0132)
1100.1	0.4286	$h^M / \text{J.mol}^{-1}$ x_1
1115.2	0.3951	263.10 0.9312
1126.6	0.3612	422.60 0.8891
1124.1	0.3270	571.00 0.8463
1111.1	0.2923	721.70 0.8028
1084.0	0.2573	859.20 0.7587
1047.5	0.2218	983.10 0.7138
992.90	0.1859	1093.0 0.6682
917.00	0.1496	1195.1 0.6218
818.50	0.1129	1282.7 0.5747
676.20	0.0757	1352.2 0.5268
Chao, J.P. - Dai, M., Studies on thermodynamic properties of binary systems containing alcohols. VII. Temperature dependence of excess enthalpies for n-propanol + benzene an, Thermochimica Acta. 123 (1988) 285-291. doi:10.1016/0040-6031(88)80032-7		1386.0 0.4945
T / K = 313.15		1410.3 0.4617
P / bar = UNKNOWN (1.0132)		1427.6 0.4286
$h^M / \text{J.mol}^{-1}$ x_1		1433.0 0.3951
215.30 0.9312		1426.4 0.3612
344.80 0.8891		1410.3 0.3270
473.80 0.8463		1381.0 0.2923
600.10 0.8028		1336.4 0.2573
721.50 0.7587		1273.4 0.2218
833.70 0.7138		1193.7 0.1859
937.70 0.6682		1087.4 0.1496
1030.4 0.6218		951.10 0.1129
1115.9 0.5747		776.50 0.0757
1187.3 0.5268		
1219.3 0.4945		Heat capacity of mixing
1255.7 0.4617		Recko, W.M., Excess heat capacity of the binary systems formed by n-propyl alcohol with benzene, mesitylene, and cyclohexane, Bull. Acad. Pol. Sci. Ser. Sci. Chim. 16 (1968) 549-552.
1265.9 0.4286		T / K = 298.15
1276.1 0.3951		P / bar = UNKNOWN (1.0132)
1276.8 0.3612		$c_P^M / \text{J.mol}^{-1} \cdot \text{K}^{-1}$ x_1
1263.6 0.3270		9.800 0.8123
1238.7 0.2923		11.00 0.6602
1204.2 0.2573		14.20 0.5012
1147.7 0.2218		14.80 0.3570
1082.2 0.1859		13.10 0.2100
986.60 0.1496		
880.30 0.1129		Recko, W.M., Excess heat capacity of the binary systems formed by n-propyl alcohol with benzene, mesitylene, and cyclohexane, Bull. Acad. Pol. Sci. Ser. Sci. Chim. 16 (1968) 549-552.
710.20 0.0757		T / K = 303.15
Chao, J.P. - Dai, M., Studies on thermodynamic properties of binary systems containing alcohols. VII. Temperature dependence of excess enthalpies for n-propanol + benzene an,		P / bar = UNKNOWN (1.0132)
		$c_P^M / \text{J.mol}^{-1} \cdot \text{K}^{-1}$ x_1
		10.30 0.8123

12.20	0.6602
15.20	0.5012
15.80	0.3570
13.60	0.2100

Recko, W.M., Excess heat capacity of the binary systems formed by n-propyl alcohol with benzene, mesitylene, and cyclohexane, Bull. Acad. Pol. Sci. Ser. Sci. Chim. 16 (1968) 549-552.

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
11.00	0.8123
12.60	0.6602
15.50	0.5012
16.00	0.3570
13.60	0.2100

Recko, W.M., Excess heat capacity of the binary systems formed by n-propyl alcohol with benzene, mesitylene, and cyclohexane, Bull. Acad. Pol. Sci. Ser. Sci. Chim. 16 (1968) 549-552.

T / K = 313.15

P / bar = UNKNOWN (1.0132)

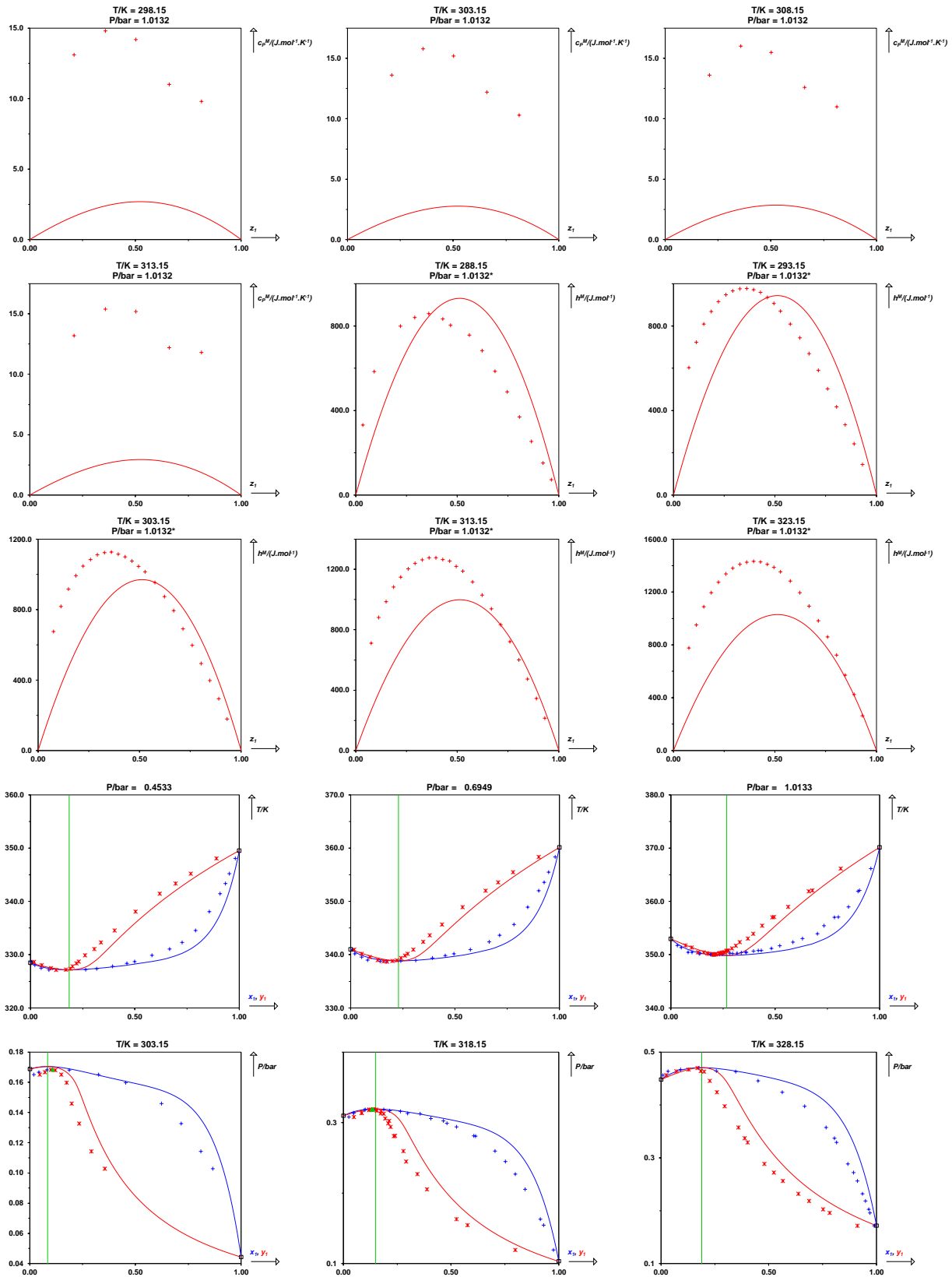
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
11.80	0.8123
12.20	0.6602
15.20	0.5012
15.40	0.3570
13.20	0.2100

Critical point

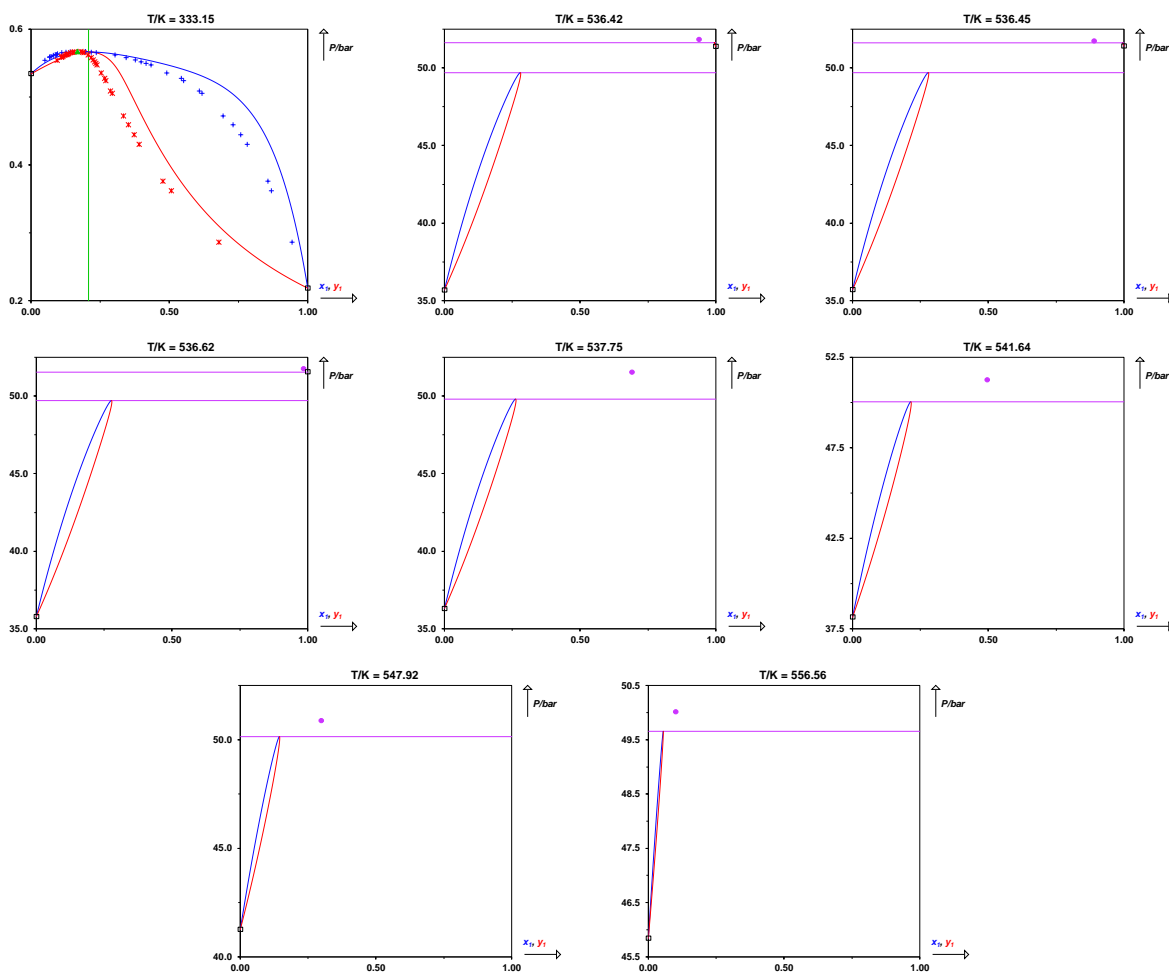
Skaates, J.M. - Kay, W.B., The phase relations of binary systems that form azeotropes, Chemical Engineering Science. 19 (1964) 431-444. doi:10.1016/0009-2509(64)85070-3

T / K	P / bar	x_1
536.42	51.84	0.9381
536.45	51.72	0.8894
536.62	51.75	0.9848
537.75	51.54	0.6912
541.64	51.25	0.4963
547.92	50.86	0.2984
556.56	50.01	0.1010

SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



n-HEXANE (1) + 1-PROPANOL (2)

CAS	110-54-3	71-23-8
InChiKey	VLKZOEYAKHREP-UHFFFAOYSA-N	BDERNNFJNOPAEC-UHFFFAOYSA-N
T_c / K	507.60	536.80
P_c / bar	30.25	51.69
ω	0.301	0.621

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = 257.4$

$B/\text{MPa} = 680.4$

Deviations

MAPE on $x = 62\%$

MAPE on $y = 15\%$

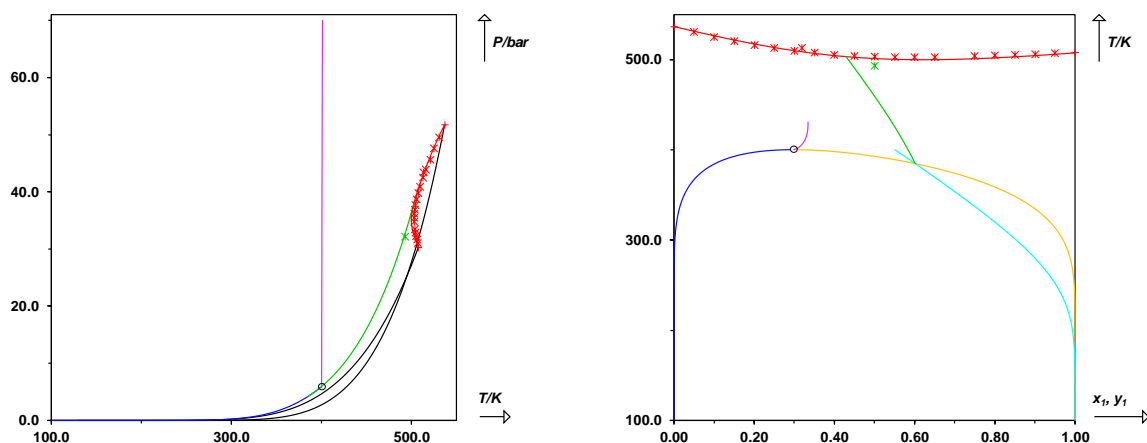
MAPE on $x_c = 17\%$

MAPE on $P_c = 2.7\%$

MAPE on $x_{az} = 11\%$

MAPE on $P_{az} = 2.0\%$

MAPE on $h^M = 41\%$



Isothermal phase equilibrium data			0.9846	0.6120	0.7880
-----			0.9928	0.6590	0.8040
-----			0.9964	0.7050	0.8100
Diaz Pena, M. - Rodriguez Cheda, D.R., Liquid-vapor equilibrium. III. Systems of n-propanol-n-hexane at 50. deg. and n-propanol-n-heptane at 60. deg, An. Quim. 66 (1970) 747-755.			1.001	0.7760	0.8180
T / K =	323.15		0.9971	0.8820	0.8400
P / bar	x ₁	y ₁	0.9981	0.9080	0.8550
0.2375	0.0426	0.5019	0.9948	0.9240	0.8600
0.2591	0.0528	0.5482	0.9838	0.9430	0.8810
0.2753	0.0606	0.5764	0.9813	0.9530	0.8890
0.3210	0.0848	0.6423	0.9797	0.9590	0.8970
0.3407	0.0976	0.6649	0.9682	0.9680	0.9050
0.3696	0.1175	0.6960	Maciel, Maria Regina W - Francesconi, A.Z, Excess Gibbs free energies of (n-hexane + propan-1-ol) at 338.15 and 348.15 K and of (n-hexane + propan-2-ol) at 323.15, 338.15, and 348.15 K, The Journal of Chemical Thermodynamics. 20 (1988) 539-544. doi:10.1016/0021-9614(88)90081-X		
0.4374	0.1802	0.7513	T / K =	348.15	
0.4463	0.1898	0.7576	P / bar	x ₁	y ₁
0.4774	0.2327	0.7787	0.4669	0.0070	0.1110
0.5043	0.2795	0.7940	0.5805	0.0250	0.2970
0.5100	0.2924	0.7988	0.6397	0.0340	0.3610
0.5375	0.3698	0.8140	0.7456	0.0590	0.4630
0.5482	0.4125	0.8220	0.8403	0.0800	0.5280
0.5494	0.4178	0.8218	0.9444	0.1110	0.5910
0.5581	0.4613	0.8265	1.079	0.1780	0.6590
0.5692	0.5787	0.8361	1.202	0.2640	0.7170
0.5702	0.6003	0.8375	1.254	0.3320	0.7290
0.5760	0.8497	0.8536	1.305	0.4280	0.7500
0.5706	0.9325	0.8951	1.348	0.5600	0.7650
0.5508	0.9825	0.9630	1.353	0.6030	0.7720
Maciel, Maria Regina W - Francesconi, A.Z, Excess Gibbs free energies of (n-hexane + propan-1-ol) at 338.15 and 348.15 K and of (n-hexane + propan-2-ol) at 323.15, 338.15, and 348.15 K, The Journal of Chemical Thermodynamics. 20 (1988) 539-544. doi:10.1016/0021-9614(88)90081-X			1.363	0.6490	0.7750
T / K =	338.15		1.375	0.7920	0.7980
P / bar	x ₁	y ₁	1.379	0.8150	0.8030
0.2773	0.0010	0.0500	1.356	0.9330	0.8550
0.2978	0.0040	0.1140	1.254	0.9910	0.9760
0.3588	0.0160	0.2490	Oh, Byung Chul - Kim, Youngdae - Shin, Hun Yong - Kim, Hwayong, Vapor-liquid equilibria for the system 1-propanol+n-hexane near the critical region, Fluid Phase Equilibria. 220 (2004) 41-46. doi:10.1016/j.fluid.2003.12.004		
0.4442	0.0250	0.4140	T / K =	493.15	
0.5826	0.0730	0.5740	P / bar	x ₁	y ₁
0.7349	0.1430	0.6790	26.00	0.0290	0.0540
0.7892	0.1680	0.6950	28.00	0.0960	0.1550
0.8349	0.2200	0.7210	30.82	0.2470	0.3190
0.8717	0.2660	0.7370	31.81	0.3540	0.4060
0.9297	0.3710	0.7670	32.12	0.4210	0.4410
0.9666	0.4860	0.7820	32.15	0.4730	0.4940
0.9726	0.5330	0.7900			
0.9753	0.5850	0.7950			

SA-NA systems (BAC = 5)

32.15	0.5000	0.5000	AZEO	different group contribution models and empirical methods, Journal of Thermal Analysis and Calorimetry. 80 (2005) 303-309. doi:10.1007/s10973-005-0651-4
31.60	0.6190	0.5920		
31.06	0.6840	0.6470		
29.87	0.7590	0.7270		T / K = 298.15
29.25	0.8070	0.7560		P / bar = 1.013
28.22	0.8520	0.8080		$h^M / J.mol^{-1}$ z_1
26.20	0.9420	0.9130		461.60 0.9013
				579.30 0.8016
				598.50 0.7316
				594.30 0.6365
				573.20 0.5658
				542.30 0.4966
				504.90 0.4298
				462.20 0.3573
				425.30 0.3165
				351.00 0.2490
				299.50 0.2033
				236.70 0.1582
				181.50 0.1159
				173.20 0.1087
				114.20 0.0674
				59.90 0.0341
Oh, Byung Chul - Kim, Youngdae - Shin, Hun Yong - Kim, Hwayong, Vapor-liquid equilibria for the system 1-propanol+n-hexane near the critical region, Fluid Phase Equilibria. 220 (2004) 41-46. doi:10.1016/j.fluid.2003.12.004				
T / K = 513.15				
P / bar	x_1	y_1		
37.14	0.0340	0.0640		
40.40	0.1340	0.1810		
42.12	0.2380	0.2650		
43.13	0.3000	0.3070		
43.32	0.3120	0.3190		
43.40	0.3190	0.3190	CRIT	

Enthalpy of mixing

Gmehling, J. - Meents, B., Excess enthalpy. 1-Propanol - hexane system, Int. Data Ser. Sel. Data Mixtures Ser. A. (1992)

T / K = 273.15

P / bar = 6.000

$h^M / J.mol^{-1}$ z_1

63.01	0.0600
63.10	0.0600
92.34	0.0920
120.13	0.1256
173.20	0.1976
224.62	0.2769
270.39	0.3648
311.56	0.4628
342.77	0.5727
351.68	0.6328
349.88	0.6968
336.74	0.7650
299.01	0.8379
272.92	0.8763
232.38	0.9161
177.66	0.9573

Mato, M. M. - Cebreiro, S. M. - Verdes, P. V. - Legido, J. L. - Paz Andrade, M. I., Thermodynamic properties of the ternary system MTBE+1-propanol+hexane: Application of

Brown, I - Fock, W - Smith, F, Heats of mixing. V. Systems of n-alcohols with n-hexane, Australian Journal of Chemistry. 17 (1964) doi:10.1071/CH9641106

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

561.00	0.3537
565.00	0.3562
567.00	0.3590
743.00	0.6190
746.00	0.6429
700.00	0.7889
680.00	0.8102
582.00	0.8874

Brown, I - Fock, W - Smith, F, Heats of mixing. V. Systems of n-alcohols with n-hexane, Australian Journal of Chemistry. 17 (1964) doi:10.1071/CH9641106

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

340.00	0.1523
680.00	0.3528
683.00	0.3533
703.00	0.3720
906.00	0.6185
905.00	0.6433
858.00	0.7885

SA-NA systems (BAC = 5)

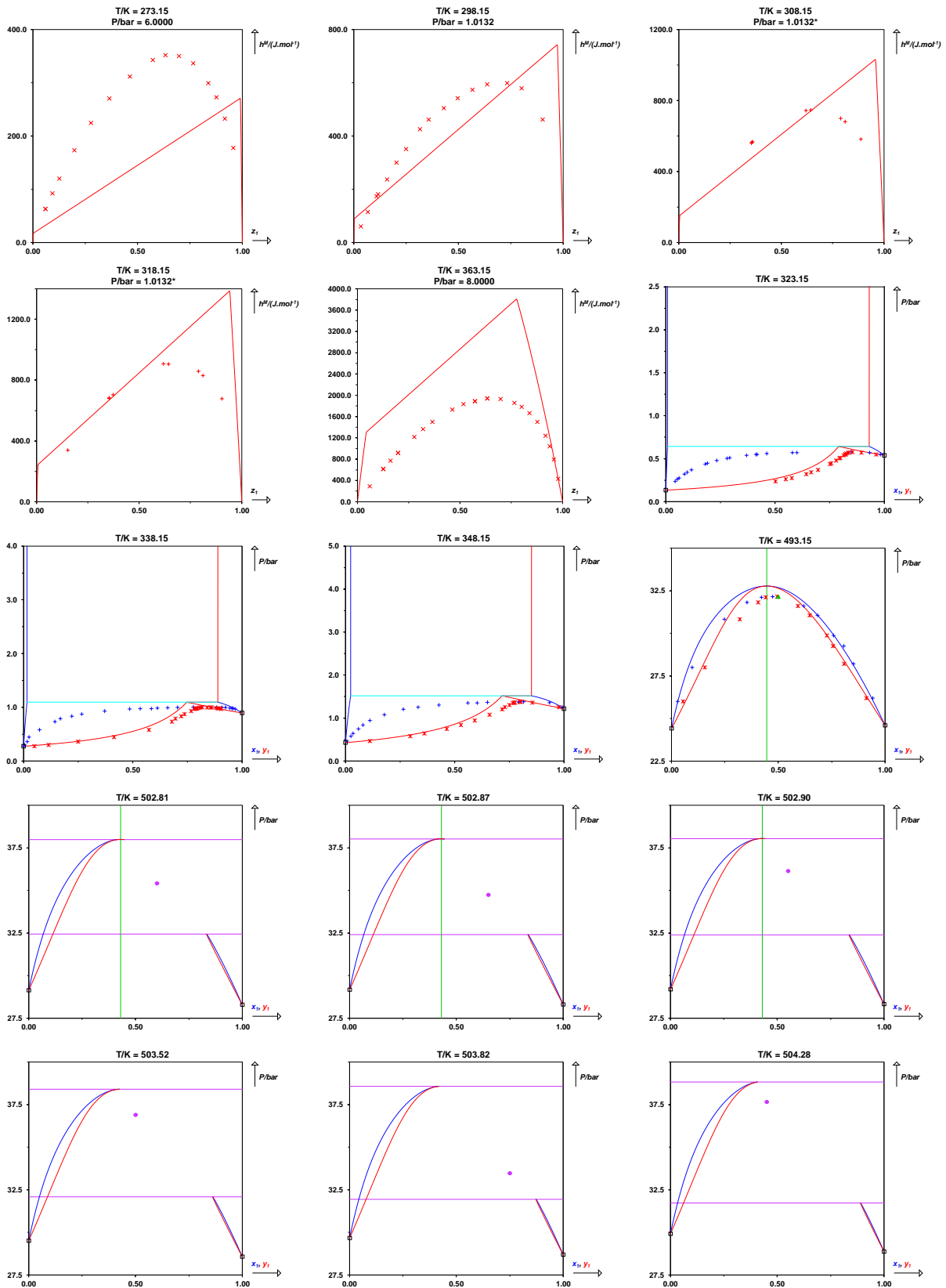
830.00	0.8106	504.58	32.87	0.7998
678.00	0.9034	505.24	32.26	0.8501
		505.50	38.67	0.4000
Gmehling, J. - Meents, B., Excess enthalpy. 1-Propanol - hexane system, Int. Data Ser. Sel. Data Mixtures Ser. A. (1992)		506.11	31.63	0.9002
		507.02	31.05	0.9498
		507.59	39.75	0.3498
T / K =	363.15	509.56	40.92	0.3001
P / bar =	8.000	512.88	42.45	0.2500
$h^M / \text{J.mol}^{-1}$	z_1	516.21	43.84	0.2000
292.84	0.0600	520.83	45.62	0.1501
614.18	0.1256	525.23	47.56	0.0999
615.36	0.1256	530.79	49.55	0.0500
772.89	0.1607			
917.57	0.1976			
917.15	0.1976			
1220.0	0.2769			
1364.7	0.3197			
1500.0	0.3648			
1731.2	0.4628			
1832.2	0.5162			
1884.6	0.5727			
1890.5	0.5727			
1943.3	0.6328			
1939.8	0.6328			
1932.4	0.6968			
1855.7	0.7650			
1783.6	0.8008			
1666.3	0.8379			
1501.5	0.8763			
1241.4	0.9161			
1043.3	0.9365			
794.04	0.9573			
431.35	0.9784			

Critical point

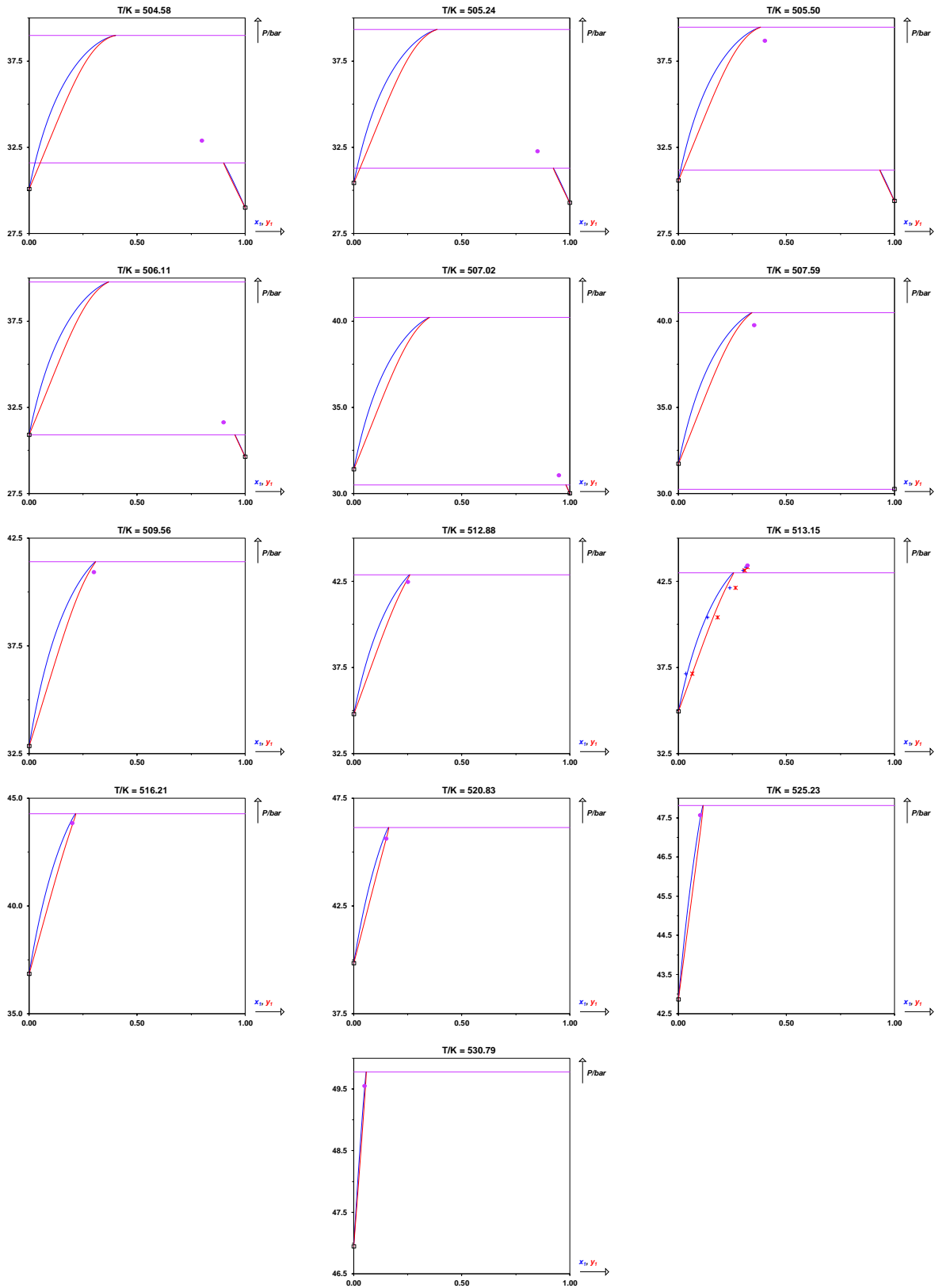
Gil, Laura - Blanco, Sofía T. - Rivas, Clara - Laga, Eduardo - Fernández, Javier - Artal, Manuela - Velasco, Inmaculada, Experimental determination of the critical loci for {n-C6H14 or CO2+alkan-1-ol} mixtures. Evaluation of their critical and subcritical behavior using PC-SAFT EoS, The Journal of Supercritical Fluids. 71 (2012) 26-44. doi:10.1016/j.supflu.2012.07.008

T / K	P / bar	x_1
502.81	35.41	0.6001
502.87	34.73	0.6497
502.90	36.12	0.5506
503.52	36.89	0.4999
503.82	33.46	0.7497
504.28	37.64	0.4501

SA-NA systems (BAC = 5)



SA-NA systems (BAC = 5)



ISOPROPANOL (1) + 2,2,4-TRIMETHYLPENTANE (2)

CAS	67-63-0	540-84-1
InChiKey	KFZMGEQAYNKOFK-UHFFFAOYSA-N	NHTMVDHEPJAVLT-UHFFFAOYSA-N
T_c / K	508.30	543.80
P_c / bar	47.65	25.70
ω	0.663	0.303

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 129.4$$

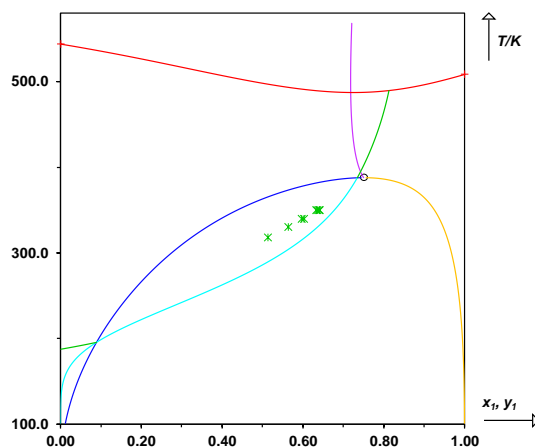
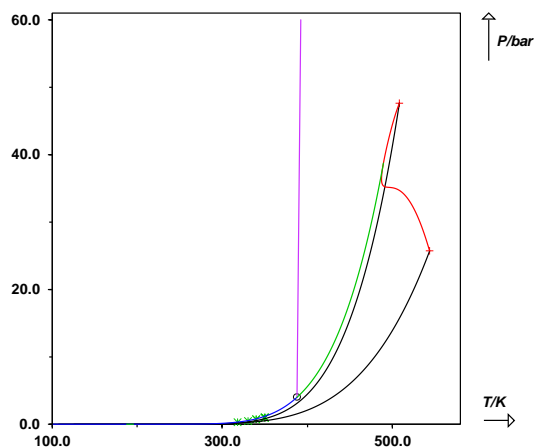
$$B/\text{MPa} = 89.30$$

Deviations

$$\text{MAPE on } x = 46 \%$$

$$\text{MAPE on } y = 15 \%$$

$$\text{MAPE on } h^M = 25 \%$$



Isothermal phase equilibrium data

Neau, Evelyne - Blanc, Claude - Bares, Daniel, Les fonctions thermodynamiques d'excès du binaire 2 propanol-isooctane, Journal de Chimie Physique. 70 (1973) 843-849. doi:10.1051/jcp/1973700843

T / K =	318.10		
P / bar	x ₁	y ₁	
0.2061	0.0180	0.2270	
0.2290	0.0430	0.3130	
0.2554	0.1400	0.4000	
0.2557	0.1520	0.4060	
0.2717	0.3328	0.4810	
0.2756	0.4150	0.4950	
0.2766	0.4920	0.5090	
0.2761	0.5125	0.5125	AZEO
0.2761	0.5140	0.5130	
0.2748	0.6200	0.5370	
0.2734	0.6580	0.5470	
0.2730	0.6660	0.5540	
0.2716	0.7030	0.5600	
0.2694	0.7300	0.5790	
0.2661	0.7740	0.5890	
0.2525	0.8540	0.6540	
0.2492	0.8740	0.6700	
0.2401	0.9020	0.7070	
0.2336	0.9220	0.7330	
0.2161	0.9550	0.8110	

Pavliček, Jan - Wichterle, Ivan, Isothermal (vapour+liquid) equilibria in the binary and ternary systems composed of 2-propanol, 2,2,4-trimethylpentane, and 2,4-dimethyl-3-pentanone, The Journal of Chemical Thermodynamics. 45 (2012) 83-89. doi:10.1016/j.jct.2011.09.007

T / K =	330.00		
P / bar	x ₁	y ₁	
0.2817	0.0066	0.1004	
0.3415	0.0259	0.2692	
0.3982	0.0797	0.3897	
0.4320	0.1739	0.4458	
0.4496	0.2737	0.4834	
0.4593	0.3859	0.5189	
0.4595	0.7036	0.6005	
0.4496	0.7922	0.6336	
0.4321	0.8649	0.6921	
0.4314	0.8665	0.6944	
0.4158	0.9051	0.7387	
0.3973	0.9365	0.7871	
0.3779	0.9586	0.8465	
0.3608	0.9754	0.8953	

0.3463 0.9883 0.9397
 0.3362 0.9958 0.9799

Wichterle, I., Isothermal vapor-liquid equilibria in the ternary system propan-2-ol + diisopropyl ether + 2,2,4-trimethylpentane and the three binary subsystems at 330 K and 340 K, ELDATA Int. Electron. J. Phys. Chem. Data. 5 (1999) 179-189.

T / K =	330.00		
P / bar	x ₁	y ₁	
0.3261	0.0142	0.2363	
0.3937	0.0673	0.3826	
0.4121	0.0994	0.4139	
0.4317	0.1585	0.4508	
0.4391	0.1924	0.4652	
0.4504	0.2640	0.4901	
0.4567	0.3257	0.5074	
0.4614	0.3810	0.5213	
0.4642	0.4346	0.5335	
0.4654	0.4863	0.5456	
0.4664	0.5630	0.5630	AZEO
0.4664	0.5699	0.5643	
0.4657	0.6144	0.5744	
0.4652	0.6559	0.5853	
0.4599	0.7327	0.6111	
0.4401	0.8472	0.6768	
0.4297	0.8770	0.7054	
0.4182	0.9036	0.7372	
0.4036	0.9288	0.7760	
0.3910	0.9465	0.8128	
0.3768	0.9623	0.8587	
0.3613	0.9789	0.9033	
0.3463	0.9907	0.9529	
0.3373	0.9977	0.9840	

Pavliček, Jan - Wichterle, Ivan, Isothermal (vapour+liquid) equilibria in the binary and ternary systems composed of 2-propanol, 2,2,4-trimethylpentane, and 2,4-dimethyl-3-pentanone, The Journal of Chemical Thermodynamics. 45 (2012) 83-89. doi:10.1016/j.jct.2011.09.007

T / K =	340.00		
P / bar	x ₁	y ₁	
0.4057	0.0080	0.1065	
0.5792	0.0873	0.3920	
0.6375	0.1646	0.4641	
0.6679	0.2636	0.5048	
0.6863	0.3782	0.5358	
0.6953	0.4823	0.5642	
0.6984	0.5955	0.5963	
0.6952	0.6949	0.6224	
0.6843	0.7882	0.6624	

SA-NA systems (BAC = 5)

0.6422	0.8960	0.7543		351.80	0.2460	0.5490	
0.6185	0.9299	0.7998		350.57	0.3660	0.5810	
0.5936	0.9510	0.8537		350.23	0.4320	0.5970	
0.5697	0.9721	0.9054		349.99	0.5210	0.6090	
0.5495	0.9860	0.9498		349.96	0.5330	0.6130	
0.5346	0.9956	0.9804		349.93	0.5490	0.6170	
				349.65	0.6080	0.6270	
Wichterle, I., Isothermal vapor-liquid equilibria in the ternary system propan-2-ol + diisopropyl ether + 2,2,4-trimethylpentane and the three binary subsystems at 330 K and 340 K, ELData Int. Electron. J. Phys. Chem. Data. 5 (1999) 179-189.				349.66	0.6320	0.6320	AZEO
				349.69	0.6400	0.6340	
				349.85	0.6930	0.6480	
				349.95	0.7350	0.6680	
T / K = 340.00				350.17	0.7870	0.6920	
P / bar	x₁	y₁		350.39	0.8050	0.7150	
0.5866	0.0808	0.4087		351.74	0.9110	0.7930	
0.6104	0.1113	0.4372		353.17	0.9530	0.8750	
0.6411	0.1706	0.4741					
0.6524	0.2012	0.4881		Hiaki, Toshihiko - Takahashi, Kenji - Tsuji, Tomoya - Hongo, Masaru - Kojima, Kazuo, Vapor-Liquid Equilibria of 1-Propanol or 2-Propanol with 2,2,4-Trimethylpentane at 101.3 kPa, Journal of Chemical & Engineering Data. 39 (1994) 602-604. doi:10.1021/jc00015a047			
0.6707	0.2698	0.5172					
0.6823	0.3281	0.5368					
0.6895	0.3796	0.5552					
0.6958	0.4338	0.5586		P / bar = 1.013			
0.6989	0.4830	0.5714		T / K	x₁	y₁	
0.7014	0.5297	0.5822		357.85	0.0737	0.3824	
0.7023	0.5628	0.5912		354.74	0.1209	0.4529	
0.7026	0.6020	0.6020	AZEO	353.44	0.1573	0.4847	
0.7027	0.6054	0.6011		352.09	0.2155	0.5135	
0.7018	0.6447	0.6150		351.64	0.2393	0.5234	
0.7003	0.6852	0.6243		351.12	0.2900	0.5479	
0.6616	0.8662	0.7193		350.54	0.3575	0.5685	
0.6482	0.8937	0.7522		350.04	0.4553	0.5910	
0.6314	0.9179	0.7835		349.80	0.4953	0.5994	
0.6142	0.9383	0.8199		349.75	0.5370	0.6039	
0.5950	0.9567	0.8600		349.58	0.5994	0.6226	
0.5510	0.9892	0.9528		349.58	0.6350	0.6350	AZEO
				349.63	0.6518	0.6415	
				349.74	0.6913	0.6538	
				349.81	0.7311	0.6632	
				349.90	0.7651	0.6773	
				350.10	0.7970	0.6981	
				350.54	0.8444	0.7358	
				351.52	0.9010	0.7999	
				352.84	0.9469	0.8725	
Isobaric phase equilibrium data							
Lin, Dun-Yi - Tu, Chein-Hsiun, (Vapour+liquid) equilibria for binary and ternary mixtures of 2-propanol, tetrahydropyran, and 2,2,4-trimethylpentane at P=101.3kPa, The Journal of Chemical Thermodynamics. 47 (2012) 260-266. doi:10.1016/j.jct.2011.10.025							
P / bar = 1.013							
T / K	x₁	y₁		Huang, Tzu-Te - Tu, Chein-Hsiun, Vapor-Liquid Equilibria for Binary and Ternary Mixtures of 1,3-Dioxolane, 2-Propanol, and 2,2,4-Trimethylpentane at 101.3 kPa, Journal of Chemical & Engineering Data. 55 (2010) 513-518. doi:10.1021/jc900327x			
361.23	0.0530	0.3100					
358.96	0.0730	0.3600					
356.86	0.0980	0.4160					
354.77	0.1380	0.4680		P / bar = 1.013			
353.35	0.1750	0.4990		T / K	x₁	y₁	

SA-NA systems (BAC = 5)

360.65	0.0580	0.3190		für physikalische Chemie. 85 (1981) 632-635.
358.30	0.0810	0.3820		doi:10.1002/bbpc.19810850905
356.27	0.1050	0.4230		T / K = 298.15
354.65	0.1320	0.4570		P / bar = 42.00
353.44	0.1670	0.4850		$h^M / J.mol^{-1}$ z_1
352.14	0.2320	0.5270		669.00 0.1640
350.80	0.3530	0.5650		791.00 0.3010
350.27	0.4120	0.5800		811.00 0.4180
350.06	0.5140	0.6060		765.00 0.5190
349.99	0.5230	0.6120		714.00 0.5900
349.94	0.5450	0.6140		693.00 0.6060
349.47	0.6130	0.6280		607.00 0.6830
349.67	0.6370	0.6390		511.00 0.7510
349.67	0.6400	0.6400	AZEO	494.00 0.7640
349.66	0.6420	0.6420	AZEO	412.00 0.8120
349.73	0.6840	0.6530		308.00 0.8660
349.82	0.7280	0.6600		203.00 0.9150
350.00	0.7800	0.6820		101.00 0.9600
350.31	0.8160	0.7020		
351.36	0.8940	0.7940		
352.94	0.9460	0.8780		

Enthalpy of mixing

Heintz, A., The Pressure Dependence of the Excess Enthalpy of Mixtures of Isopropanol with Heptane and Isooctane up to 553 bar, Berichte der Bunsengesellschaft für physikalische Chemie. 85 (1981) 632-635. doi:10.1002/bbpc.19810850905

T / K = 298.15

P / bar = 1.0000

$h^M / J.mol^{-1}$ z_1

678.00 0.1640

807.00 0.3010

819.00 0.4180

778.00 0.5190

727.00 0.5900

708.00 0.6060

620.00 0.6830

522.00 0.7510

507.00 0.7640

424.00 0.8120

314.00 0.8660

208.00 0.9150

103.00 0.9600

Heintz, A., The Pressure Dependence of the Excess Enthalpy of Mixtures of Isopropanol with Heptane and Isooctane up to 553 bar, Berichte der Bunsengesellschaft

Heintz, A., The Pressure Dependence of the Excess Enthalpy of Mixtures of Isopropanol with Heptane and Isooctane up to 553 bar, Berichte der Bunsengesellschaft für physikalische Chemie. 85 (1981) 632-635. doi:10.1002/bbpc.19810850905

T / K = 298.15

P / bar = 196.00

$h^M / J.mol^{-1}$ z_1

640.00 0.1620

751.00 0.2990

758.00 0.4160

716.00 0.5170

678.00 0.5880

652.00 0.6050

576.00 0.6820

488.00 0.7500

467.00 0.7630

385.00 0.8110

292.00 0.8660

189.00 0.9150

88.00 0.9600

Heintz, A., The Pressure Dependence of the Excess Enthalpy of Mixtures of Isopropanol with Heptane and Isooctane up to 553 bar, Berichte der Bunsengesellschaft für physikalische Chemie. 85 (1981) 632-635. doi:10.1002/bbpc.19810850905

T / K = 298.15

P / bar = 361.00

$h^M / J.mol^{-1}$ z_1

608.00 0.1600

718.00 0.2980

SA-NA systems (BAC = 5)

720.00	0.4150	1129.2	0.2406
674.00	0.5160	1145.1	0.2574
637.00	0.5870	1135.9	0.2815
609.00	0.6040	1188.6	0.3049
543.00	0.6810	1168.5	0.3252
453.00	0.7500	1202.9	0.3589
437.00	0.7630	1213.8	0.3805
368.00	0.8110	1225.1	0.4018
275.00	0.8660	1213.3	0.4564
176.00	0.9150	1192.8	0.4927
83.00	0.9600	1201.2	0.5061

Heintz, A., The Pressure Dependence of the Excess Enthalpy of Mixtures of Isopropanol with Heptane and Isooctane up to 553 bar, Berichte der Bunsengesellschaft für physikalische Chemie. 85 (1981) 632-635. doi:10.1002/bbpc.19810850905

T / K = 298.15

P / bar = 542.00

$h^M / J.mol^{-1}$

z_1

582.00	0.1560	998.13	0.6548
673.00	0.2950	920.68	0.6914
677.00	0.4130	904.35	0.7013
639.00	0.5140	757.81	0.7680
596.00	0.5860	679.52	0.7992
570.00	0.6030	484.83	0.8640
507.00	0.6810	344.99	0.9066
424.00	0.7500	195.94	0.9483
411.00	0.7630		
337.00	0.8110		
253.00	0.8660		
161.00	0.9160		
70.00	0.9610		

Neau, Evelyne - Blanc, Claude - Bares, Daniel, Les fonctions thermodynamiques d'excès du binaire 2 propanol-isooctane, Journal de Chimie Physique. 70 (1973) 843-849. doi:10.1051/jcp/1973700843

T / K = 338.10

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$

x_1

Neau, Evelyne - Blanc, Claude - Bares, Daniel, Les fonctions thermodynamiques d'excès du binaire 2 propanol-isooctane, Journal de Chimie Physique. 70 (1973) 843-849. doi:10.1051/jcp/1973700843

T / K = 318.14

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$

x_1

239.90	0.0116	736.04	0.0493
319.87	0.0165	978.46	0.0753
405.70	0.0228	1158.1	0.1055
644.35	0.0502	1288.3	0.1440
711.34	0.0610	1395.0	0.1771
771.21	0.0792	1501.0	0.2145
869.18	0.1058	1506.4	0.2424
962.55	0.1425	1554.6	0.2591
1033.3	0.1768	1568.0	0.2778
1067.2	0.2066	1592.7	0.3036

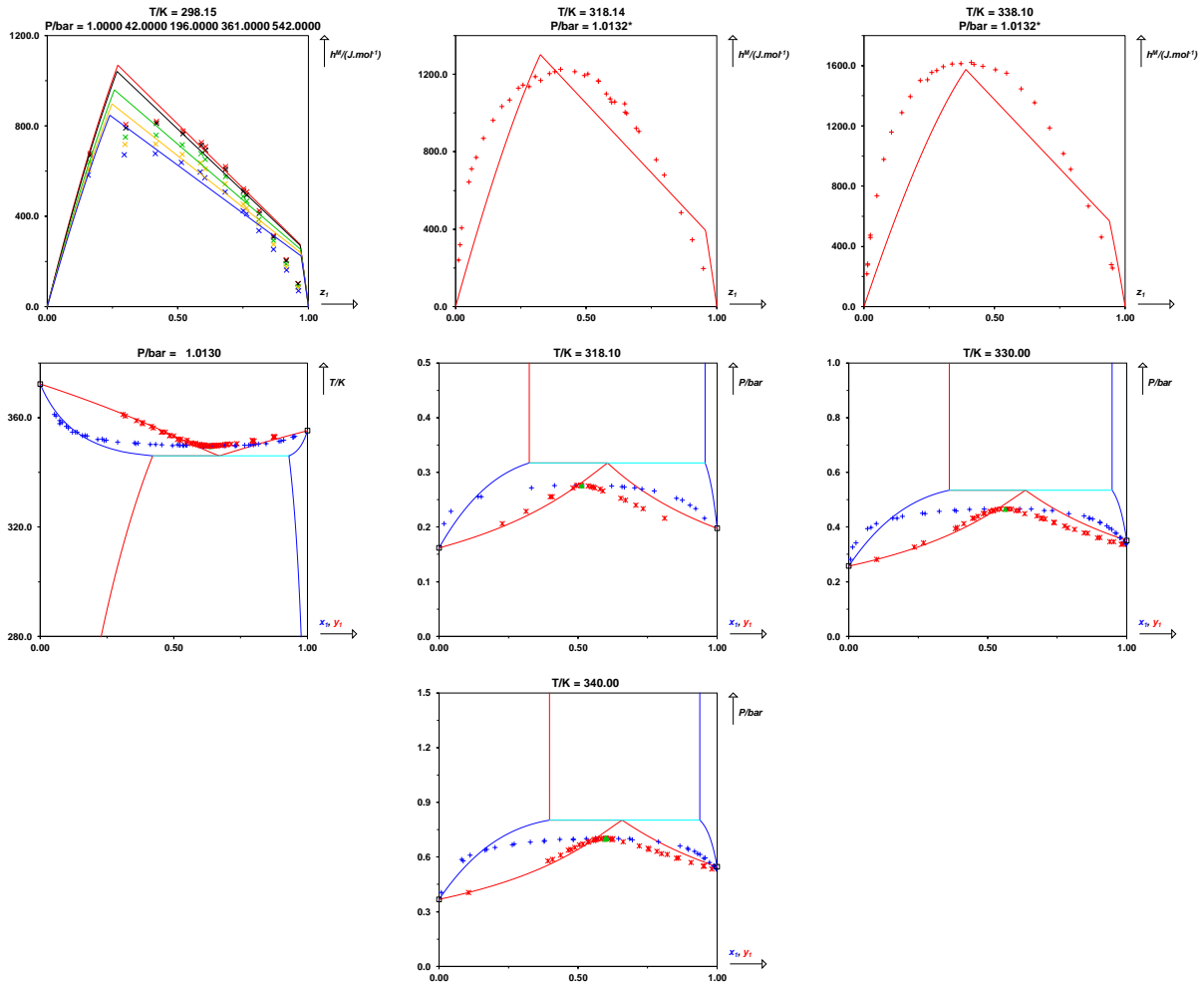
1611.5	0.3374
1613.6	0.3713
1620.7	0.4112
1609.8	0.4214
1596.8	0.4554
1573.8	0.5028
1550.0	0.5460
1446.1	0.6013
1353.6	0.6529
1187.4	0.7105
1015.3	0.7637
910.63	0.7912
667.38	0.8592
460.55	0.9091
278.84	0.9472
254.98	0.9515

Azeotropic point

Zhang, Lianzhong - Han, Jianzhi - Wang, Rongjie - Qiu, Xingying - Ji, Jianbing, Isobaric Vapor-Liquid Equilibria for Three Ternary Systems: Water + 2-Propanol + 1-Ethyl-3-methylimidazolium Tetrafluoroborate, Water + 1-Propanol + 1-Ethyl-3-methylimidazolium Tetrafluoroborate, and Water + 1-Propanol + 1-Butyl-3-methylimidazolium Tetrafluoroborate, Journal of Chemical & Engineering Data. 52 (2007) 1401-1407. doi:10.1021/je700092d

T / K	P / bar	x_1
340.00	0.6984	0.5967

SA-NA systems (BAC = 5)



DIETHYLAMINE (1) + BENZENE (2)

CAS	109-89-7	71-43-2
InChiKey	HPNMFZURTQLUMO-UHFFFAOYSA-N	UHOVQNZJYSORNB-UHFFFAOYSA-N
T_c / K	496.60	562.05
P_c / bar	37.10	48.95
ω	0.304	0.210

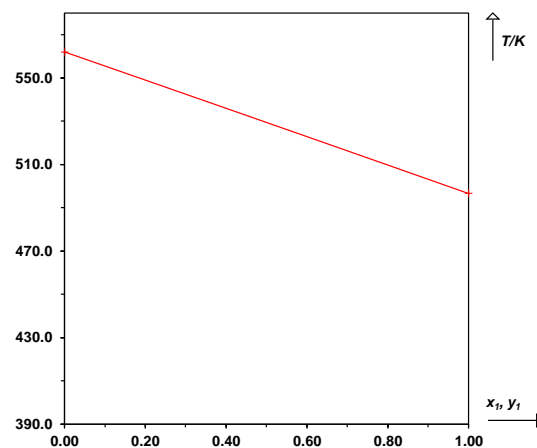
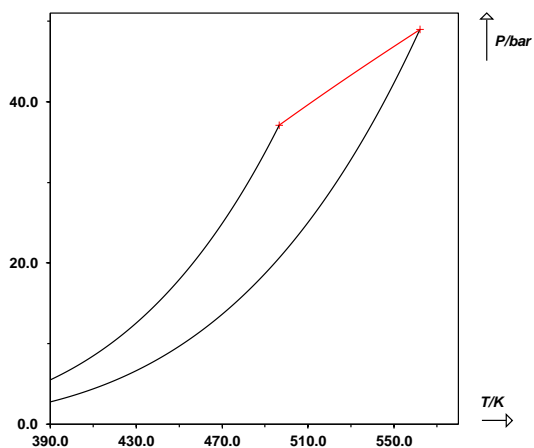
Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

 $A/\text{MPa} = 5.191$ $B/\text{MPa} = 32.76$

Deviations

MAPE on $x = 5.9\%$ MAPE on $y = 5.8\%$ MAPE on $h^M = 12\%$ 

Isothermal phase equilibrium data

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 308.15		
P / bar	x ₁	y ₁
0.2080	0.0310	0.0760
0.2277	0.0930	0.2070
0.2333	0.1110	0.2410
0.2660	0.2160	0.4080
0.3000	0.3310	0.5490
0.3133	0.3770	0.5970
0.3334	0.4480	0.6620
0.3602	0.5440	0.7400
0.3816	0.6240	0.7950
0.4042	0.7060	0.8460
0.4234	0.7810	0.8870
0.4397	0.8480	0.9210
0.4534	0.9000	0.9480

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 328.15		
P / bar	x ₁	y ₁
0.4668	0.0470	0.1060
0.4930	0.0880	0.1880
0.5241	0.1380	0.2750
0.5336	0.1550	0.3020
0.5601	0.1980	0.3665
0.6520	0.3540	0.5590
0.6662	0.3800	0.5850
0.7133	0.4620	0.6620
0.7387	0.5070	0.6990
0.7737	0.5700	0.7480
0.8533	0.7140	0.8430
0.9205	0.8410	0.9150
0.9389	0.8750	0.9340

Isobaric phase equilibrium data

Siedler, R. - Grote, L. - Kauert, E. - Werner, U. - Bittrich, H. J., Zur Thermodynamik der binären Systeme von Benzol mit Diäthylamin und Triäthylamin, Zeitschrift für Physikalische Chemie. 2410 (1969) doi:10.1515/zpch-1969-24127

P / bar = 1.013		
T / K	x ₁	y ₁
351.55	0.0420	0.0830
350.55	0.0820	0.1500
348.65	0.1250	0.2290
346.95	0.1750	0.3060
343.85	0.2700	0.4280
342.45	0.2990	0.4810
339.15	0.4310	0.6280
339.25	0.4320	0.6150
335.65	0.5870	0.7500
334.95	0.6230	0.7800
332.75	0.7340	0.8600
331.85	0.7850	0.8920
330.75	0.8490	0.9230
329.95	0.9000	0.9540

Enthalpy of mixing

Siedler, R. - Grote, L. - Kauert, E. - Werner, U. - Bittrich, H. J., Zur Thermodynamik der binären Systeme von Benzol mit Diäthylamin und Triäthylamin, Zeitschrift für Physikalische Chemie. 2410 (1969) doi:10.1515/zpch-1969-24127

T / K = 293.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
335.00	0.2290
385.00	0.3400
429.00	0.4500
433.00	0.5050
426.00	0.5410
424.00	0.5450
344.00	0.7150
297.00	0.7640
280.00	0.7670

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
236.00	0.2070
335.00	0.3660
333.00	0.4690
294.00	0.6220
232.00	0.7640
180.00	0.7990

Velasco, I. - Otin, S. - Gutierrez Losa, C., Excess Enthalpies of Some Aliphatic Amine (C3 - C8) + Benzene Mixtures, Int. Data Ser. Sel. Data Mixtures Ser. A. (1981) 60-64.

T / K = 303.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1
60.00	0.0499
166.00	0.1388
193.00	0.1704
248.00	0.2520
260.00	0.2826
304.00	0.3890
307.00	0.4757
308.00	0.5494
255.00	0.6660
199.00	0.7720
143.00	0.8549

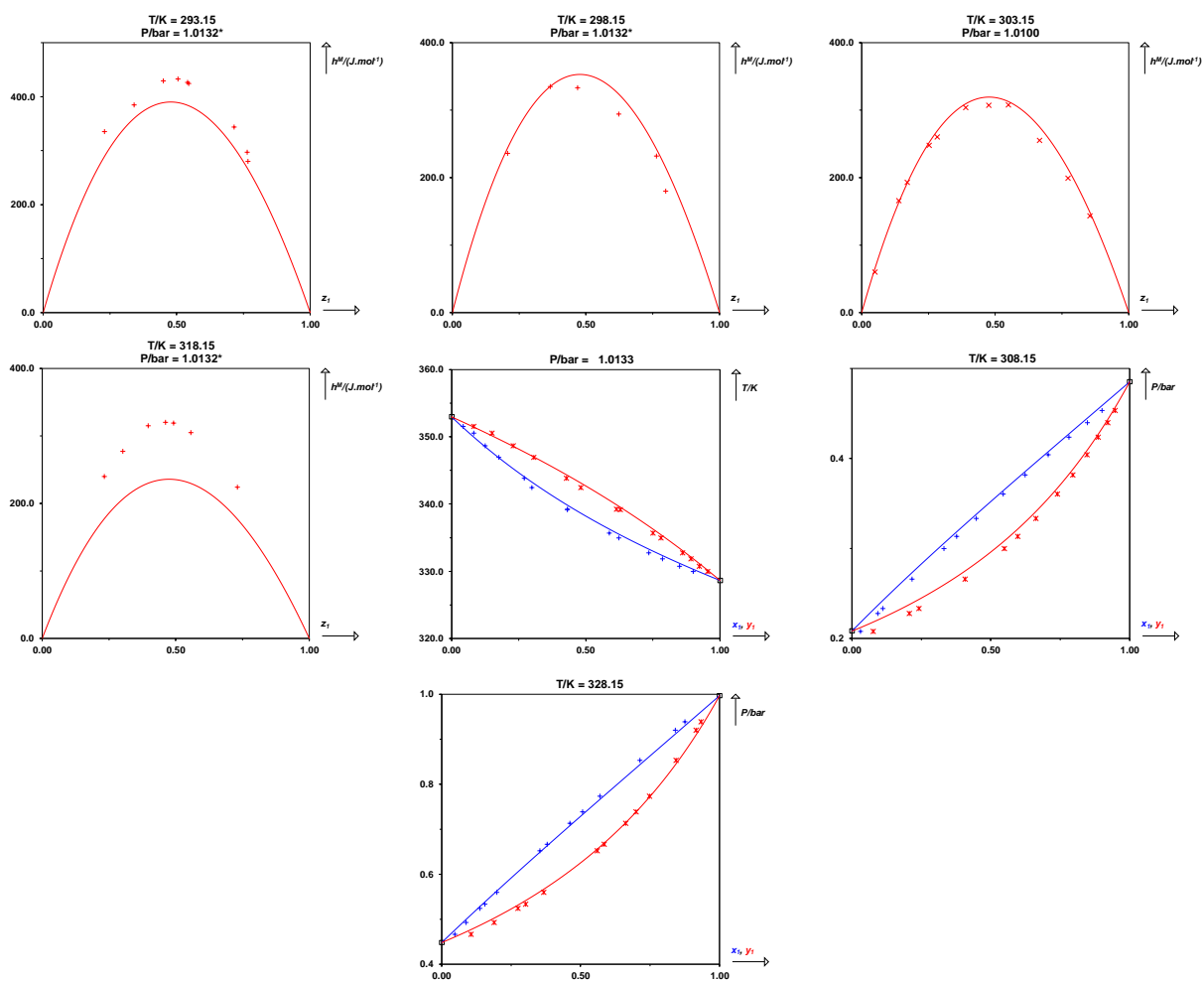
Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
240.00	0.2330
277.00	0.3010
315.00	0.3960
320.00	0.4620
319.00	0.4920
305.00	0.5560
224.00	0.7310

SA-NA systems (BAC = 5)



DIETHYLAMINE (1) + MONOCHLOROBENZENE (2)

CAS	109-89-7	108-90-7
InChiKey	HPNMFZURTQLUMO-UHFFFAOYSA-N	MVPPADPHJFYWMZ-UHFFFAOYSA-N
T_c / K	496.60	632.35
P_c / bar	37.10	45.19
ω	0.304	0.250

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 2.191$

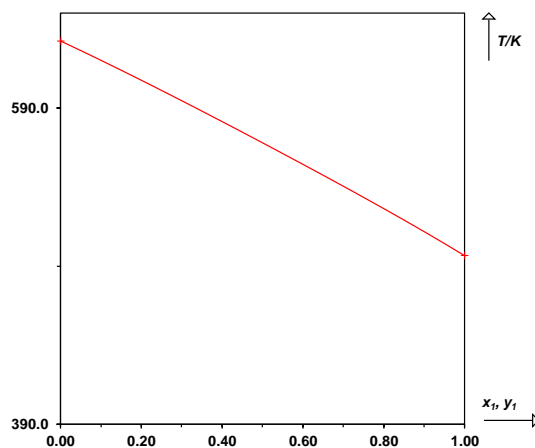
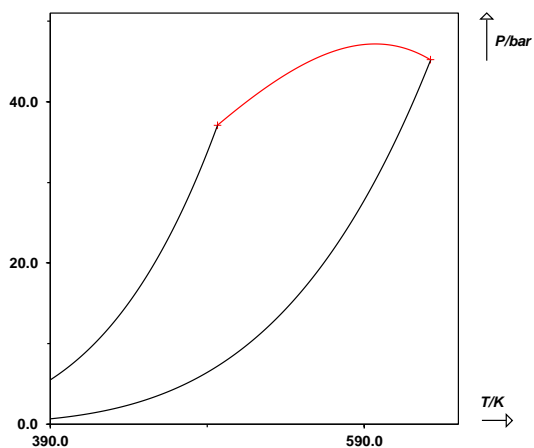
$B/\text{MPa} = -5.813$

Deviations

MAPE on $x = 1.8\%$

MAPE on $y = 2.7\%$

MAPE on $h^M = 3.4\%$



-----				0.5248	0.3820	0.8910
Isothermal phase equilibrium data				0.5336	0.3900	0.8940
-----				0.5621	0.4150	0.9030
Dehmelt, Ch. - Finke, M. - Bittrich, H. J., Untersuchungen zur zwischenmolekularen Wechselwirkung in Systemen von Diäthylamin mit aromatischen Komponenten, Zeitschrift für Physikalische Chemie. 2550 (1974) doi:10.1515/zpch-1974-25533				0.6053	0.4550	0.9155
T / K = 308.15				0.6484	0.4920	0.9255
P / bar	x ₁	y ₁		0.6835	0.5260	0.9335
0.0813	0.1250	0.6950		0.7337	0.5770	0.9445
0.1636	0.2975	0.8835		0.7870	0.6220	0.9530
0.2329	0.4540	0.9400		0.8327	0.6650	0.9600
0.3363	0.6875	0.9785		0.8958	0.7250	0.9690
0.4047	0.8300	0.9925		0.9330	0.7600	0.9730
				1.000	0.8210	0.9810

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 313.15			
P / bar	x ₁	y ₁	
0.1763	0.2390	0.8450	
0.2055	0.2920	0.8760	
0.2308	0.3370	0.8960	
0.2513	0.3740	0.9090	
0.2673	0.4030	0.9180	
0.2861	0.4360	0.9280	
0.3338	0.5230	0.9470	
0.3694	0.5900	0.9580	
0.3864	0.6210	0.9625	
0.4073	0.6610	0.9675	
0.4601	0.7600	0.9790	
0.4974	0.8320	0.9860	
0.5212	0.8780	0.9900	

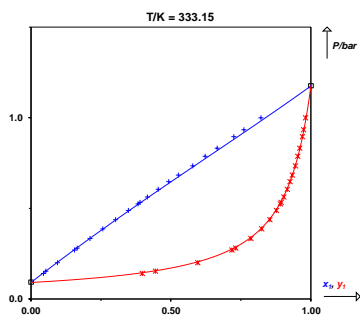
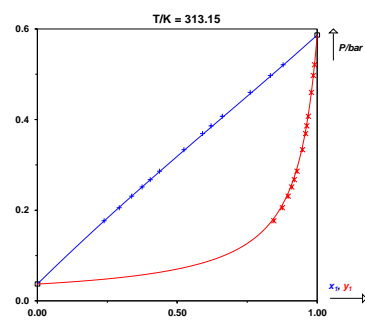
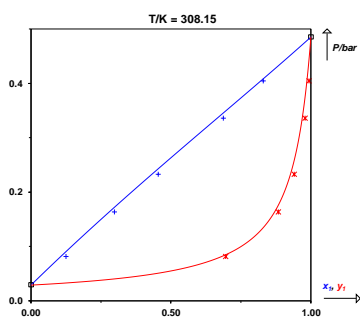
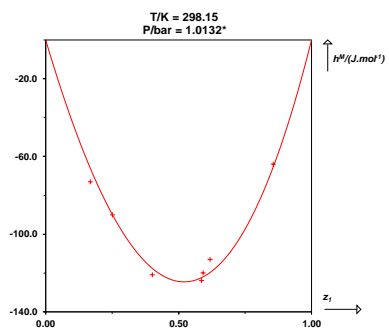
Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 333.15			
P / bar	x ₁	y ₁	
0.1415	0.0445	0.3980	
0.1525	0.0530	0.4450	
0.2003	0.0950	0.5950	
0.2701	0.1550	0.7180	
0.2814	0.1650	0.7320	
0.3334	0.2110	0.7850	
0.3857	0.2570	0.8240	
0.4368	0.3020	0.8535	
0.4880	0.3480	0.8765	

Enthalpy of mixing

Bayles, John W. - Letcher, Trevor M., Thermodynamics of some binary liquid mixtures containing aliphatic amines, Journal of Chemical & Engineering Data. 16 (1971) 266-271. doi:10.1021/je60050a026

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
-73.00	0.1670
-90.00	0.2510
-121.00	0.4010
-124.00	0.5860
-120.00	0.5920
-113.00	0.6180
-64.00	0.8560



2-BUTANOL (1) + CYCLOHEXANE (2)

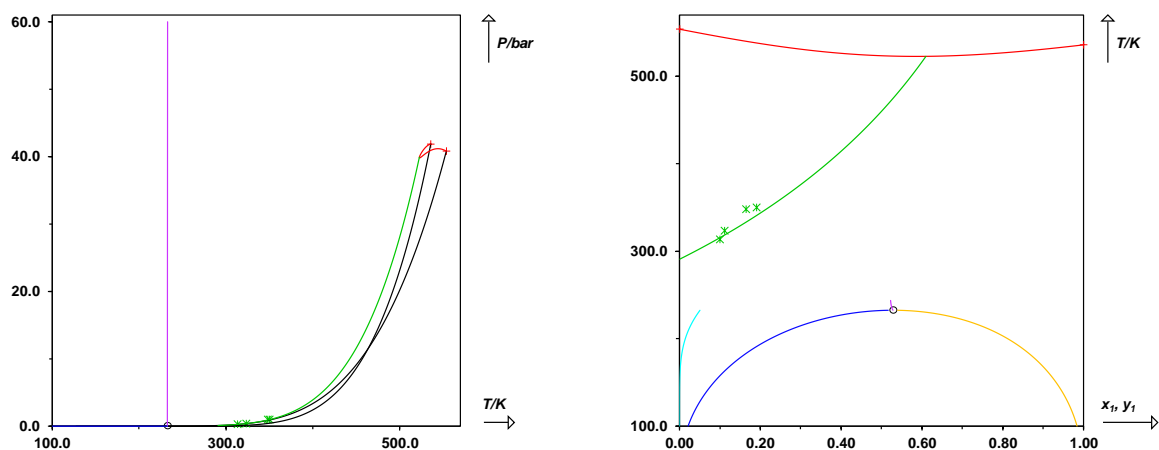
CAS	78-92-2	110-82-7
InChiKey	BTANRVKWKQNVYAZ-UHFFFAOYSA-N	XDTMQSROBMDMFD-UHFFFAOYSA-N
T_c / K	535.90	553.80
P_c / bar	41.89	40.80
ω	0.581	0.208

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

A/MPa = 81.56

B/MPa = 64.71

*Deviations*MAPE on x = 16 %MAPE on y = 14 %MAPE on x_{az} = 10 %MAPE on P_{az} = 3.7 %MAPE on h^M = 35 %

Isothermal phase equilibrium data

Belabbaci, Aouicha - Villamañán, Rosa M. - Negadi, Latifa - Martín, M. Carmen, Vapor–Liquid Equilibria of Binary Mixtures Containing 2-Butanol and Hydrocarbons at 313.15 K, *Journal of Chemical & Engineering Data*. 57 (2012) 982-987. doi:10.1021/je201284y

T / K = 313.15

P / bar	x ₁	y ₁	
0.1022	0.9497	0.5665	
0.1350	0.9001	0.4102	
0.1609	0.8504	0.3305	
0.1811	0.8007	0.2826	
0.1972	0.7508	0.2503	
0.2100	0.7009	0.2270	
0.2203	0.6508	0.2093	
0.2530	0.3500	0.1492	
0.2559	0.3002	0.1411	
0.2584	0.2499	0.1329	
0.2602	0.2002	0.1248	
0.2613	0.1501	0.1166	
0.2603	0.0999	0.0999	AZEO
0.2617	0.0999	0.1063	
0.2601	0.0498	0.0844	

Araujo, M.E. - Maciel, M.R.W. - Francesconi, A.Z., Excess Gibbs free energies of (hexane + butan-2-ol) and of (cyclohexane + butan-2-ol) at the temperatures (323.15, 338.15, and 348.15) K, *The Journal of Chemical Thermodynamics*. 25 (1993) 1295-1299. doi:10.1006/jcht.1993.1129

T / K = 323.15

P / bar	x ₁	y ₁	
0.2698	0.8020	0.3550	
0.2879	0.7560	0.3220	
0.3091	0.7130	0.2880	
0.3340	0.6720	0.2560	
0.3409	0.6330	0.2450	
0.3549	0.5960	0.2250	
0.3591	0.5590	0.2150	
0.3713	0.4900	0.1940	
0.3775	0.4550	0.1830	
0.3812	0.4220	0.1650	
0.3879	0.2880	0.1380	
0.3946	0.1110	0.1110	AZEO
0.3930	0.0360	0.0860	

Araujo, M.E. - Maciel, M.R.W. - Francesconi, A.Z., Excess Gibbs free energies of (hexane + butan-2-ol) and of (cyclohexane + butan-2-ol) at the temperatures (323.15, 338.15, and 348.15) K, *The Journal of Chemical*

Thermodynamics. 25 (1993) 1295-1299. doi:10.1006/jcht.1993.1129

T / K = 348.15

P / bar	x ₁	y ₁	
0.5026	0.9440	0.8490	
0.6045	0.8970	0.7130	
0.7677	0.8020	0.5240	
0.7927	0.7800	0.4880	
0.8629	0.7130	0.3880	
0.8894	0.6720	0.3550	
0.9192	0.5960	0.3220	
0.9383	0.5240	0.2880	
0.9823	0.2880	0.1940	
0.9866	0.1650	0.1650	AZEO
0.9813	0.0860	0.1380	
0.9749	0.0610	0.1110	
0.9405	0.0360	0.0860	

Isobaric phase equilibrium data

Gascón, I. - Artigas, H. - Cea, P. - Domínguez, M. - Royo, F.M., Isobaric Vapour-Liquid Equilibrium of Ternary Mixtures Cyclohexane (or n -Hexane) Plus 1,3-Dioxolane Plus 2-Butanol at 40.0 and 101.3 kPa, *Physics and Chemistry of Liquids*. 41 (2003) 1-13. doi:10.1080/00319100290032703

P / bar = 0.4000

T / K	x ₁	y ₁
338.05	0.8910	0.5300
336.00	0.8530	0.4670
332.40	0.7930	0.3710
331.12	0.7510	0.3440
329.16	0.6840	0.2950
327.17	0.5600	0.2500
326.18	0.4900	0.2280
325.79	0.4420	0.2200
325.20	0.3650	0.1970
324.77	0.2820	0.1830
324.40	0.1940	0.1590
324.38	0.1340	0.1480

Feng, Li-Chia - Chou, Chih-Hao - Tang, Muoi - Chen, Yan-Ping, Vapor–Liquid Equilibria of Binary Mixtures 2-Butanol + Butyl Acetate, Hexane + Butyl Acetate, and Cyclohexane + 2-Butanol at 101.3 kPa, *Journal of Chemical & Engineering Data*. 43 (1998) 658-661. doi:10.1021/je9800205

P / bar = 1.013

T / K	x ₁	y ₁
368.41	0.9636	0.8385
366.76	0.9457	0.7787

Journal of Solution Chemistry. 12 (1983) 869-887.
doi:10.1007/BF00643927

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$

x_1

31.91 0.9900

63.56 0.9800

156.94 0.9500

306.09 0.9000

576.48 0.8000

800.31 0.7000

966.96 0.6000

1064.5 0.5000

1088.2 0.4000

1035.1 0.3000

910.08 0.2000

876.01 0.1800

837.85 0.1600

796.08 0.1400

749.55 0.1200

696.69 0.1000

650.82 0.0850

598.99 0.0700

514.90 0.0500

463.49 0.0400

400.42 0.0300

325.16 0.0200

260.78 0.0150

195.72 0.0100

145.62 0.0070

107.26 0.0050

86.89 0.0040

65.86 0.0030

44.27 0.0020

22.28 0.0010

Veselý, František - Dohnal, Vladimír - Valentová, Miriam - Pick, Jiří, Concentration and temperature dependence of heats of mixing of 1-butanol, 2-butanol, and 2-methyl-2-propanol with cyclohexane, Collection of Czechoslovak Chemical Communications. 48 (1983) 3482-3494. doi:10.1135/cccc19833482

T / K = 313.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$

x_1

263.60 0.9203

477.50 0.8508

619.20 0.7928

729.70 0.7535

828.00 0.7125

913.60 0.6612

931.80 0.6575

1000.7 0.6137

1036.8 0.5880

1073.4 0.5592

1103.7 0.5295

1129.4 0.4986

1148.2 0.4650

1157.5 0.4172

1153.7 0.3918

1146.2 0.3691

1132.3 0.3402

1112.6 0.3197

1085.7 0.2861

1062.6 0.2660

1021.7 0.2345

982.40 0.2084

935.10 0.1808

885.00 0.1561

766.00 0.1063

605.90 0.0605

Veselý, František - Dohnal, Vladimír - Valentová, Miriam - Pick, Jiří, Concentration and temperature dependence of heats of mixing of 1-butanol, 2-butanol, and 2-methyl-2-propanol with cyclohexane, Collection of Czechoslovak Chemical Communications. 48 (1983) 3482-3494. doi:10.1135/cccc19833482

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$

x_1

252.10 0.9300

502.00 0.8533

659.90 0.7953

772.30 0.7542

850.30 0.7203

895.00 0.7058

969.80 0.6614

983.00 0.6579

1046.7 0.6213

1107.8 0.5800

1133.8 0.5620

1167.0 0.5362

1194.9 0.5018

1201.8 0.4883

1217.0 0.4604

1221.0 0.4302

1227.3 0.4204

1222.4 0.4003

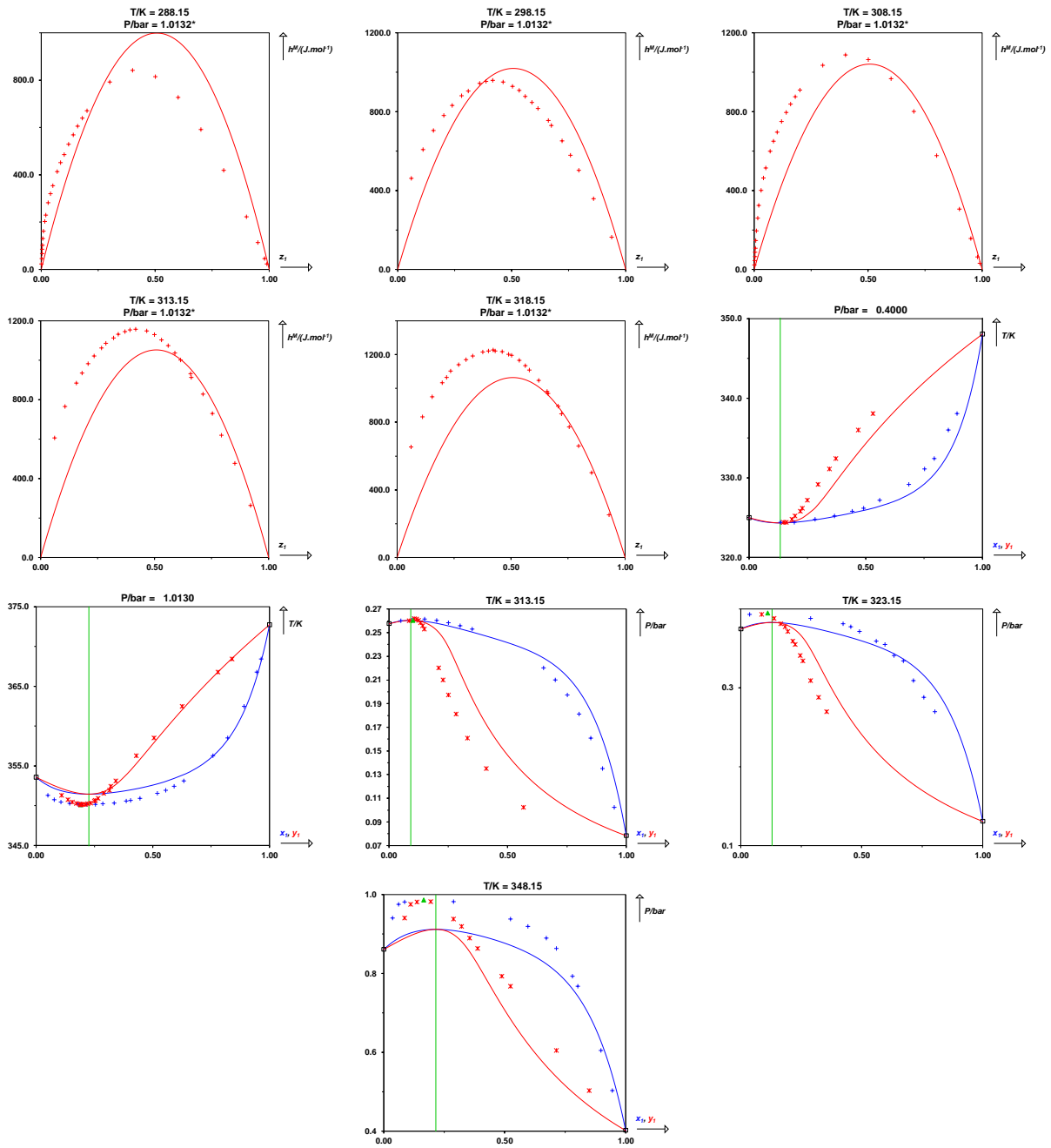
1215.0 0.3758

1190.9 0.3320

SA-NA systems (BAC = 5)

1170.3	0.3018
1140.4	0.2691
1102.4	0.2347
1065.8	0.2168
1033.0	0.1982
951.30	0.1542
832.40	0.1105
654.50	0.0612

SA-NA systems (BAC = 5)



CARBON DIOXIDE (1) + DIFLUOROMETHANE (2)

CAS	124-38-9	75-10-5
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	RWRIWBAlICGTTQ-UHFFFAOYSA-N
T_c / K	304.21	351.26
P_c / bar	73.83	57.84
ω	0.224	0.277

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 26.31$

$B/\text{MPa} = 10.42$

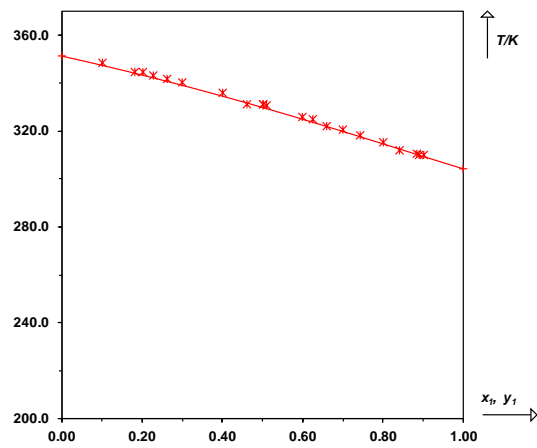
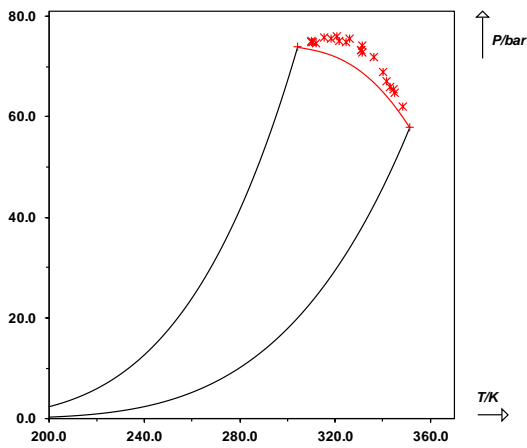
Deviations

MAPE on $x = 4.3\%$

MAPE on $y = 3.1\%$

MAPE on $x_c = 4.7\%$

MAPE on $P_c = 4.5\%$



-----			20.53	0.6330	0.8470
Isothermal phase equilibrium data			23.02	0.7470	0.8950
-----			25.06	0.8310	0.9320
Stein, Fred Paul. - Adams, Robert A., Vapor-liquid equilibria for carbon dioxide-difluoromethane system, Journal of Chemical & Engineering Data. 16 (1971) 146-149. doi:10.1021/je60049a015			26.65	0.8980	0.9590
T / K = 222.04			28.17	0.9605	0.9810
P / bar	x ₁	y ₁	Rivollet, F - Chapoy, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the carbon dioxide (CO ₂) + difluoromethane (R32) system at temperatures from 283.12 to 343.25 K and pressures up to 7.46 MPa, Fluid Phase Equilibria. 218 (2004) 95-101. doi:10.1016/j.fluid.2003.12.002		
1.145	0.0199	0.1010	T / K = 305.15		
1.296	0.0440	0.2130	P / bar	x ₁	y ₁
1.703	0.1240	0.4470	23.56	0.0720	0.1530
2.082	0.1990	0.5870	34.50	0.2840	0.4770
2.799	0.3240	0.7370	44.16	0.4680	0.6500
3.523	0.4580	0.8250	56.39	0.6850	0.7960
4.158	0.5640	0.8820	66.02	0.8540	0.8960
4.826	0.6880	0.9240	69.05	0.9050	0.9280
5.571	0.8220	0.9609	Rivollet, F - Chapoy, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the carbon dioxide (CO ₂) + difluoromethane (R32) system at temperatures from 283.12 to 343.25 K and pressures up to 7.46 MPa, Fluid Phase Equilibria. 218 (2004) 95-101. doi:10.1016/j.fluid.2003.12.002		
5.785	0.8640	0.9694	T / K = 313.30		
6.143	0.9270	0.9822	P / bar	x ₁	y ₁
Stein, Fred Paul. - Adams, Robert A., Vapor-liquid equilibria for carbon dioxide-difluoromethane system, Journal of Chemical & Engineering Data. 16 (1971) 146-149. doi:10.1021/je60049a015			26.16	0.0250	0.0530
T / K = 244.26			49.94	0.4280	0.5880
P / bar	x ₁	y ₁	60.91	0.6020	0.7160
3.082	0.0190	0.0790	70.60	0.7490	0.8010
3.413	0.0480	0.1830	71.70	0.7660	0.8110
3.751	0.0730	0.2750	73.18	0.7880	0.8220
4.475	0.1350	0.4240	Rivollet, F - Chapoy, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the carbon dioxide (CO ₂) + difluoromethane (R32) system at temperatures from 283.12 to 343.25 K and pressures up to 7.46 MPa, Fluid Phase Equilibria. 218 (2004) 95-101. doi:10.1016/j.fluid.2003.12.002		
5.233	0.1970	0.5400	T / K = 323.34		
6.592	0.3130	0.6760	P / bar	x ₁	y ₁
7.936	0.4290	0.7710	32.99	0.0250	0.0480
9.570	0.5600	0.8470	42.26	0.1680	0.2760
11.11	0.6890	0.9040	55.37	0.3630	0.4850
12.44	0.7980	0.9420	67.38	0.5250	0.6120
13.36	0.8830	0.9651	71.82	0.5820	0.6440
14.07	0.9440	0.9819	72.93	0.5970	0.6500
Stein, Fred Paul. - Adams, Robert A., Vapor-liquid equilibria for carbon dioxide-difluoromethane system, Journal of Chemical & Engineering Data. 16 (1971) 146-149. doi:10.1021/je60049a015			74.64	0.6250	0.6560
T / K = 266.48			Rivollet, F - Chapoy, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the carbon dioxide (CO ₂) + difluoromethane (R32) system at temperatures from 283.12 to 343.25 K and pressures up to 7.46 MPa, Fluid Phase Equilibria. 218 (2004) 95-101. doi:10.1016/j.fluid.2003.12.002		
P / bar	x ₁	y ₁	T / K = 323.34		
6.874	0.0138	0.0510	P / bar	x ₁	y ₁
10.30	0.1730	0.4420	32.99	0.0250	0.0480
12.08	0.2520	0.5560	42.26	0.1680	0.2760
13.58	0.3200	0.6280	55.37	0.3630	0.4850
18.85	0.5670	0.8040	67.38	0.5250	0.6120
			71.82	0.5820	0.6440
			72.93	0.5970	0.6500
			74.64	0.6250	0.6560

Rivollet, F - Chapoy, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the carbon dioxide (CO₂) + difluoromethane (R32) system at temperatures from 283.12 to 343.25 K and pressures up to 7.46 MPa, Fluid Phase Equilibria. 218 (2004) 95-101. doi:10.1016/j.fluid.2003.12.002

T / K = 333.33

P / bar	x ₁	y ₁
41.70	0.0310	0.0520
67.10	0.3690	0.4340
70.87	0.4190	0.4640
71.91	0.4330	0.4650

Rivollet, F - Chapoy, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the carbon dioxide (CO₂) + difluoromethane (R32) system at temperatures from 283.12 to 343.25 K and pressures up to 7.46 MPa, Fluid Phase Equilibria. 218 (2004) 95-101. doi:10.1016/j.fluid.2003.12.002

T / K = 343.23

P / bar	x ₁	y ₁
54.27	0.0690	0.0880
58.52	0.1190	0.1540
62.50	0.1670	0.2010
65.19	0.2040	0.2290
65.89	0.2170	0.2280

Critical point

Rivollet, F - Chapoy, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the carbon dioxide (CO₂) + difluoromethane (R32) system at temperatures from 283.12 to 343.25 K and pressures up to 7.46 MPa, Fluid Phase Equilibria. 218 (2004) 95-101. doi:10.1016/j.fluid.2003.12.002

T / K	P / bar	x ₁
309.82	74.97	0.9000
315.33	75.77	0.8000
320.68	75.98	0.7000
325.95	75.48	0.6000
331.09	74.11	0.5000
336.00	71.87	0.4000
340.04	68.82	0.3000
344.47	65.53	0.2000
348.25	61.96	0.1000

Diefenbacher, A. - Türk, M., (Vapour+liquid) Equilibria of binary mixtures of CO₂, CH₂F₂, CHF₃, and SF₆, The Journal of Chemical Thermodynamics. 34 (2002) 1361-1375. doi:10.1016/S0021-9614(02)00123-4

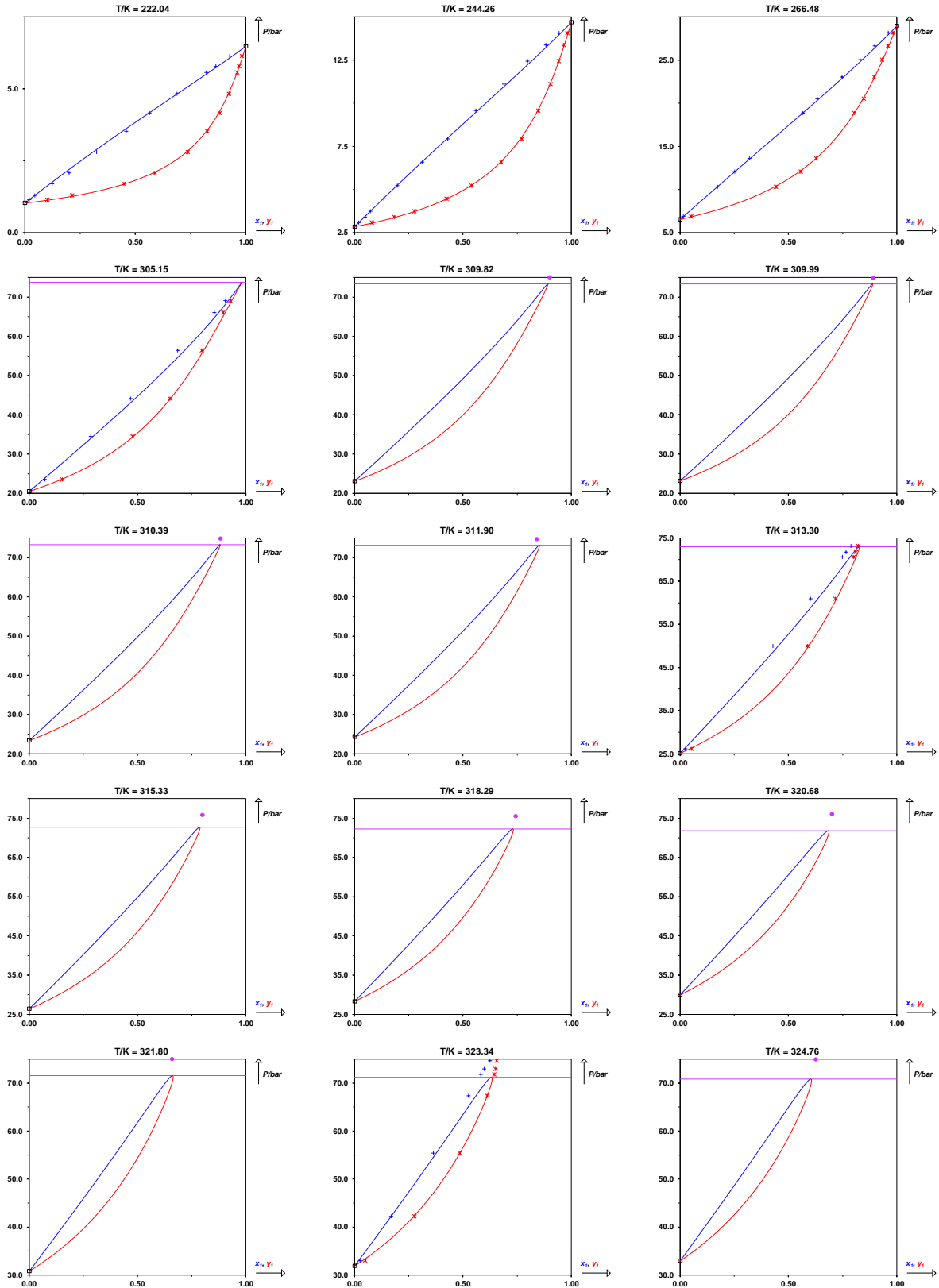
T / K	P / bar	x ₁
309.99	74.75	0.8910

310.39	74.81	0.8830
318.29	75.47	0.7430
324.76	74.91	0.6260
330.71	73.27	0.5090
330.95	73.17	0.5010
341.63	67.06	0.2630
343.09	65.86	0.2260

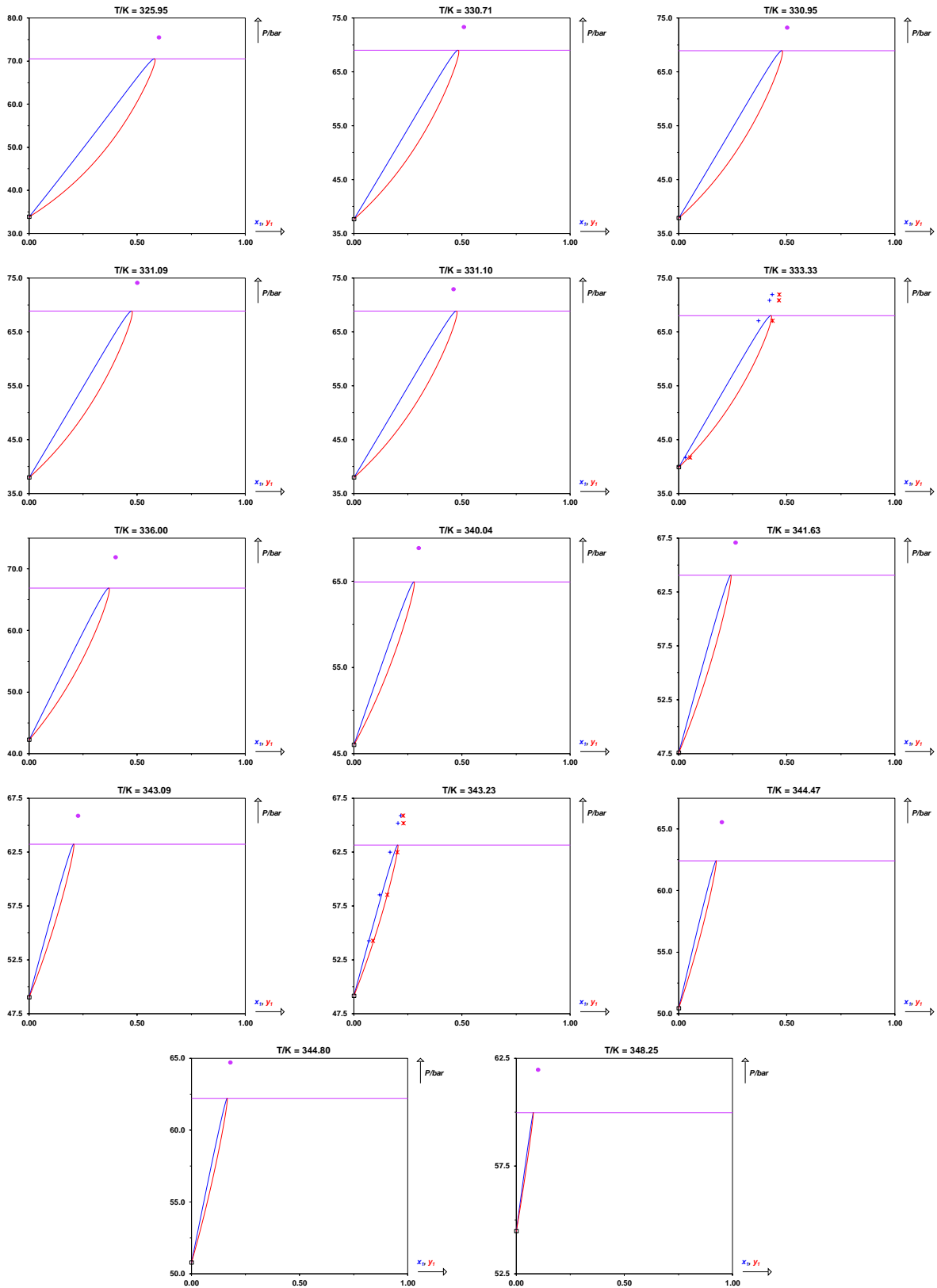
Kordikowski, Andreas - Robertson, Duncan G. - Poliakoff, Martyn - DiNoia, Todd D. - McHugh, Mark - Aguiar-Ricardo, Ana, Acoustic Determination of the Critical Surfaces in the Ternary Systems CO₂ + CH₂F₂ + CF₃CH₂F and CO + C₂H₄ + CH₃CH₂CH₃ and in Their Binary Subsystems, The Journal of Physical Chemistry B. 101 (1997) 5853-5862. doi:10.1021/jp963061l

T / K	P / bar	x ₁
311.90	74.70	0.8400
321.80	75.00	0.6600
331.10	72.90	0.4600
344.80	64.70	0.1800

HD-HA systems (BAC = 6)



HD-HA systems (BAC = 6)



DIFLUOROMETHANE (1) + SULFUR DIOXIDE (2)

CAS	75-10-5	7446-09-5
InChiKey	RWRIWBAlICGTTQ-UHFFFAOYSA-N	RAHZWNYVWXNFOC-UHFFFAOYSA-N
T_c / K	351.26	430.75
P_c / bar	57.84	78.84
ω	0.277	0.245

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

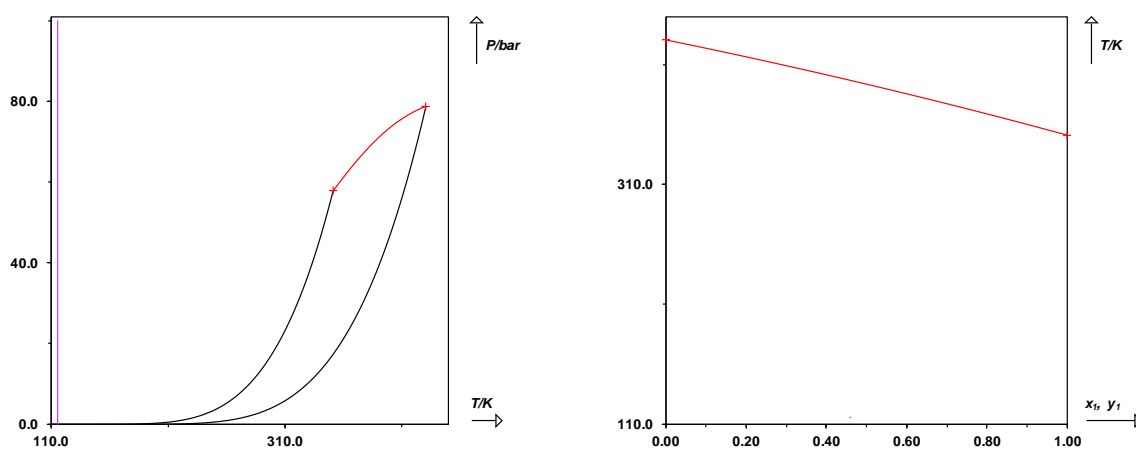
$A/\text{MPa} = 12.96$

$B/\text{MPa} = 38.77$

Deviations

MAPE on $x = 1.1\%$

MAPE on $y = 1.3\%$



Isothermal phase equilibrium data

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa, International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 288.07

P / bar	x ₁	y ₁
4.170	0.1350	0.4010
5.260	0.2330	0.5630
6.219	0.3330	0.6670
7.458	0.4560	0.7590
9.334	0.6510	0.8650
11.14	0.8370	0.9390

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa, International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 303.15

P / bar	x ₁	y ₁
5.954	0.0840	0.2680
8.039	0.2230	0.5140
10.13	0.3700	0.6660
11.99	0.5030	0.7610
13.90	0.6380	0.8390
15.74	0.7670	0.8980
17.08	0.8560	0.9360

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa, International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 323.15

P / bar	x ₁	y ₁
11.59	0.1390	0.3380
14.75	0.2780	0.5340
18.29	0.4420	0.6840
21.34	0.5840	0.7790
24.50	0.7230	0.8600
27.49	0.8480	0.9230

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa,

International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 343.15

P / bar	x ₁	y ₁
18.14	0.1230	0.2720
23.95	0.3050	0.5160
29.03	0.4660	0.6570
34.02	0.6180	0.7640
38.96	0.7590	0.8540
43.56	0.8810	0.9240

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa, International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 353.15

P / bar	x ₁	y ₁
23.06	0.1360	0.2760
27.85	0.2630	0.4490
32.96	0.4000	0.5840
39.59	0.5710	0.7170
46.16	0.7290	0.8190
53.16	0.8800	0.9140

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa, International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 363.15

P / bar	x ₁	y ₁
28.05	0.1290	0.2480
33.87	0.2620	0.4240
39.76	0.3970	0.5580
46.14	0.5370	0.6700
51.37	0.6460	0.7460
55.56	0.7270	0.7980
60.21	0.8140	0.8460

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa, International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 383.15

P / bar	x ₁	y ₁
40.08	0.1070	0.1910
44.56	0.1880	0.2980

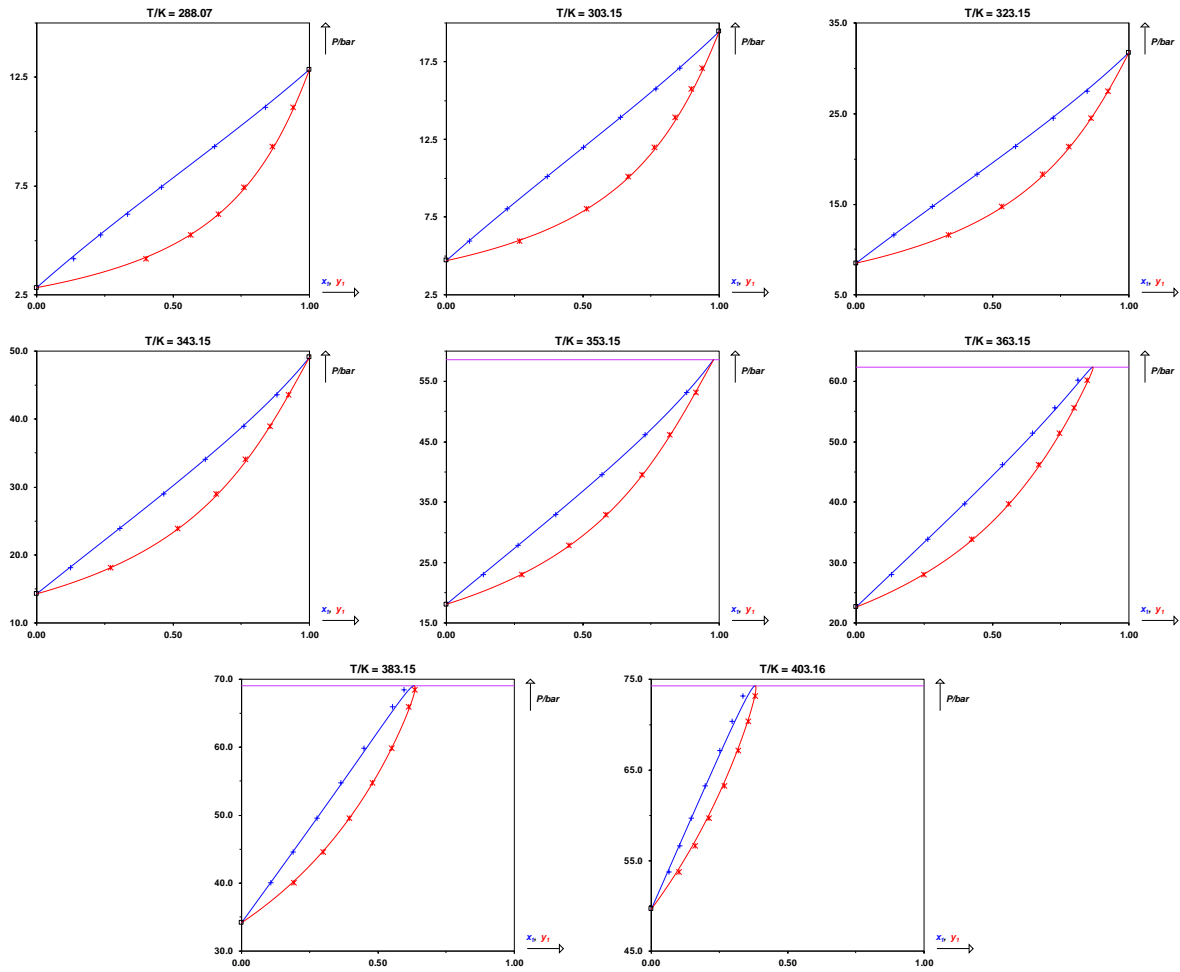
49.52	0.2750	0.3940
54.75	0.3650	0.4800
59.81	0.4500	0.5500
65.89	0.5520	0.6130
68.45	0.5960	0.6350

Valtz, A. - Coquelet, C. - Richon, D., Vapor–Liquid Equilibrium Data for the Sulfur Dioxide (SO₂) + Difluoromethane (R32) System at Temperatures from 288.07 to 403.16 K and at Pressures up to 7.31 MPa, International Journal of Thermophysics. 25 (2004) 1695-1711. doi:10.1007/s10765-004-7730-9

T / K = 403.16

P / bar	x ₁	y ₁
53.69	0.0640	0.1020
56.65	0.1050	0.1600
59.65	0.1470	0.2110
63.22	0.1960	0.2670
67.11	0.2500	0.3180
70.33	0.2960	0.3550
73.10	0.3370	0.3800

HD-HA systems (BAC = 6)



DIFLUOROMETHANE (1) + DIMETHYL ETHER (2)

CAS	75-10-5	115-10-6
InChiKey	RWRIWBAlICGTTQ-UHFFFAOYSA-N	LCGLNKUTAGEVQW-UHFFFAOYSA-N
T_c / K	351.26	400.10
P_c / bar	57.84	53.70
ω	0.277	0.200

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

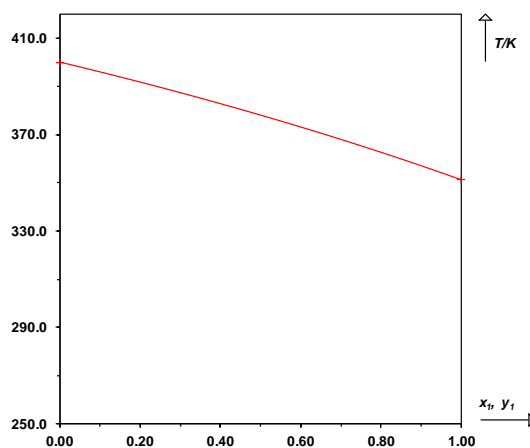
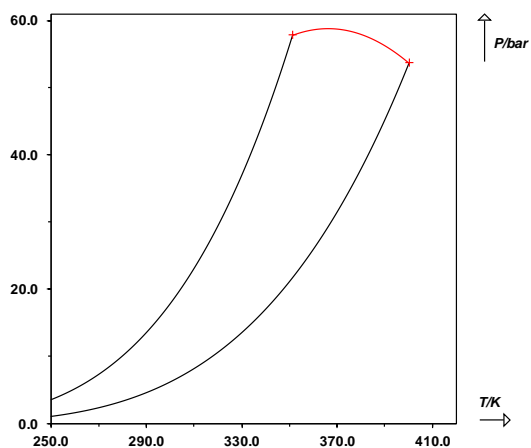
$A/\text{MPa} = -3.086$

$B/\text{MPa} = -6.540$

Deviations

MAPE on $x = 2.5\%$

MAPE on $y = 2.4\%$



Isothermal phase equilibrium data

Fedele, L. - Bobbo, S. - De Stefani, V. - Camporese, R. - Stryjek, R., Isothermal VLE Measurements for Difluoromethane + Dimethyl Ether and an Evaluation of Hydrogen Bonding, J. Chem. Eng. Data. 50 (2005) 128-132. doi:10.1021/je049789+

T / K = 258.15

P / bar	x ₁	y ₁
1.794	0.1025	0.2330
2.118	0.2160	0.4247
2.337	0.2850	0.5198
2.893	0.4423	0.6965
3.258	0.5376	0.7727
3.624	0.6386	0.8404
4.077	0.7639	0.9021
4.534	0.8983	0.9578

Fedele, L. - Bobbo, S. - De Stefani, V. - Camporese, R. - Stryjek, R., Isothermal VLE Measurements for Difluoromethane + Dimethyl Ether and an Evaluation of Hydrogen Bonding, J. Chem. Eng. Data. 50 (2005) 128-132. doi:10.1021/je049789+

T / K = 273.15

P / bar	x ₁	y ₁
2.750	0.0181	0.0444
3.268	0.1356	0.2854
3.762	0.2378	0.4471
4.772	0.4195	0.6571
5.489	0.5405	0.7606
6.245	0.6687	0.8451
7.136	0.8258	0.9254
7.733	0.9313	0.9702

Coquelet, Christophe - Valtz, Alain - Richon, Dominique, Vapor-liquid equilibrium data for the difluoromethane (R32)-dimethyl ether (RE170) system at temperatures from 283.03 to 363.21K and pressures up to 5.5MPa, Fluid Phase Equilibria. 232 (2005) 44-49. doi:10.1016/j.fluid.2005.02.013

T / K = 283.03

P / bar	x ₁	y ₁
4.998	0.1996	0.3856
5.874	0.3207	0.5513
6.794	0.4445	0.6677
7.757	0.5670	0.7688
8.959	0.7242	0.8635
9.964	0.8573	0.9324

Fedele, L. - Bobbo, S. - De Stefani, V. - Camporese, R. - Stryjek, R., Isothermal VLE Measurements for

Difluoromethane + Dimethyl Ether and an Evaluation of Hydrogen Bonding, J. Chem. Eng. Data. 50 (2005) 128-132. doi:10.1021/je049789+

T / K = 293.15

P / bar	x ₁	y ₁
5.732	0.0836	0.1749
6.547	0.1831	0.3460
7.823	0.3215	0.5310
8.988	0.4400	0.6534
10.30	0.5675	0.7580
11.72	0.7048	0.8479
12.78	0.8069	0.9046
14.16	0.9441	0.9727

Coquelet, Christophe - Valtz, Alain - Richon, Dominique, Vapor-liquid equilibrium data for the difluoromethane (R32)-dimethyl ether (RE170) system at temperatures from 283.03 to 363.21K and pressures up to 5.5MPa, Fluid Phase Equilibria. 232 (2005) 44-49. doi:10.1016/j.fluid.2005.02.013

T / K = 298.11

P / bar	x ₁	y ₁
7.151	0.1357	0.2667
8.674	0.2790	0.4806
10.80	0.4702	0.6785
12.34	0.6069	0.7801
13.96	0.7509	0.8653
15.30	0.8665	0.9298

Im, Jihoon - Lee, Gangwon - Kim, Hwayong, Vapor-Liquid Equilibria of the Difluoromethane + Dimethyl Ether and 1,1,1,2-Tetrafluoroethane + Dimethyl Ether Systems, Journal of Chemical & Engineering Data. 51 (2006) 1126-1129. doi:10.1021/je060028b

T / K = 313.15

P / bar	x ₁	y ₁
10.40	0.1186	0.2145
11.36	0.1881	0.3256
12.34	0.2555	0.4187
14.73	0.4108	0.5893
15.87	0.4815	0.6561
16.82	0.5381	0.6966
18.50	0.6370	0.7687
19.17	0.6811	0.8036
21.15	0.7964	0.8828
22.00	0.8454	0.9119
22.86	0.8936	0.9395

Im, Jihoon - Lee, Gangwon - Kim, Hwayong, Vapor-Liquid Equilibria of the Difluoromethane + Dimethyl Ether and 1,1,1,2-Tetrafluoroethane + Dimethyl Ether Systems,

HD-HA systems (BAC = 6)

Journal of Chemical & Engineering Data. 51 (2006) 1126-1129. doi:10.1021/je060028b

T / K = 323.15

P / bar	x_1	y_1
12.28	0.0510	0.0849
13.23	0.1106	0.1864
14.24	0.1693	0.2850
15.26	0.2265	0.3671
16.65	0.3012	0.4624
17.83	0.3662	0.5371
20.16	0.4832	0.6476
21.46	0.5459	0.7017
23.00	0.6200	0.7569
24.35	0.6838	0.8018
25.40	0.7353	0.8367
27.32	0.8239	0.8923
28.87	0.8903	0.9326
30.28	0.9516	0.9701

Coquelet, Christophe - Valtz, Alain - Richon, Dominique, Vapor-liquid equilibrium data for the difluoromethane (R32)-dimethyl ether (RE170) system at temperatures from 283.03 to 363.21K and pressures up to 5.5MPa, Fluid Phase Equilibria. 232 (2005) 44-49. doi:10.1016/j.fluid.2005.02.013

T / K = 328.16

P / bar	x_1	y_1
15.21	0.1253	0.2262
18.23	0.2750	0.4327
21.09	0.4077	0.5792
23.88	0.5338	0.6901
26.66	0.6556	0.7807
29.48	0.7743	0.8572
32.09	0.8786	0.9249

Im, Jihoon - Lee, Gangwon - Kim, Hwayong, Vapor-Liquid Equilibria of the Difluoromethane + Dimethyl Ether and 1,1,1,2-Tetrafluoroethane + Dimethyl Ether Systems, Journal of Chemical & Engineering Data. 51 (2006) 1126-1129. doi:10.1021/je060028b

T / K = 333.15

P / bar	x_1	y_1
15.41	0.0475	0.0879
16.75	0.1139	0.1954
18.57	0.2013	0.3264
20.85	0.3037	0.4549
25.81	0.5100	0.6559
26.72	0.5434	0.6851
28.78	0.6243	0.7480
29.54	0.6546	0.7703
30.88	0.7018	0.8028

33.41	0.7984	0.8668
35.63	0.8767	0.9175
37.74	0.9501	0.9659

Im, Jihoon - Lee, Gangwon - Kim, Hwayong, Vapor-Liquid Equilibria of the Difluoromethane + Dimethyl Ether and 1,1,1,2-Tetrafluoroethane + Dimethyl Ether Systems, Journal of Chemical & Engineering Data. 51 (2006) 1126-1129. doi:10.1021/je060028b

T / K = 343.15

P / bar	x_1	y_1
20.78	0.1120	0.1930
22.39	0.1765	0.2877
23.97	0.2362	0.3654
26.65	0.3339	0.4774
29.38	0.4281	0.5686
31.24	0.4919	0.6251
32.19	0.5230	0.6519
34.23	0.5870	0.7028
35.29	0.6235	0.7310
39.36	0.7470	0.8193
42.11	0.8250	0.8738
44.12	0.8777	0.9096
45.60	0.9175	0.9377
46.86	0.9548	0.9641

Coquelet, Christophe - Valtz, Alain - Richon, Dominique, Vapor-liquid equilibrium data for the difluoromethane (R32)-dimethyl ether (RE170) system at temperatures from 283.03 to 363.21K and pressures up to 5.5MPa, Fluid Phase Equilibria. 232 (2005) 44-49. doi:10.1016/j.fluid.2005.02.013

T / K = 353.16

P / bar	x_1	y_1
25.48	0.1057	0.1741
30.06	0.2494	0.3688
35.06	0.3968	0.5251
40.00	0.5349	0.6453
44.46	0.6527	0.7348
48.70	0.7569	0.8104
51.97	0.8333	0.8641
52.77	0.8525	0.8772

Coquelet, Christophe - Valtz, Alain - Richon, Dominique, Vapor-liquid equilibrium data for the difluoromethane (R32)-dimethyl ether (RE170) system at temperatures from 283.03 to 363.21K and pressures up to 5.5MPa, Fluid Phase Equilibria. 232 (2005) 44-49. doi:10.1016/j.fluid.2005.02.013

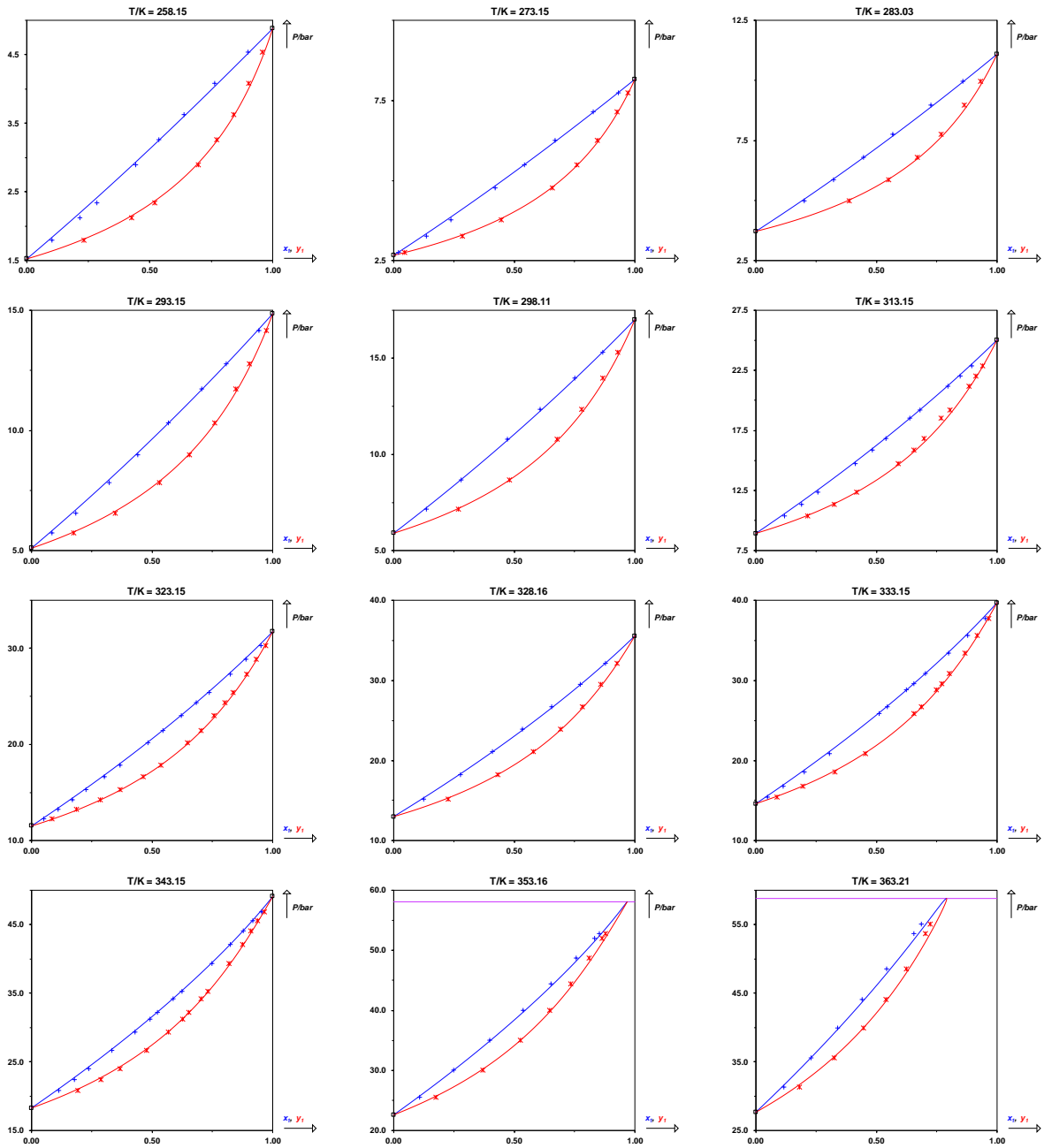
T / K = 363.21

P / bar	x_1	y_1
31.33	0.1163	0.1802

HD-HA systems (BAC = 6)

35.55	0.2295	0.3253
39.89	0.3381	0.4450
44.09	0.4406	0.5400
48.50	0.5430	0.6224
53.65	0.6553	0.7022
55.06	0.6859	0.7217

HD-HA systems (BAC = 6)



TRIFLUOROMETHANE (1) + CARBON DISULFIDE (2)

CAS	75-46-7	75-15-0
InChiKey	XPDWGBQVDMORPB-UHFFFAOYSA-N	QGJOPFRUJISHPQ-UHFFFAOYSA-N
T_c / K	299.01	552.00
P_c / bar	48.16	79.00
ω	0.264	0.111

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

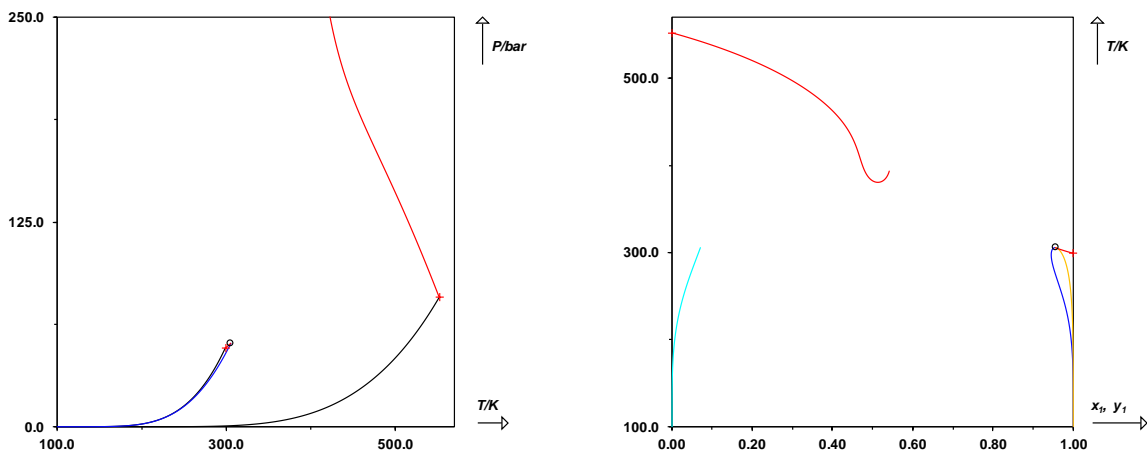
$A/\text{MPa} = 285.7$

$B/\text{MPa} = 414.3$

Deviations

MAPE on $x = 9.1\%$

MAPE on $y = 6.0\%$



Isothermal phase equilibrium data

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 273.15

P / bar	x ₁	y ₁
3.550	0.0057	0.9443
6.340	0.0090	0.9674
9.940	0.0172	0.9777
13.12	0.0215	0.9823
17.11	0.0268	0.9838
19.78	0.0288	0.9849
21.94	0.0342	0.9844
22.98	0.0353	0.9849
24.09	0.9628	0.9880

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 298.15

P / bar	x ₁	y ₁
4.100	0.0057	0.8756
9.100	0.0115	0.9356
13.95	0.0180	0.9535
19.78	0.0254	0.9628
25.07	0.0321	0.9685
29.91	0.0375	0.9680
34.81	0.0431	0.9700
40.09	0.0520	0.9704
45.14	0.9699	0.9814

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 303.15

P / bar	x ₁	y ₁
5.070	0.0094	0.8743
20.08	0.0263	0.9591
35.10	0.0431	0.9681
44.74	0.0566	0.9679
49.27	0.0565	0.9605
53.34	0.0595	0.9354
62.38	0.0577	0.9424
99.14	0.0600	0.9265

144.70	0.0595	0.9259
185.60	0.0592	0.9272
205.40	0.0593	0.9273

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 323.15

P / bar	x ₁	y ₁
8.200	0.0102	0.8458
25.10	0.0313	0.9354
45.90	0.0537	0.9496
75.20	0.0756	0.9227
91.60	0.0802	0.9089
109.10	0.0821	0.9012
125.30	0.0824	0.8964
150.10	0.0868	0.8973
173.10	0.0855	0.8942
197.80	0.0867	0.8941

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 348.15

P / bar	x ₁	y ₁
10.10	0.0105	0.7401
20.70	0.0213	0.8560
40.30	0.0490	0.9061
70.20	0.0829	0.9149
100.10	0.1052	0.8878
129.60	0.1168	0.8604
160.00	0.1246	0.8436
199.60	0.1315	0.8358
249.20	0.1370	0.8288
297.40	0.1430	0.8250

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 373.15

P / bar	x ₁	y ₁
9.700	0.0065	0.5056
22.70	0.0206	0.7590
48.40	0.0527	0.8522
73.80	0.0879	0.8701
99.90	0.1189	0.8639

HD-HA systems (BAC = 6)

110.70	0.1315	0.8500	65.00	0.0683	0.5767
140.50	0.1581	0.8128	85.70	0.0984	0.6171
157.50	0.1715	0.7948	105.50	0.1352	0.6400
193.50	0.1918	0.7623	125.40	0.1807	0.6260
225.90	0.2073	0.7392	140.40	0.2218	0.5910

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 398.15

P / bar	x ₁	y ₁
15.20	0.0089	0.4510
30.00	0.0307	0.6911
50.40	0.0547	0.7783
80.10	0.0979	0.8215
109.40	0.1405	0.8112
140.70	0.1907	0.7742
170.00	0.2394	0.7037
199.70	0.3003	0.6372
209.90	0.3265	0.5982
221.10	0.3806	0.5420
223.70	0.4037	0.5030

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 423.15

P / bar	x ₁	y ₁
20.40	0.0102	0.3320
30.60	0.0250	0.5247
50.50	0.0497	0.6562
80.00	0.0942	0.7223
110.50	0.1480	0.7314
140.10	0.2086	0.7005
168.00	0.2941	0.6170
173.90	0.3224	0.5840
180.60	0.3861	0.5174

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 448.15

P / bar	x ₁	y ₁
22.70	0.0055	0.1403
30.50	0.0171	0.3148
45.10	0.0357	0.4728

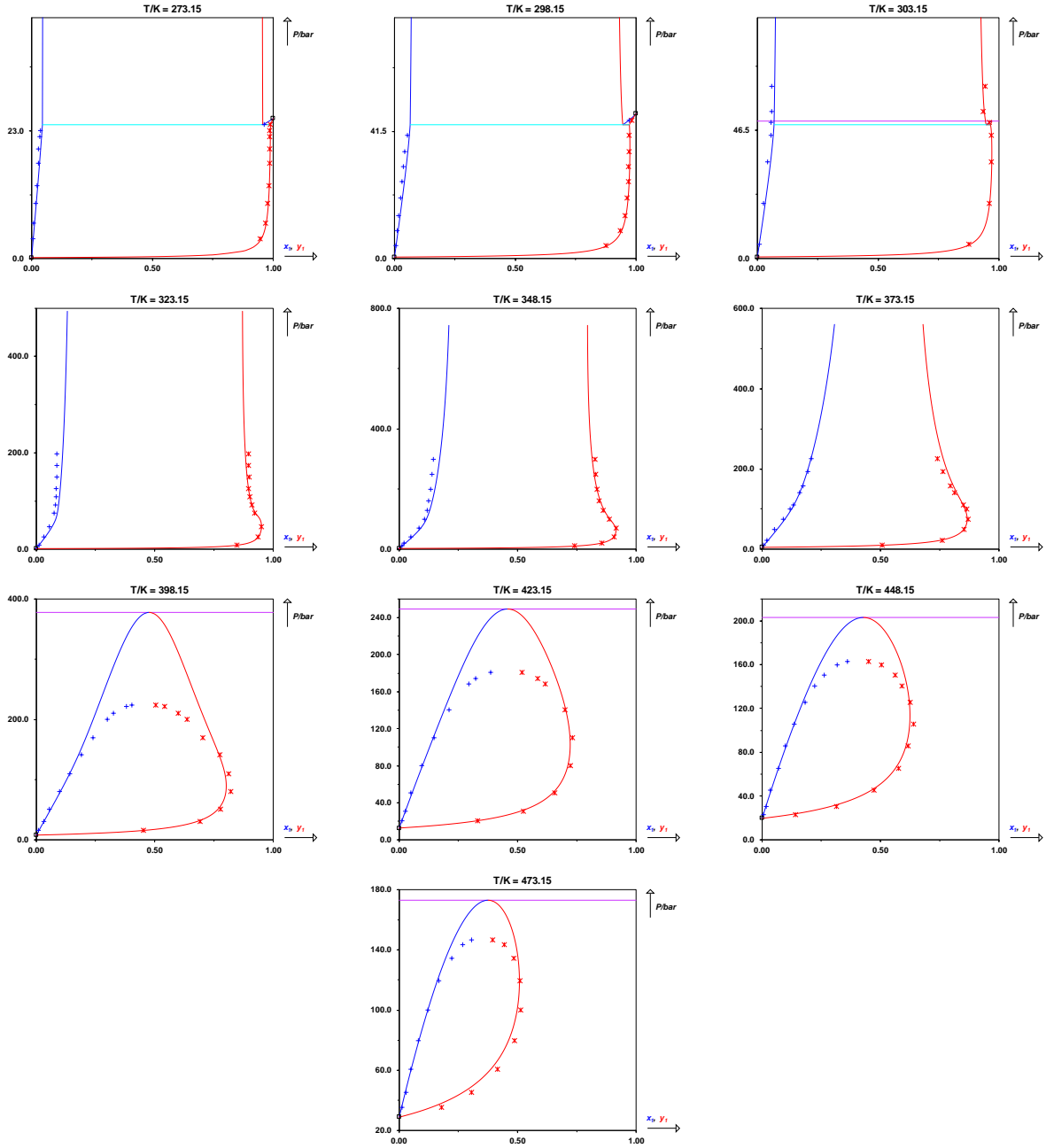
160.00	0.3178	0.5044
163.10	0.3590	0.4503

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 473.15

P / bar	x ₁	y ₁
35.50	0.0112	0.1779
45.20	0.0272	0.3052
60.50	0.0490	0.4145
79.80	0.0805	0.4856
100.10	0.1202	0.5128
119.40	0.1681	0.5094
134.60	0.2203	0.4844
143.60	0.2672	0.4426
146.60	0.3043	0.3957

HD-HA systems (BAC = 6)



1,1,1-TRIFLUOROETHANE (1) + DIMETHYL ETHER (2)

CAS	420-46-2	115-10-6
InChiKey	UJPMYEOUBPIPHQ-UHFFFAOYSA-N	LCGLNKUTAGEVQW-UHFFFAOYSA-N
T_c / K	345.88	400.10
P_c / bar	37.64	53.70
ω	0.261	0.200

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

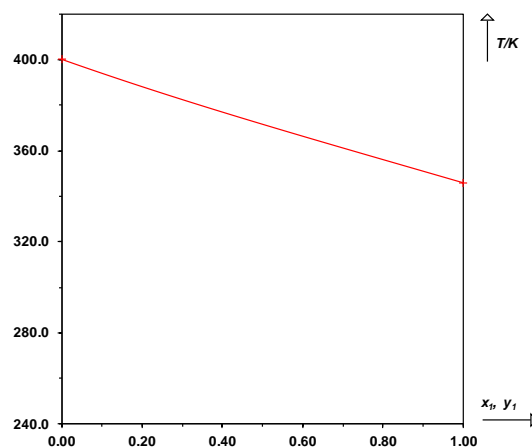
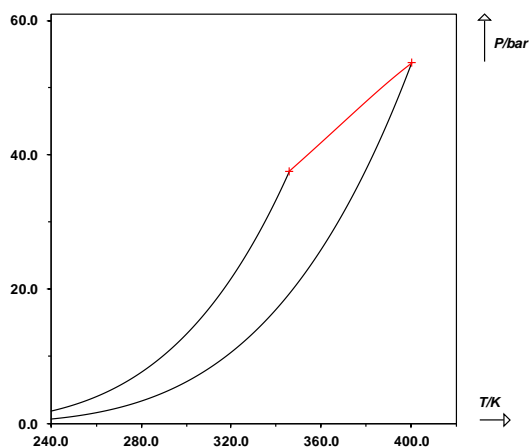
$A/\text{MPa} = 5.098$

$B/\text{MPa} = -17.67$

Deviations

MAPE on $x = 3.0\%$

MAPE on $y = 3.4\%$



Isothermal phase equilibrium data

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, Vapor-liquid equilibria of the 1,1,1-trifluoroethane (HFC-143a)+dimethyl ether (DME) system, Fluid Phase Equilibria. 251 (2007) 59-62.

doi:10.1016/j.fluid.2006.10.017

T / K = 313.15

P / bar	x ₁	y ₁
9.010	0.0147	0.0226
9.270	0.0391	0.0618
9.840	0.0983	0.1529
10.32	0.1481	0.2236
10.90	0.2088	0.3010
11.71	0.2922	0.4012
12.53	0.3813	0.5035
13.57	0.4907	0.6043
14.57	0.5994	0.6982
15.59	0.7123	0.7898
16.72	0.8320	0.8781
17.74	0.9394	0.9581

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, Vapor-liquid equilibria of the 1,1,1-trifluoroethane (HFC-143a)+dimethyl ether (DME) system, Fluid Phase Equilibria. 251 (2007) 59-62.

doi:10.1016/j.fluid.2006.10.017

T / K = 323.15

P / bar	x ₁	y ₁
11.98	0.0453	0.0781
12.67	0.1028	0.1678
14.46	0.2531	0.3641
15.37	0.3348	0.4543
17.29	0.4972	0.6121
18.56	0.6163	0.7088
20.11	0.7491	0.8136
22.44	0.9496	0.9618

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, Vapor-liquid equilibria of the 1,1,1-trifluoroethane (HFC-143a)+dimethyl ether (DME) system, Fluid Phase Equilibria. 251 (2007) 59-62.

doi:10.1016/j.fluid.2006.10.017

T / K = 333.15

P / bar	x ₁	y ₁
14.97	0.0311	0.0525
15.48	0.0659	0.1081
16.30	0.1210	0.1881
17.32	0.1917	0.2826
19.08	0.3174	0.4243
20.73	0.4362	0.5409

22.58	0.5678	0.6586
24.76	0.7260	0.7845
26.61	0.8552	0.8855

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, Vapor-liquid equilibria of the 1,1,1-trifluoroethane (HFC-143a)+dimethyl ether (DME) system, Fluid Phase Equilibria. 251 (2007) 59-62.

doi:10.1016/j.fluid.2006.10.017

T / K = 343.15

P / bar	x ₁	y ₁
19.03	0.0524	0.0834
20.25	0.1203	0.1826
21.33	0.1826	0.2623
22.50	0.2510	0.3415
23.88	0.3336	0.4297
25.69	0.4424	0.5333
27.59	0.5532	0.6327
30.12	0.6981	0.7539
32.54	0.8392	0.8645

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, Vapor-liquid equilibria of the 1,1,1-trifluoroethane (HFC-143a)+dimethyl ether (DME) system, Fluid Phase Equilibria. 251 (2007) 59-62.

doi:10.1016/j.fluid.2006.10.017

T / K = 353.15

P / bar	x ₁	y ₁
23.61	0.0555	0.0860
24.73	0.1104	0.1614
26.30	0.1841	0.2559
28.26	0.2805	0.3622
30.71	0.4070	0.4848
33.40	0.5387	0.6028
35.30	0.6295	0.6779
37.53	0.7334	0.7625
39.01	0.8028	0.8161

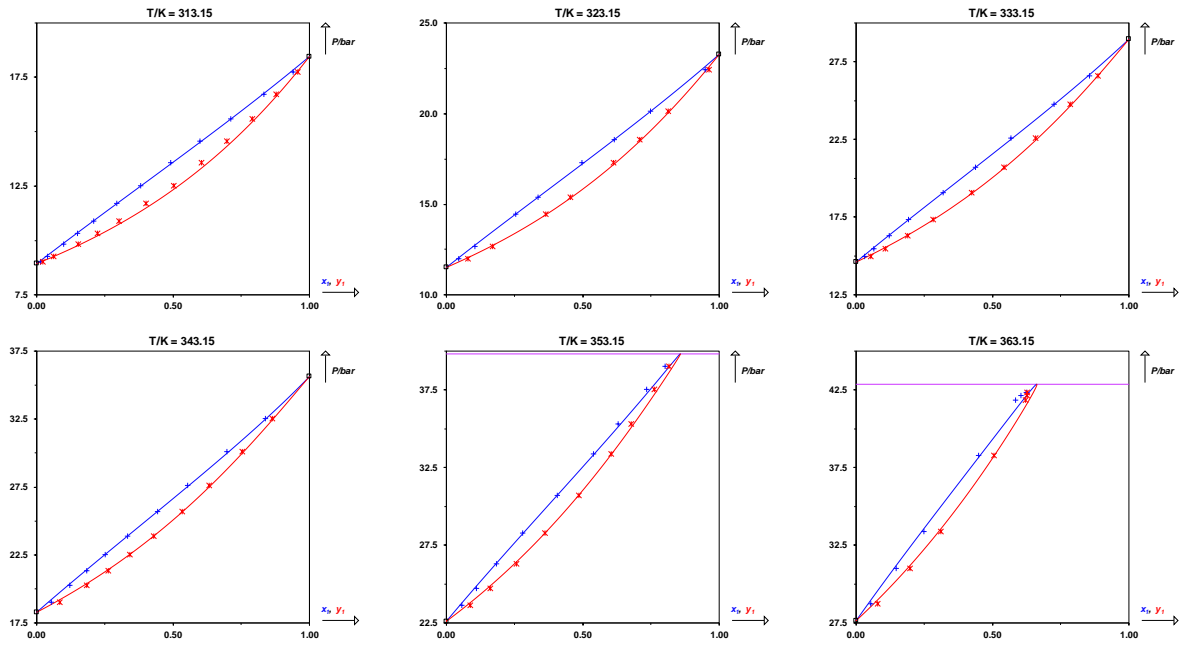
Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, Vapor-liquid equilibria of the 1,1,1-trifluoroethane (HFC-143a)+dimethyl ether (DME) system, Fluid Phase Equilibria. 251 (2007) 59-62.

doi:10.1016/j.fluid.2006.10.017

T / K = 363.15

P / bar	x ₁	y ₁
28.71	0.0530	0.0781
31.02	0.1456	0.1986
33.39	0.2470	0.3108
38.30	0.4486	0.5059
41.83	0.5828	0.6199
42.16	0.6052	0.6262
42.33	0.6238	0.6277

HD-HA systems (BAC = 6)



DICHLOROMETHANE (1) + CARBON DISULFIDE (2)

CAS	75-09-2	75-15-0
InChiKey	YMWUJEATGCHHMB-UHFFFAOYSA-N	QGJOPFRUJISHPQ-UHFFFAOYSA-N
T_c / K	510.00	552.00
P_c / bar	60.80	79.00
ω	0.199	0.111

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 79.26$

$B/\text{MPa} = 140.2$

Deviations

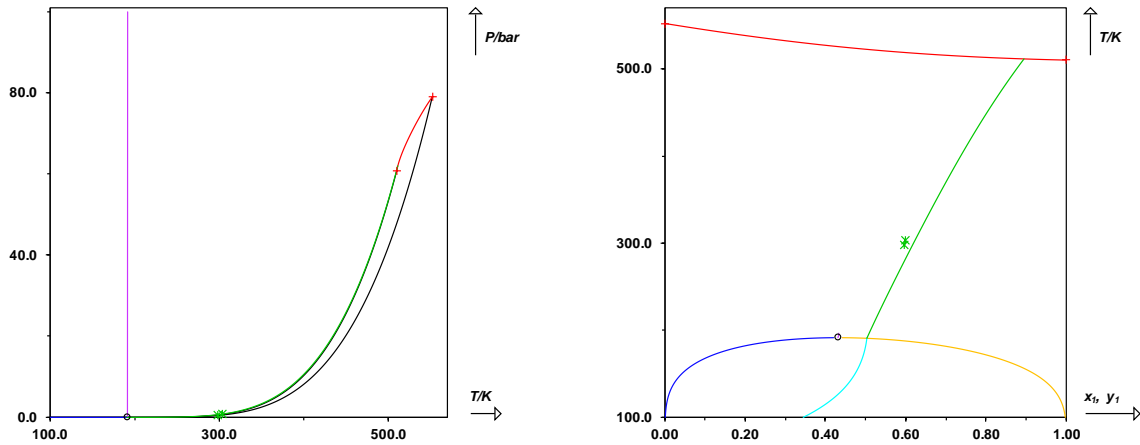
MAPE on $x = 5.8\%$

MAPE on $y = 5.1\%$

MAPE on $x_{az} = 4.8\%$

MAPE on $P_{az} = 0.09\%$

MAPE on $h^M = 7.8\%$



Isothermal phase equilibrium data

Mozzhukhin, A.S. - Serafimov, I.A. - Zetkin, V.I. - Raskina, A.D. - Mitropol'skaya, V.A., Liquid-vapor equilibrium in a sulfur monochloride-perchloromethyl mercaptan system at low pressures, J. Appl. Chem. USSR. 41 (1968) 2764-2766.

T / K =	298.15		
P / bar	x ₁	y ₁	
0.6102	0.2171	0.3306	
0.6332	0.3102	0.4081	
0.6420	0.3606	0.4457	
0.6428	0.3642	0.4483	
0.6531	0.4500	0.5051	
0.6570	0.4992	0.5352	
0.6582	0.5205	0.5481	
0.6590	0.5430	0.5617	
0.6598	0.5897	0.5908	
0.6600	0.5952	0.5952	AZEO
0.6600	0.5982	0.5962	
0.6587	0.6487	0.6302	
0.6556	0.7010	0.6688	
0.6507	0.7548	0.7126	
0.6439	0.8055	0.7577	
0.6301	0.8761	0.8266	
0.6257	0.8935	0.8451	

Mozzhukhin, A.S. - Serafimov, I.A. - Zetkin, V.I. - Raskina, A.D. - Mitropol'skaya, V.A., Liquid-vapor equilibrium in a sulfur monochloride-perchloromethyl mercaptan system at low pressures, J. Appl. Chem. USSR. 41 (1968) 2764-2766.

T / K =	303.15		
P / bar	x ₁	y ₁	
0.7339	0.2170	0.3570	
0.7636	0.3100	0.4268	
0.7733	0.3584	0.4558	
0.7746	0.3641	0.4591	
0.7860	0.4498	0.5067	
0.7903	0.4992	0.5350	
0.7916	0.5201	0.5475	
0.7926	0.5430	0.5617	
0.7937	0.5897	0.5923	
0.7938	0.5986	0.5986	AZEO
0.7938	0.5992	0.5988	
0.7929	0.6485	0.6343	
0.7899	0.7006	0.6745	
0.7848	0.7512	0.7161	
0.7773	0.8055	0.7633	
0.7625	0.8761	0.8299	

0.7578 0.8935 0.8480

Mozzhukhin, A.S. - Serafimov, I.A. - Zetkin, V.I. - Raskina, A.D. - Mitropol'skaya, V.A., Liquid-vapor equilibrium in a sulfur monochloride-perchloromethyl mercaptan system at low pressures, J. Appl. Chem. USSR. 41 (1968) 2764-2766.

T / K =	308.15	
P / bar	x ₁	y ₁
0.8742	0.2170	0.3526
0.9104	0.3098	0.4255
0.9247	0.3639	0.4603
0.9400	0.4498	0.5116
0.9462	0.4991	0.5411
0.9479	0.5195	0.5536
0.9497	0.5429	0.5683
0.9520	0.5896	0.5986
0.9521	0.5987	0.6048
0.9520	0.6481	0.6391
0.9492	0.7005	0.6780
0.9434	0.7545	0.7207
0.9351	0.8054	0.7638
0.9173	0.8761	0.8306
0.9116	0.8935	0.8490

Enthalpy of mixing

Siddiqi, M.A. - Lucas, K., The excess enthalpy of methyl iodide + carbon disulphide, methyl iodide + dichloromethane and dichloromethane + carbon disulphide over a range of temperatures and pressures, Fluid Phase Equilibria. 20 (1985) 297-304. doi:10.1016/0378-3812(85)90048-2

T / K =	283.15	
P / bar =	1.0000	
h ^M / J.mol ⁻¹	z ₁	
748.70	0.1930	
954.20	0.2900	
1074.5	0.3820	
1106.3	0.4830	
1053.3	0.5850	
973.90	0.6570	
815.80	0.7420	
611.40	0.8280	

Siddiqi, M.A. - Lucas, K., The excess enthalpy of methyl iodide + carbon disulphide, methyl iodide + dichloromethane and dichloromethane + carbon disulphide over a range of temperatures and pressures, Fluid Phase Equilibria. 20 (1985) 297-304. doi:10.1016/0378-3812(85)90048-2

T / K =	293.15
P / bar =	1.0000
$h^M / \text{J.mol}^{-1}$	z_1
602.70	0.1560
802.00	0.2370
953.60	0.3200
1038.6	0.4020
1063.8	0.4870
1013.6	0.5710
916.50	0.6570
766.20	0.7420
568.60	0.8260

Siddiqi, M.A. - Lucas, K., The excess enthalpy of methyl iodide + carbon disulphide, methyl iodide + dichloromethane and dichloromethane + carbon disulphide over a range of temperatures and pressures, Fluid Phase Equilibria. 20 (1985) 297-304. doi:10.1016/0378-3812(85)90048-2

T / K =	293.15
P / bar =	150.00
$h^M / \text{J.mol}^{-1}$	z_1
662.10	0.1470
715.60	0.1640
1018.0	0.3030
1116.5	0.4050
1130.3	0.4850
1091.2	0.5880
1001.8	0.6650
906.60	0.7290
662.20	0.8340

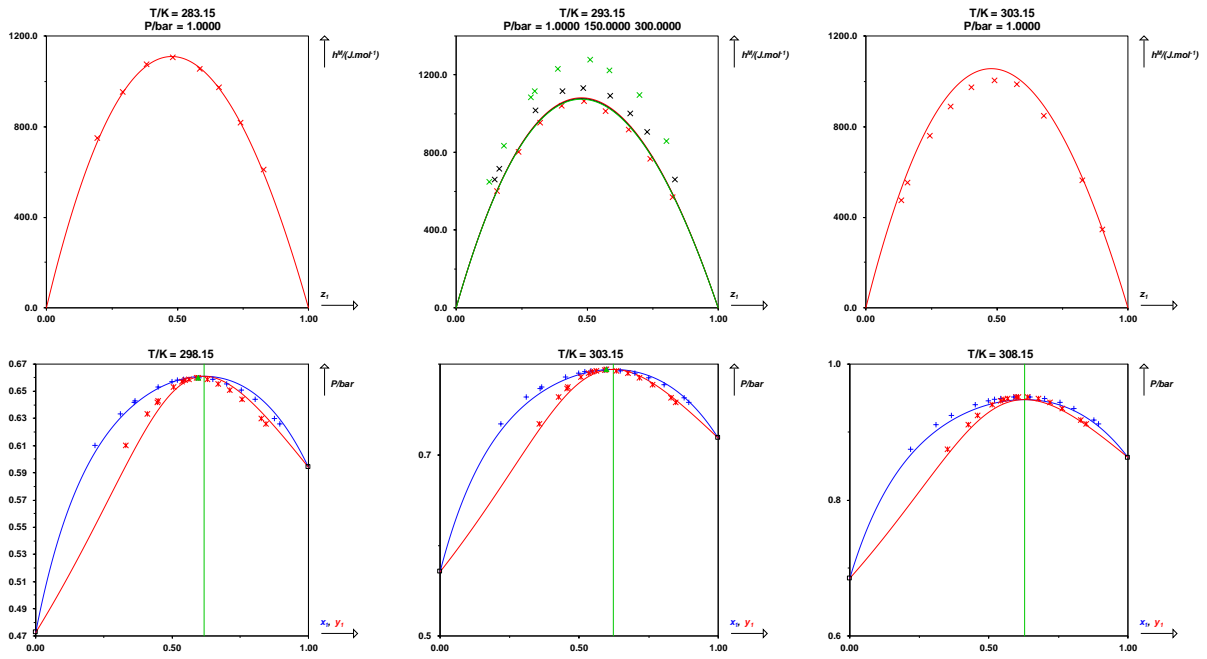
Siddiqi, M.A. - Lucas, K., The excess enthalpy of methyl iodide + carbon disulphide, methyl iodide + dichloromethane and dichloromethane + carbon disulphide over a range of temperatures and pressures, Fluid Phase Equilibria. 20 (1985) 297-304. doi:10.1016/0378-3812(85)90048-2

T / K =	293.15
P / bar =	300.00
$h^M / \text{J.mol}^{-1}$	z_1
647.80	0.1270
834.80	0.1830
1085.2	0.2850
1116.4	0.2990
1230.0	0.3890
1277.2	0.5100
1222.0	0.5860
1095.7	0.6990
859.90	0.8030

Siddiqi, M.A. - Lucas, K., The excess enthalpy of methyl iodide + carbon disulphide, methyl iodide + dichloromethane and dichloromethane + carbon disulphide over a range of temperatures and pressures, Fluid Phase Equilibria. 20 (1985) 297-304. doi:10.1016/0378-3812(85)90048-2

T / K =	303.15
P / bar =	1.0000
$h^M / \text{J.mol}^{-1}$	z_1
476.00	0.1360
553.40	0.1590
760.10	0.2440
887.60	0.3220
974.00	0.4030
1003.8	0.4900
986.90	0.5750
847.40	0.6800
563.20	0.8260
345.30	0.9030

HD-HA systems (BAC = 6)



CARBON DIOXIDE (1) + CHLORODIFLUOROMETHANE (2)

CAS	124-38-9	75-45-6
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	VOPWNXZWBVDODV-UHFFFAOYSA-N
T_c / K	304.21	369.30
P_c / bar	73.83	49.71
ω	0.224	0.219

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 4.851$

$B/\text{MPa} = -26.69$

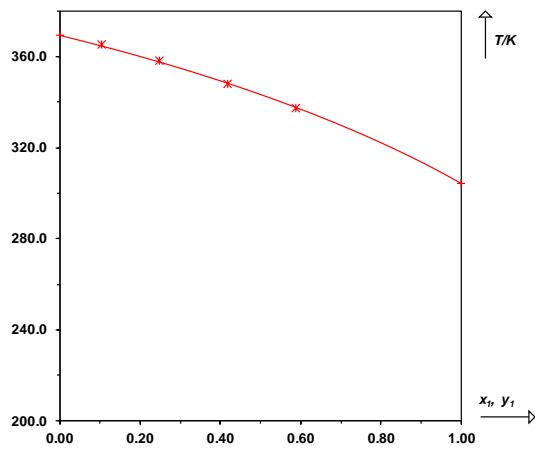
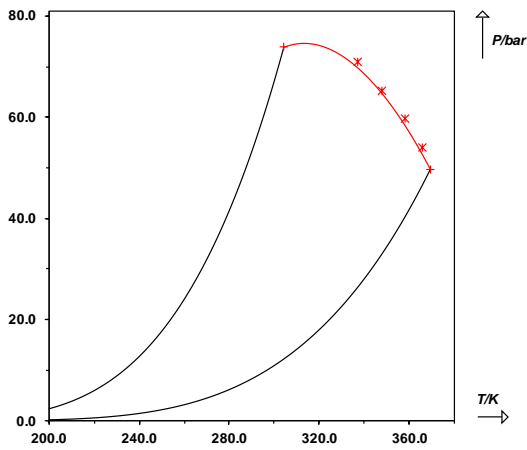
Deviations

MAPE on $x = 2.2\%$

MAPE on $y = 1.5\%$

MAPE on $x_c = 4.2\%$

MAPE on $P_c = 1.8\%$



Isothermal phase equilibrium data

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 263.20

P / bar	x ₁	y ₁
5.160	0.0870	0.3670
7.070	0.1900	0.5710
8.800	0.2810	0.6830
9.900	0.3410	0.7330
11.08	0.3890	0.7760
13.08	0.4700	0.8310
15.14	0.5640	0.8740
16.81	0.6310	0.9010
18.94	0.7200	0.9280
20.67	0.7890	0.9490
22.87	0.8760	0.9700
24.14	0.9210	0.9820

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 268.20

P / bar	x ₁	y ₁
5.570	0.0730	0.2930
6.290	0.1120	0.3820
7.410	0.1630	0.4940
8.970	0.2280	0.6070
9.530	0.2560	0.6370
10.88	0.3160	0.7000
13.20	0.4080	0.7760
15.26	0.4820	0.8270
16.97	0.5490	0.8600
18.92	0.6150	0.8900
19.88	0.6580	0.9010
21.04	0.6970	0.9160
22.71	0.7460	0.9350
24.78	0.8180	0.9540
26.70	0.8780	0.9710
27.87	0.9170	0.9810

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon

dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 273.20

P / bar	x ₁	y ₁
6.050	0.0470	0.2140
7.040	0.0960	0.3430
9.040	0.1780	0.5170
9.380	0.1950	0.5440
11.13	0.2640	0.6330
13.01	0.3410	0.7060
14.27	0.3780	0.7450
15.97	0.4420	0.7880
17.38	0.4920	0.8170
20.98	0.6160	0.8760
24.93	0.7350	0.9220
25.88	0.7610	0.9300
27.96	0.8190	0.9490
30.50	0.8950	0.9700
30.83	0.9030	0.9720

Wang, Xiaoqing - Wang, Yanru - Shi, Jun - Lu, Benjamin C. Y., Isothermal vapor-liquid equilibria at elevated pressures for the systems containing nitrogen, carbon dioxide, and chlorodifluoromethane, Journal of Chemical & Engineering Data. 36 (1991) 436-439. doi:10.1021/je00004a027

T / K = 288.20

P / bar	x ₁	y ₁
8.940	0.0340	0.1390
10.35	0.0830	0.2780
12.18	0.1420	0.4060
14.08	0.1990	0.5040
14.38	0.2060	0.5160
17.51	0.2960	0.6270
23.19	0.4370	0.7540
27.09	0.5380	0.8150
28.84	0.5720	0.8360
34.77	0.7020	0.8930
40.62	0.8260	0.9370
46.54	0.9330	0.9750

Nohka, Junichi - Sarashina, Eiji - Arai, Yasuhiko - Saito, Shozaburo, Correlation Of Vapor-Liquid Equilibria For Systems Containing A Polar Component By The Bwr Equation, Journal of Chemical Engineering of Japan. 6 (1973) 10-17. doi:10.1252/jcej.6.10

T / K = 323.15

P / bar	x ₁	y ₁
28.07	0.1420	0.3180
39.31	0.3170	0.5370
51.68	0.4820	0.6720

57.55	0.5600	0.7260
63.84	0.6430	0.7640
67.38	0.6860	0.7850
70.93	0.7260	0.7980
73.26	0.7490	0.8050

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 328.15

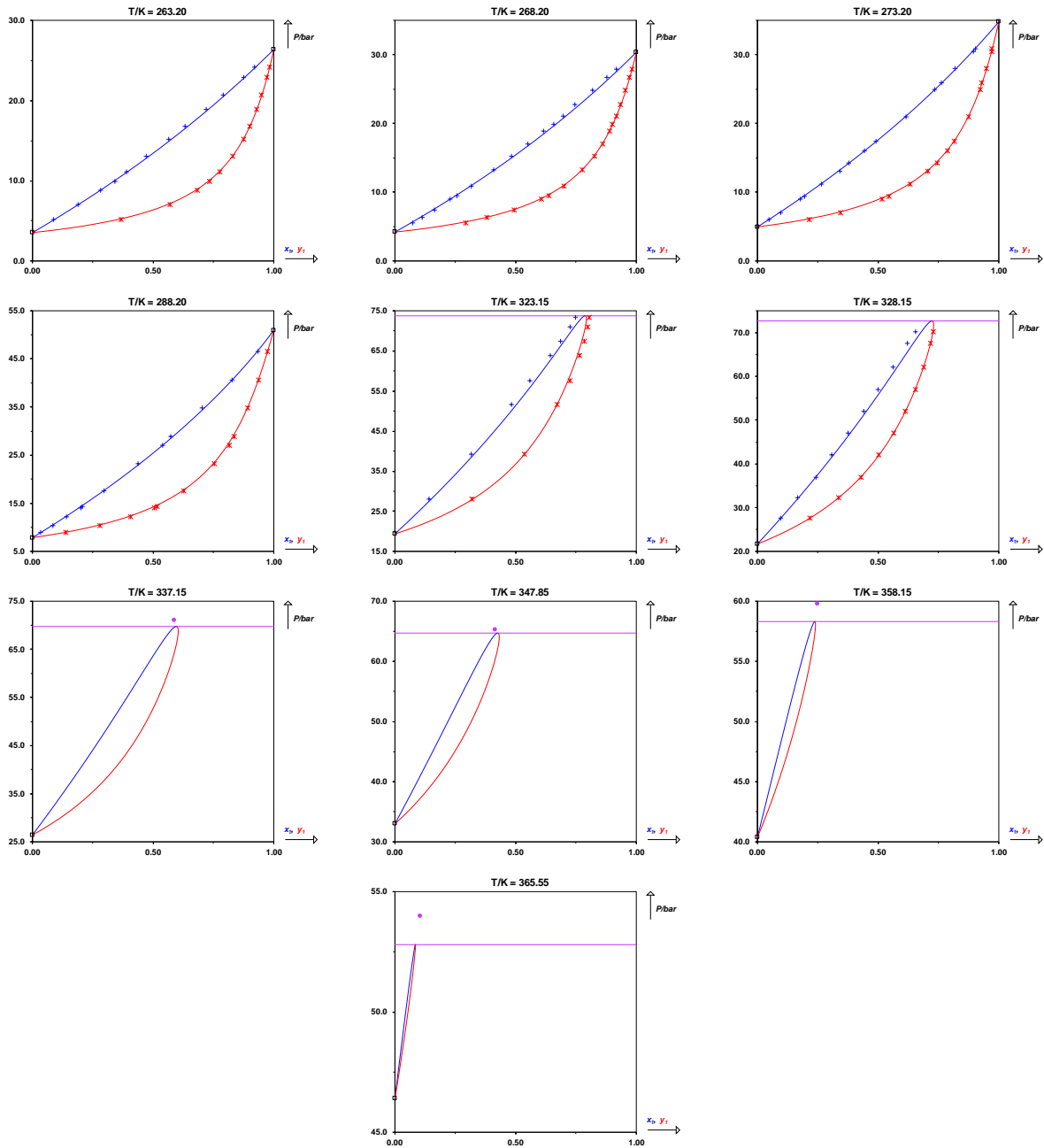
P / bar	x ₁	y ₁
27.62	0.0964	0.2160
32.32	0.1676	0.3357
36.99	0.2423	0.4288
41.99	0.3069	0.5027
46.97	0.3745	0.5632
52.03	0.4390	0.6134
57.00	0.5003	0.6538
62.06	0.5610	0.6894
67.49	0.6218	0.7171
70.15	0.6538	0.7280

Critical point

Lee, Jae Min - Lee, Byung-Chul - Cho, Chan-Hwi, Measurement of bubble point pressures and critical points of carbon dioxide and chlorodifluoromethane mixtures using the variable-volume view cell apparatus, Korean Journal of Chemical Engineering. 17 (2000) 510-515. doi:10.1007/BF02707158

T / K	P / bar	x ₁
337.15	71.00	0.5866
347.85	65.30	0.4160
358.15	59.80	0.2476
365.55	54.00	0.1036

HD-HA systems (BAC = 6)



CHLORODIFLUOROMETHANE (1) + CARBON DISULFIDE (2)

CAS	75-45-6	75-15-0
InChiKey	VOPWNXZWBVDODV-UHFFFAOYSA-N	QGJOPFRUJISHPQ-UHFFFAOYSA-N
T_c / K	369.30	552.00
P_c / bar	49.71	79.00
ω	0.219	0.111

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

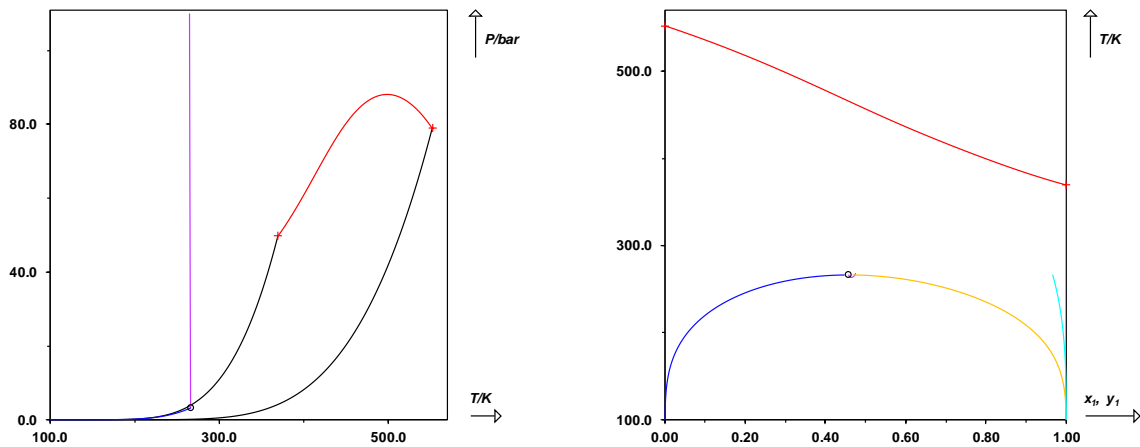
$A/\text{MPa} = 152.0$

$B/\text{MPa} = 225.6$

Deviations

MAPE on $x = 4.4\%$

MAPE on $y = 4.3\%$



Isothermal phase equilibrium data

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 273.15

P / bar	x ₁	y ₁
2.010	0.0682	0.9117
3.070	0.1503	0.9431
3.700	0.2841	0.9531
3.830	0.3541	0.9564
3.860	0.3904	0.9556
3.930	0.4692	0.9580
4.150	0.7129	0.9637
4.220	0.8128	0.9653
4.510	0.8886	0.9724

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 298.15

P / bar	x ₁	y ₁
2.260	0.0358	0.7811
3.750	0.0734	0.8670
4.980	0.1183	0.9009
6.300	0.2002	0.9204
7.010	0.2809	0.9297
7.460	0.3693	0.9354
7.810	0.4702	0.9389
8.230	0.6065	0.9452
8.950	0.7834	0.9579

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 323.15

P / bar	x ₁	y ₁
4.620	0.0505	0.7445
7.680	0.1118	0.8426
9.880	0.1821	0.8768
12.38	0.3258	0.9024
14.48	0.5092	0.9225
15.85	0.7293	0.9384
16.90	0.8276	0.9526
18.43	0.9386	0.9782

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 348.15

P / bar	x ₁	y ₁
3.940	0.0165	0.3884
8.320	0.0642	0.7025
9.420	0.0773	0.7341
15.83	0.2028	0.8355
20.16	0.3643	0.8713
24.17	0.6150	0.9001
28.75	0.8452	0.9419
31.39	0.9438	0.9740

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 373.15

P / bar	x ₁	y ₁
6.010	0.0137	0.2565
10.33	0.0495	0.5162
14.98	0.0960	0.6802
19.10	0.1458	0.7429
24.53	0.2469	0.7928
30.45	0.3963	0.8292
35.78	0.5794	0.8570
41.42	0.7326	0.8845
45.27	0.8542	0.9179
49.65	0.9389	0.9550

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 398.15

P / bar	x ₁	y ₁
14.99	0.0476	0.4656
21.96	0.1040	0.6209
27.90	0.1669	0.6888
34.03	0.2448	0.7296
40.75	0.3540	0.7650
50.08	0.5526	0.7964
55.26	0.6725	0.8114
56.97	0.7098	0.8125
58.90	0.7492	0.8084

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

78.95 0.3228 0.4582

T / K = 423.15

P / bar	x ₁	y ₁
16.80	0.0249	0.2485
18.50	0.0366	0.3498
24.68	0.0749	0.4581
31.35	0.1184	0.5513
40.00	0.1914	0.6267
48.30	0.2815	0.6682
53.98	0.3534	0.6875
60.20	0.4479	0.7012
66.32	0.5556	0.7001
67.45	0.5764	0.6910

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 448.15

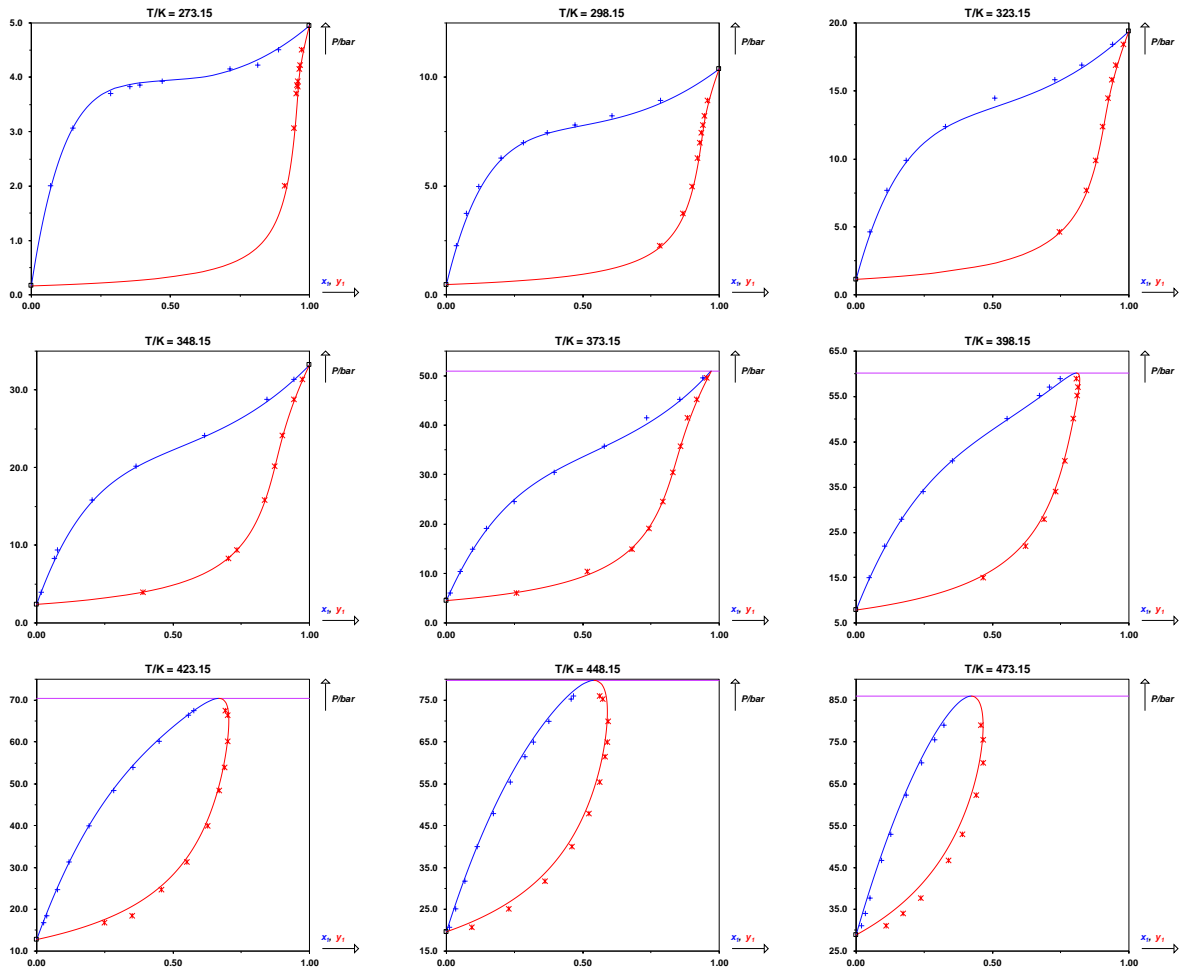
P / bar	x ₁	y ₁
20.70	0.0116	0.0919
25.18	0.0333	0.2292
31.75	0.0671	0.3609
39.95	0.1131	0.4588
47.92	0.1720	0.5227
55.38	0.2328	0.5619
61.55	0.2866	0.5820
64.94	0.3192	0.5900
69.92	0.3743	0.5921
75.33	0.4563	0.5740
76.00	0.4668	0.5623

Roth, H. - Peters-Gerth, P. - Lucas, K., Experimental vapor-liquid equilibria in the systems R 22-R 23, R 22-Co₂, Cs₂-R 22, R 23-Co₂, Cs₂-R 23 and their correlation by equations of state, Fluid Phase Equilibria. 73 (1992) 147-166. doi:10.1016/0378-3812(92)85045-A

T / K = 473.15

P / bar	x ₁	y ₁
31.12	0.0198	0.1091
34.05	0.0339	0.1716
37.71	0.0508	0.2361
46.72	0.0920	0.3393
53.00	0.1257	0.3906
62.20	0.1834	0.4405
70.00	0.2410	0.4646
75.58	0.2889	0.4668

HD-HA systems (BAC = 6)



CHLORODIFLUOROMETHANE (1) + DIMETHYL ETHER (2)

CAS	75-45-6	115-10-6
InChiKey	VOPWNXZWBVDODV-UHFFFAOYSA-N	LCGLNKUTAGEVQW-UHFFFAOYSA-N
T_c / K	369.30	400.10
P_c / bar	49.71	53.70
ω	0.219	0.200

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = -117.1

B/MPa = -303.1

Deviations

MAPE on x = 4.6 %

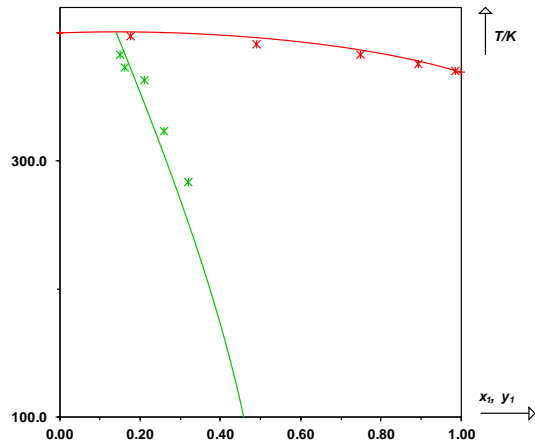
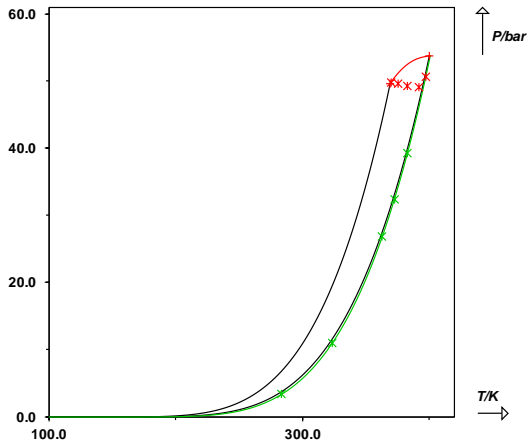
MAPE on y = 4.3 %

MAPE on x_c = 38 %

MAPE on P_c = 5.0 %

MAPE on x_{az} = 6.4 %

MAPE on P_{az} = 0.63 %



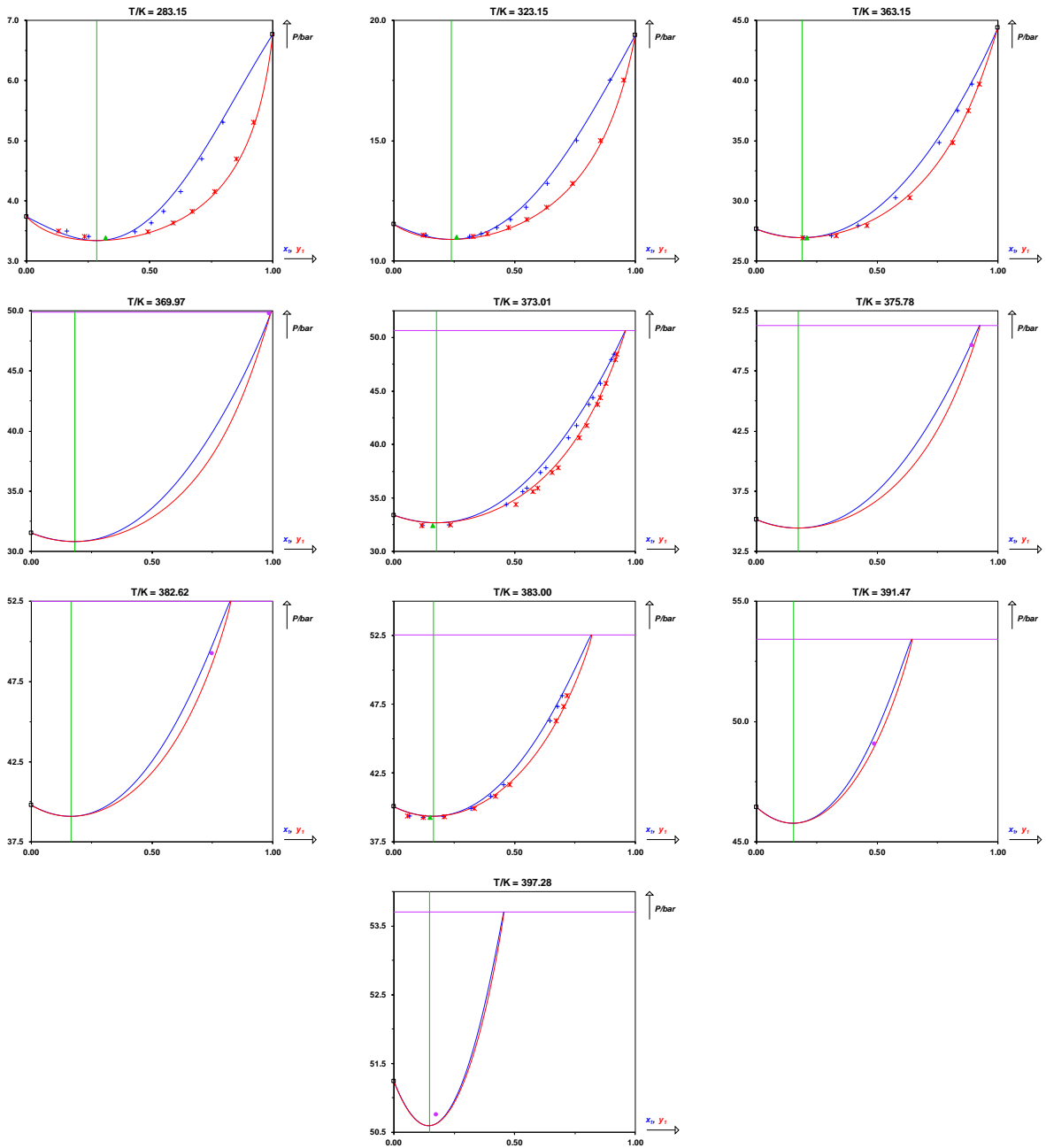
-----				39.67	0.8910	0.9220
Isothermal phase equilibrium data						

<p>Noles, Joe R. - Zollweg, John A., Vapor-liquid equilibrium for chlorodifluoromethane + dimethyl ether from 283 to 395 K at pressures to 5.0 MPa, Journal of Chemical & Engineering Data. 37 (1992) 306-310. doi:10.1021/je00007a008</p>				<p>Noles, Joe R. - Zollweg, John A., Vapor-liquid equilibrium for chlorodifluoromethane + dimethyl ether from 283 to 395 K at pressures to 5.0 MPa, Journal of Chemical & Engineering Data. 37 (1992) 306-310. doi:10.1021/je00007a008</p>		
T / K = 283.15				T / K = 373.01		
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁
3.500	0.1630	0.1300		32.44	0.1180	0.1150
3.410	0.2520	0.2350		32.41	0.1600	0.1600
3.380	0.3200	0.3200	AZEO	32.49	0.2280	0.2330
3.480	0.4390	0.4930		34.41	0.4660	0.5040
3.630	0.5050	0.5950		35.59	0.5330	0.5760
3.820	0.5570	0.6720		35.93	0.5500	0.5950
4.150	0.6250	0.7630		37.35	0.6080	0.6560
4.690	0.7120	0.8520		37.84	0.6300	0.6790
5.310	0.7980	0.9210		40.62	0.7220	0.7690
				41.75	0.7550	0.7980
				43.74	0.8060	0.8440
				44.37	0.8230	0.8560
				45.72	0.8550	0.8780
				47.90	0.9010	0.9160
				48.47	0.9120	0.9230
<p>Noles, Joe R. - Zollweg, John A., Vapor-liquid equilibrium for chlorodifluoromethane + dimethyl ether from 283 to 395 K at pressures to 5.0 MPa, Journal of Chemical & Engineering Data. 37 (1992) 306-310. doi:10.1021/je00007a008</p>				<p>Noles, Joe R. - Zollweg, John A., Vapor-liquid equilibrium for chlorodifluoromethane + dimethyl ether from 283 to 395 K at pressures to 5.0 MPa, Journal of Chemical & Engineering Data. 37 (1992) 306-310. doi:10.1021/je00007a008</p>		
T / K = 323.15				T / K = 383.00		
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁
11.08	0.1330	0.1200		39.36	0.0650	0.0570
10.98	0.2600	0.2600	AZEO	39.28	0.1220	0.1210
11.02	0.3140	0.3260		39.26	0.1500	0.1500
11.12	0.3600	0.3870		39.32	0.2050	0.2100
11.39	0.4270	0.4740		39.91	0.3180	0.3320
11.73	0.4820	0.5500		40.81	0.4000	0.4210
12.24	0.5470	0.6320		41.66	0.4540	0.4790
13.23	0.6360	0.7400		46.32	0.6460	0.6730
15.01	0.7570	0.8560		47.35	0.6780	0.7030
17.52	0.8950	0.9510		48.13	0.6960	0.7170
<p>Noles, Joe R. - Zollweg, John A., Vapor-liquid equilibrium for chlorodifluoromethane + dimethyl ether from 283 to 395 K at pressures to 5.0 MPa, Journal of Chemical & Engineering Data. 37 (1992) 306-310. doi:10.1021/je00007a008</p>				<p>-----</p>		
T / K = 363.15				Critical point		
P / bar	x ₁	y ₁		-----		
26.90	0.1950	0.1930		Noles, Joe R. - Zollweg, John A., Vapor-liquid equilibrium for chlorodifluoromethane + dimethyl ether from 283 to 395 K at pressures to 5.0 MPa, Journal of Chemical & Engineering Data. 37 (1992) 306-310. doi:10.1021/je00007a008		
26.91	0.2100	0.2100	AZEO	T / K P / bar x ₁		
27.11	0.3110	0.3300				
27.91	0.4210	0.4560				
30.23	0.5760	0.6340				
34.83	0.7570	0.8140				
37.47	0.8320	0.8780				

HD-HA systems (BAC = 6)

369.97	49.76	0.9850
375.78	49.63	0.8930
382.62	49.22	0.7480
391.47	49.08	0.4890
397.28	50.76	0.1760

HD-HA systems (BAC = 6)



CARBON DIOXIDE (1) + 1,1,1,2-TETRAFLUOROETHANE (2)

CAS	124-38-9	811-97-2
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	LVGUZGTVOIAKCC-UHFFFAOYSA-N
T_c / K	304.21	374.18
P_c / bar	73.83	40.56
ω	0.224	0.327

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 31.81$

$B/\text{MPa} = 74.55$

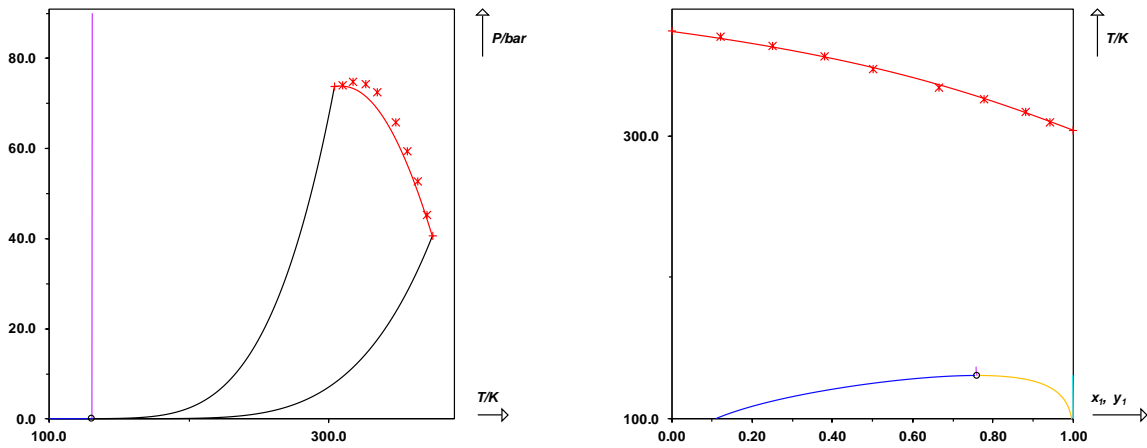
Deviations

MAPE on $x = 3.4\%$

MAPE on $y = 3.5\%$

MAPE on $x_c = 3.5\%$

MAPE on $P_c = 3.4\%$



Isothermal phase equilibrium data

Duran-Valencia, C. - Pointurier, G. - Valtz, A. - Guilbot, P. - Richon, D., Vapor–Liquid Equilibrium (VLE) Data for the Carbon Dioxide (CO₂) + 1,1,1,2-Tetrafluoroethane (R134a) System at Temperatures from 252.95 K to 292.95 K and Pressures up to 2 MPa, Journal of Chemical & Engineering Data. 47 (2002) 59-61. doi:10.1021/je010075y

T / K = 252.95

P / bar	x ₁	y ₁
5.080	0.2230	0.7720
6.830	0.3260	0.8480
8.000	0.3930	0.8780
10.03	0.5060	0.9190
13.57	0.6970	0.9540
15.76	0.8100	0.9740
16.85	0.8670	0.9830

Duran-Valencia, C. - Pointurier, G. - Valtz, A. - Guilbot, P. - Richon, D., Vapor–Liquid Equilibrium (VLE) Data for the Carbon Dioxide (CO₂) + 1,1,1,2-Tetrafluoroethane (R134a) System at Temperatures from 252.95 K to 292.95 K and Pressures up to 2 MPa, Journal of Chemical & Engineering Data. 47 (2002) 59-61. doi:10.1021/je010075y

T / K = 272.75

P / bar	x ₁	y ₁
5.340	0.0870	0.4680
6.980	0.1490	0.6070
8.620	0.2130	0.6950
9.770	0.2540	0.7380
11.55	0.3140	0.7930
14.54	0.4160	0.8490
16.07	0.4660	0.8710
18.21	0.5360	0.8950
20.33	0.6060	0.9160

Silva-Oliver, G. - Galicia-Luna, L.A., Vapor–liquid equilibria for carbon dioxide + 1,1,1,2-tetrafluoroethane (R-134a) systems at temperatures from 329 to 354 K and pressures upto 7.37 MPa, Fluid Phase Equilibria. 199 (2002) 213-222. doi:10.1016/S0378-3812(01)00816-0

T / K = 329.60

P / bar	x ₁	y ₁
19.91	0.0821	0.2412
27.85	0.2005	0.4497
34.16	0.2904	0.5566
39.44	0.3467	0.6057
46.06	0.4225	0.6570
53.73	0.5102	0.7068

59.82	0.5751	0.7363
68.13	0.6627	0.7637
71.29	0.7008	0.7693
73.69	0.7450	0.7640

Lim, Jong Sung - Jin, Jung Min - Yoo, Ki-Pung, VLE measurement for binary systems of CO₂+1,1,1,2-tetrafluoroethane (HFC-134a) at high pressures, The Journal of Supercritical Fluids. 44 (2008) 279-283. doi:10.1016/j.supflu.2007.09.025

T / K = 333.15

P / bar	x ₁	y ₁
24.30	0.1020	0.2410
28.30	0.1590	0.3500
35.00	0.2420	0.4540
41.00	0.3250	0.5390
50.90	0.4440	0.6290
58.90	0.5480	0.6900
68.00	0.6360	0.7120
69.90	0.6630	0.7010

Silva-Oliver, G. - Galicia-Luna, L.A., Vapor–liquid equilibria for carbon dioxide + 1,1,1,2-tetrafluoroethane (R-134a) systems at temperatures from 329 to 354 K and pressures upto 7.37 MPa, Fluid Phase Equilibria. 199 (2002) 213-222. doi:10.1016/S0378-3812(01)00816-0

T / K = 339.10

P / bar	x ₁	y ₁
23.05	0.0666	0.1781
28.38	0.1378	0.3141
35.01	0.2223	0.4341
41.00	0.2952	0.5087
50.91	0.4042	0.5939
58.91	0.4876	0.6399
65.65	0.5564	0.6638
70.98	0.6266	0.6612

Silva-Oliver, G. - Galicia-Luna, L.A., Vapor–liquid equilibria for carbon dioxide + 1,1,1,2-tetrafluoroethane (R-134a) systems at temperatures from 329 to 354 K and pressures upto 7.37 MPa, Fluid Phase Equilibria. 199 (2002) 213-222. doi:10.1016/S0378-3812(01)00816-0

T / K = 354.00

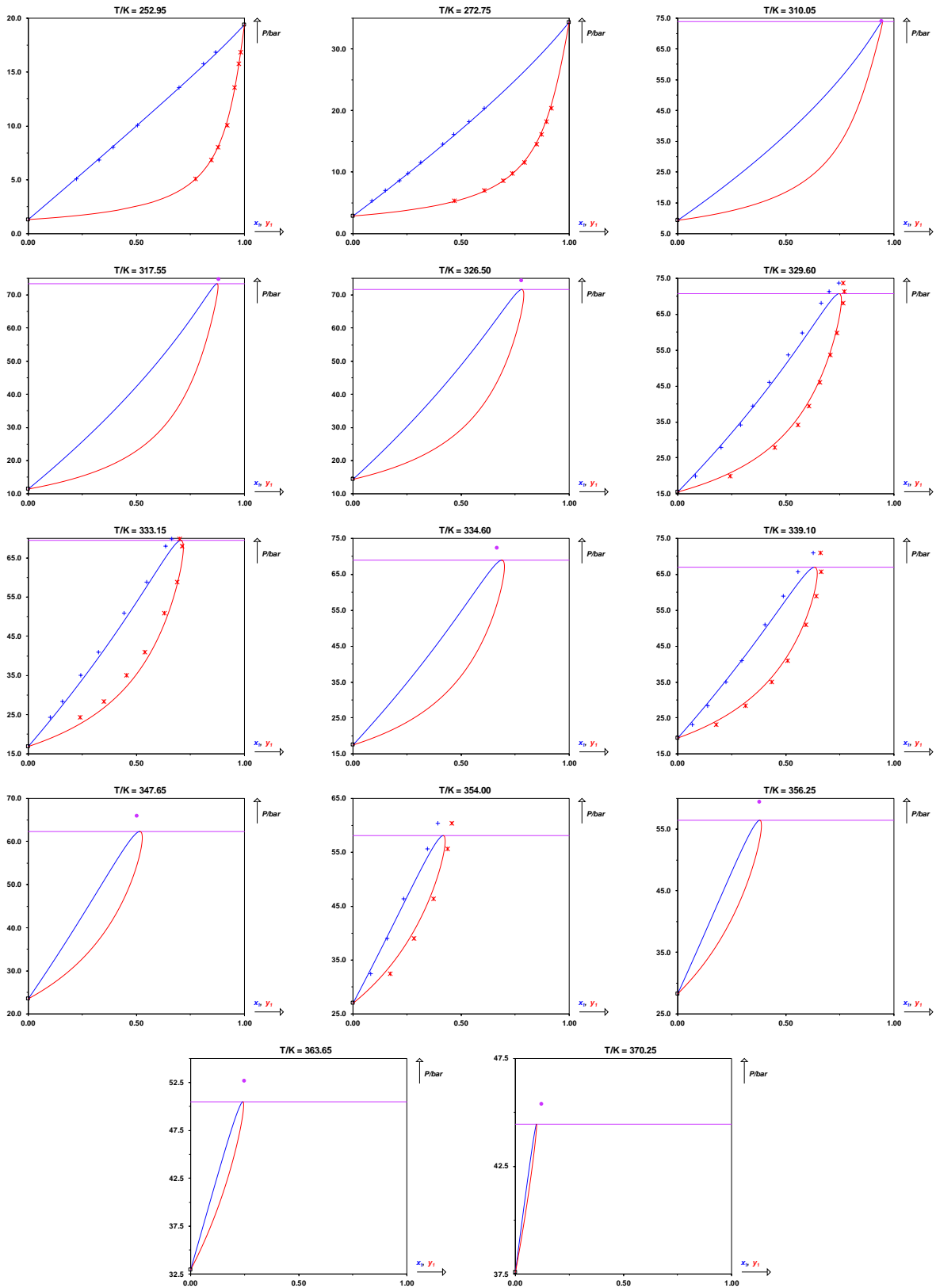
P / bar	x ₁	y ₁
32.50	0.0826	0.1733
39.00	0.1564	0.2832
46.40	0.2343	0.3735
55.63	0.3433	0.4383
60.43	0.3920	0.4560

Critical point

Uchida, Yuko - Yasumoto, Masahiko - Yamada, Yasufu - Ochi, Kenji - Furuya, Takeshi - Otake, Katsuto, Critical Properties of Four HFE + HFC Binary Systems: Trifluoromethoxymethane (HFE-143m) + Pentafluoroethane (HFC-125), + 1,1,1,2-Tetrafluoroethane (HFC-134a), + 1,1,1,2,3,3,3-Heptafluoropropane (HFC-227ea), and + 1,1,1,2,3,3-Hexafluoropropane (HFC-236ea), Journal of Chemical & Engineering Data. 49 (2004) 1615-1621. doi:10.1021/je0499723

T / K	P / bar	x_1
310.05	74.12	0.9420
317.55	74.74	0.8800
326.50	74.26	0.7780
334.60	72.39	0.6650
347.65	65.91	0.5020
356.25	59.43	0.3790
363.65	52.67	0.2490
370.25	45.37	0.1200

HD-HA systems (BAC = 6)



ACETONE (1) + CHLOROFORM (2)

CAS	67-64-1	67-66-3
InChiKey	CSCPPACGZOOCGX-UHFFFAOYSA-N	HEDRZPFGACZZDS-UHFFFAOYSA-N
T_c / K	508.20	536.40
P_c / bar	47.01	54.72
ω	0.307	0.222

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -63.84$

$B/\text{MPa} = -124.3$

Deviations

MAPE on $x = 11\%$

MAPE on $y = 12\%$

MAPE on $x_c = 34\%$

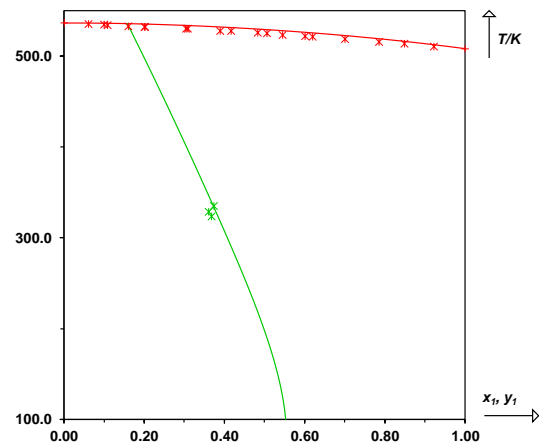
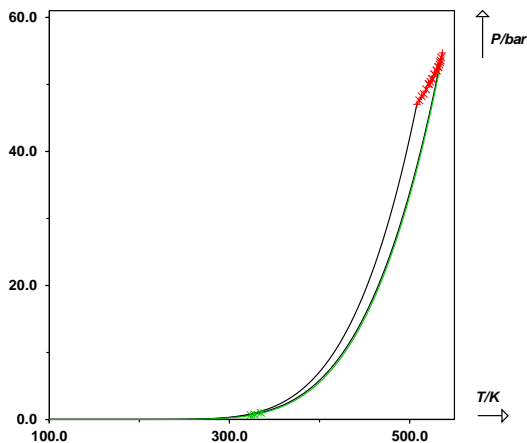
MAPE on $P_c = 0.57\%$

MAPE on $x_{az} = 2.6\%$

MAPE on $P_{az} = 1.5\%$

MAPE on $h^M = 36\%$

MAPE on $c_p^M = 54\%$



Isothermal phase equilibrium data

Röck, H. - Schröder, W., Dampf-Flüssigkeits-Gleichgewichtsmessungen im System Azeton-Chloroform, Z. Phys. Chem. NF. 11 (1957) 41-55.
doi:10.1524/zpch.1957.11.1_2.041

T / K = 288.15

P / bar	x ₁	y ₁
0.1559	0.1050	0.0500
0.1441	0.2140	0.1410
0.1380	0.3010	0.2470
0.1347	0.4050	0.4100
0.1377	0.5070	0.5730
0.1447	0.5950	0.6930
0.1557	0.6860	0.8030
0.1693	0.7970	0.8960
0.1821	0.8920	0.9520

Röck, H. - Schröder, W., Dampf-Flüssigkeits-Gleichgewichtsmessungen im System Azeton-Chloroform, Z. Phys. Chem. NF. 11 (1957) 41-55.
doi:10.1524/zpch.1957.11.1_2.041

T / K = 293.15

P / bar	x ₁	y ₁
0.1971	0.1050	0.0530
0.1832	0.2140	0.1410
0.1749	0.3020	0.2520
0.1720	0.4050	0.4100
0.1756	0.5070	0.5690
0.1844	0.5950	0.6870
0.1971	0.6850	0.7960
0.2140	0.7970	0.8930
0.2291	0.8930	0.9520

Röck, H. - Schröder, W., Dampf-Flüssigkeits-Gleichgewichtsmessungen im System Azeton-Chloroform, Z. Phys. Chem. NF. 11 (1957) 41-55.
doi:10.1524/zpch.1957.11.1_2.041

T / K = 303.15

P / bar	x ₁	y ₁
0.3041	0.1050	0.0560
0.2870	0.1970	0.1360
0.2738	0.2990	0.2550
0.2694	0.4000	0.4090
0.2764	0.5030	0.5670
0.2890	0.5910	0.6890
0.3093	0.6970	0.8060
0.3320	0.8010	0.8890
0.3558	0.8990	0.9530

Kudryavtseva, L.S. - Susarev, M.P., Liquid-vapor equilibrium in systems chloroform-hexane and acetone-chloroform, J. Appl. Chem. USSR. 36 (1963) 1231-1237.

T / K = 308.15

P / bar	x ₁	y ₁
0.3729	0.1007	0.0590
0.3528	0.2007	0.1440
0.3389	0.3018	0.2700
0.3352	0.3982	0.4100
0.3441	0.4987	0.5580
0.3589	0.5905	0.6800
0.3842	0.6972	0.8050
0.4100	0.7961	0.8880
0.4361	0.8921	0.9510

Kudryavtseva, L.S. - Susarev, M.P., Liquid-vapor equilibrium in systems chloroform-hexane and acetone-chloroform, J. Appl. Chem. USSR. 36 (1963) 1231-1237.

T / K = 318.15

P / bar	x ₁	y ₁
0.5537	0.1005	0.0610
0.5265	0.2005	0.1430
0.5089	0.3013	0.2670
0.5066	0.3967	0.4080
0.5204	0.4880	0.5450
0.5384	0.5915	0.6760
0.5722	0.6945	0.8000
0.6074	0.7941	0.8830
0.6465	0.8936	0.9490

Vilim, O. - Hala, E. - Fried, V. - Pick, J., Liquid-vapor equilibria. XII. Fractional steam distillation of the system o-nitroethylbenzene-p-nitroethylbenzene, Chem. Listy. 48 (1954) 1109-1113.

T / K = 323.15

P / bar	x ₁	y ₁
0.6850	0.0230	0.0086
0.6763	0.0500	0.0201
0.6638	0.0900	0.0408
0.6605	0.1000	0.0464
0.6493	0.1350	0.0719
0.6442	0.1520	0.0863
0.6416	0.1600	0.0935
0.6277	0.2040	0.1383
0.6190	0.2360	0.1760
0.6149	0.2500	0.1930
0.6088	0.3000	0.2582
0.6056	0.3500	0.3382
0.6053	0.3640	0.3608
0.6054	0.3680	0.3675
0.6054	0.3683	0.3683

AZEO

HD-HA systems (BAC = 6)

0.6057	0.3900	0.4032	334.94	0.2740	0.2380	
0.6065	0.4200	0.4511	335.15	0.3210	0.2970	
0.6104	0.4500	0.4963	335.22	0.3500	0.3450	
0.6142	0.4690	0.5240	335.16	0.3740	0.3740	AZEO
0.6217	0.5000	0.5670	335.13	0.3900	0.4000	
0.6317	0.5390	0.6211	335.00	0.4170	0.4330	
0.6346	0.5500	0.6370	334.88	0.4410	0.4710	
0.6485	0.6000	0.6978	334.83	0.4510	0.4820	
0.6521	0.6120	0.7113	334.42	0.5070	0.5600	
0.6550	0.6220	0.7222	333.90	0.5600	0.6290	
0.6638	0.6500	0.7528	333.27	0.6090	0.6910	
0.6823	0.7000	0.8028	332.70	0.6470	0.7390	
0.7029	0.7500	0.8515	331.81	0.7060	0.8000	
0.7249	0.8000	0.8955	331.05	0.7550	0.8450	
0.7479	0.8500	0.9319	330.40	0.7940	0.8760	
0.7710	0.9000	0.9614	329.60	0.8430	0.9120	
0.7943	0.9500	0.9829	328.85	0.8890	0.9430	
			328.06	0.9390	0.9720	

Beckmann, E. - Faust, O., Die Dampfspannung der Aceton-Chloroformgemische in Abhängigkeit von der Temperatur, Zeitschrift für Physikalische Chemie. 89U (1914) doi:10.1515/zpch-1914-8917

T / K = 328.25		
P / bar	x ₁	y ₁
0.8013	0.1180	0.0910
0.7699	0.2340	0.1900
0.7469	0.3600	0.3600
0.7487	0.3850	0.4000
0.7698	0.5080	0.5570
0.7966	0.5820	0.6770
0.8175	0.6450	0.7380
0.8527	0.7210	0.8120
0.9265	0.9000	0.9440

Isobaric phase equilibrium data

Segura, Hugo - Mejía, Andrés - Reich, Ricardo - Wisniak, Jaime - Loras, Sonia, Isobaric Vapor-Liquid Equilibria and Densities for the Binary Systems Oxolane + Ethyl 1,1-Dimethylethyl Ether, Oxolane + 2-Propanol and Propan-2-One + Trichloromethane, Physics and Chemistry of Liquids. 41 (2003) 283-301. doi:10.1080/0031910021000044456

P / bar = 0.9400		
T / K	x ₁	y ₁
332.47	0.0420	0.0240
333.16	0.1020	0.0650
333.66	0.1510	0.1070
334.05	0.1830	0.1380
334.58	0.2340	0.1900

Enthalpy of mixing

Sabinin, V.E. - Belousov, V.P. - Morachevskii, A.G., Heats of mixing and evaporation in the acetonechloroform system, Izv. Vyssh. Uchebn. Zaved. Khim. Khim. Tekhnol. 10 (1967) 34-38.

T / K = 283.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
-1243.5	0.1670
-1871.5	0.3330
-1946.9	0.3770
-1972.0	0.3900
-1984.5	0.4590
-1967.8	0.5230
-1310.5	0.7270
-937.84	0.8110

Kulanek, M. - Bittrich, H.J., Heat of solution of the system acetone-chloroform, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 4 (1962) 139-141.

T / K = 287.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
-1477.9	0.1860
-2089.2	0.3400
-2202.3	0.4690
-2106.0	0.5780
-1829.6	0.6730
-1461.2	0.7550

HD-HA systems (BAC = 6)

-979.71	0.8270	-1676.2	0.6060
-632.21	0.8910	-1517.1	0.6579
		-1327.8	0.7113

Akamatsu, Yutaka - Ogawa, Hideo - Murakami, Sachio, Molar excess enthalpies, molar excess volumes and molar isentropic compressions of mixtures of 2-propanone with heptane, benzene and trichloromethane at 298.15 K, *Thermochimica Acta.* 113 (1987) 141-150. doi:10.1016/0040-6031(87)88317-X

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

-402.10	0.0500
-764.60	0.1001
-1091.4	0.1501
-1362.4	0.2001
-1588.7	0.2501
-1756.8	0.3001
-1870.7	0.3501
-1933.5	0.4001
-1941.0	0.4502
-1904.4	0.5002
-1822.0	0.5501
-1705.7	0.6001
-1554.0	0.6501
-1381.6	0.7001
-1179.2	0.7501
-970.50	0.8001
-741.60	0.8501
-501.20	0.9000
-227.70	0.9500

Nagata, Isamu - Tamura, Kazuhiro - Tokuriki, Shinji, Excess enthalpies and complex formation of acetonitrile with acetone, chloroform, and benzene, *Thermochimica Acta.* 47 (1981) 315-331. doi:10.1016/0040-6031(81)80110-4

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

-174.60	0.0218
-588.20	0.0762
-940.30	0.1273
-1228.1	0.1757
-1475.8	0.2249
-1657.9	0.2706
-1811.2	0.3251
-1899.8	0.3812
-1929.5	0.4395
-1903.8	0.4871
-1840.5	0.5321
-1756.3	0.5744

-1108.6	0.7648
-891.50	0.8149
-662.60	0.8645
-451.20	0.9088
-226.90	0.9547
-78.20	0.9844

Morris, John W. - Mulvey, Patrick J. - Abbott, Michael M. - Van Ness, Hendrick C., Excess thermodynamic functions for ternary systems. I. Acetone-chloroform-methanol at 50.deg., *Journal of Chemical & Engineering Data.* 20 (1975) 403-405. doi:10.1021/je60067a019

T / K = 323.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

-137.60	0.0185
-382.90	0.0527
-670.80	0.0961
-1041.9	0.1601
-1378.2	0.2331
-1602.2	0.3017
-1713.9	0.3555
-1771.7	0.4114
-1772.5	0.4672
-1746.7	0.5021
-1703.4	0.5361
-1433.5	0.6583
-1261.4	0.7110
-1058.6	0.7654
-784.40	0.8318
-447.40	0.9067
-226.80	0.9532

Heat capacity of mixing

Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, *ELDATA Int. Electron. J. Phys. Chem. Data.* 1 (1995) 217-237.

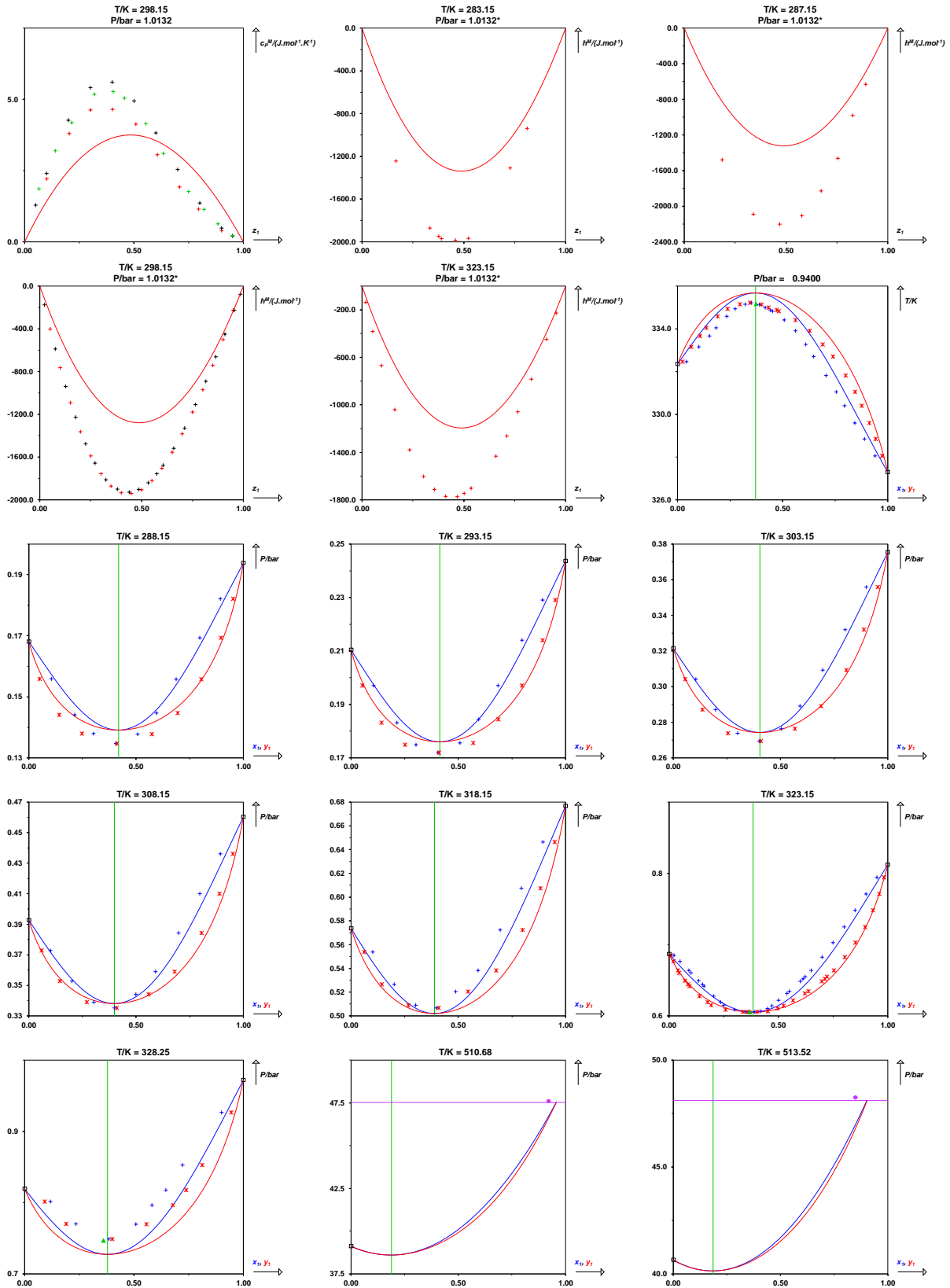
T / K = 298.15

P / bar = UNKNOWN (1.0132)

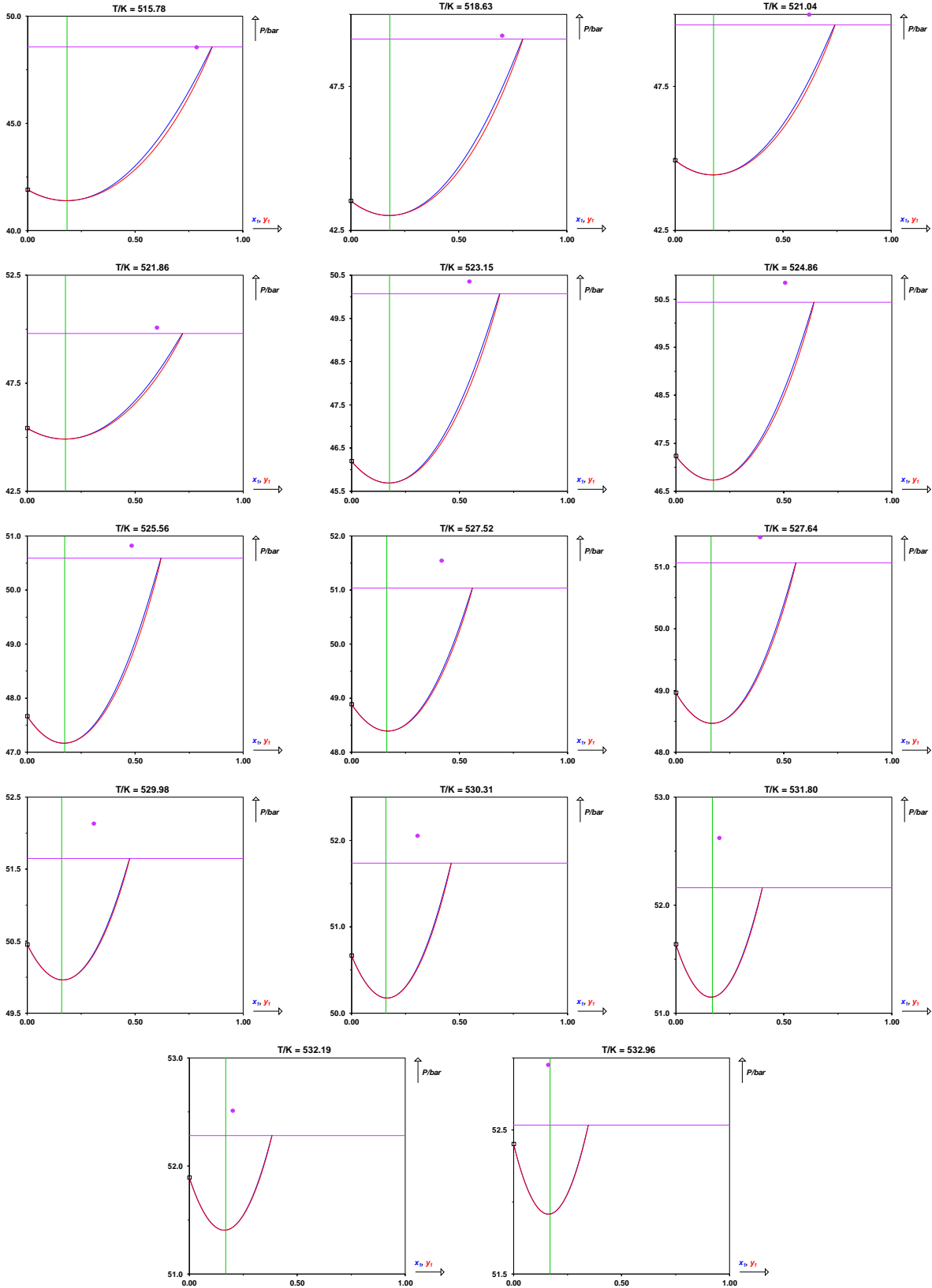
$c_P^M / \text{J.mol}^{-1} \cdot \text{K}^{-1}$ x_1

2.210	0.1008
3.800	0.2041
4.630	0.3010

HD-HA systems (BAC = 6)



HD-HA systems (BAC = 6)



CHLOROFORM (1) + TETRAHYDROFURAN (2)

CAS	67-66-3	109-99-9
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	WYURNTSHIVDZCO-UHFFFAOYSA-N
T_c / K	536.40	540.15
P_c / bar	54.72	51.90
ω	0.222	0.225

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results
Parameters

$A/\text{MPa} = -119.4$

$B/\text{MPa} = -235.9$

Deviations

MAPE on $x = 5.8 \%$

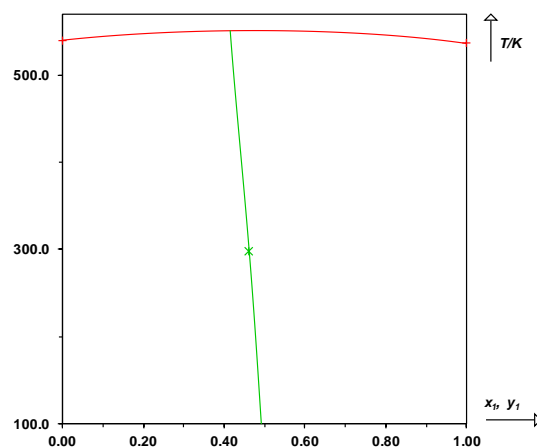
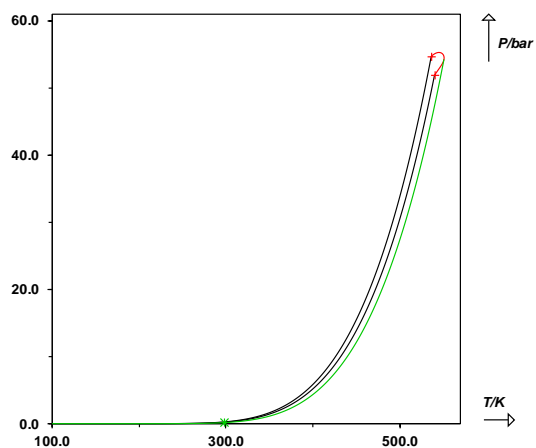
MAPE on $y = 7.1 \%$

MAPE on $x_{az} = 0.33 \%$

MAPE on $P_{az} = 0.14 \%$

MAPE on $h^M = 9.0 \%$

MAPE on $c_p^M = 21 \%$



HD-HA systems (BAC = 6)

Isothermal phase equilibrium data	0.3078	0.3476	0.2766
Haase, R. - Tillmann, W., Negative values of the entropy of mixing, Z. Phys. Chem. Munich. 175 (1992) 209-216.	0.3026	0.3855	0.3349
T / K = 298.15	0.2990	0.4278	0.4059
P / bar	0.2984	0.4458	0.4380
x ₁	0.2975	0.4518	0.4486
y ₁	0.2979	0.4778	0.4954
0.2058	0.2987	0.4814	0.5018
0.1998	0.2991	0.4927	0.5232
0.1899	0.3012	0.5125	0.5589
0.1695	0.3038	0.5311	0.5922
0.1593	0.3063	0.5517	0.6279
0.1558	0.3099	0.5703	0.6594
0.1565	0.3119	0.5798	0.6743
0.1640	0.3286	0.6377	0.7630
0.1779	0.3485	0.6933	0.8326
0.2114	0.3555	0.7113	0.8513
0.2412	0.3770	0.7622	0.8954
Paul, H.I., Experimentelle untersuchung der Fliissigkeits-Dampf-Phasengleichgewichte und Volumetrischen Eigenschaften BinHrer und Ternlrer Mischungen, VDI Forschungsh. Reihe 3 Verfahrenst. 135 (1987)	0.4182	0.8531	0.9531
T / K = 303.15	0.4193	0.8547	0.9540
P / bar	0.4475	0.9191	0.9783
x ₁	Paul, H.I., Experimentelle untersuchung der Fliissigkeits-Dampf-Phasengleichgewichte und Volumetrischen Eigenschaften BinHrer und Ternlrer Mischungen, VDI Forschungsh. Reihe 3 Verfahrenst. 135 (1987)		
y ₁	T / K = 323.15		
0.2551	P / bar		
0.2337	x ₁		
0.2151	y ₁		
0.2003	0.5784	0.0194	0.0068
0.1963	0.5563	0.0737	0.0300
0.1943	0.5353	0.1262	0.0586
0.1936	0.5315	0.1357	0.0649
0.1971	0.5122	0.1824	0.0989
0.2067	0.5009	0.2133	0.1263
0.2092	0.4905	0.2392	0.1510
0.2263	0.4716	0.2980	0.2169
0.2713	0.4650	0.3216	0.2478
0.3156	0.4598	0.3429	0.2773
Paul, H.I., Experimentelle untersuchung der Fliissigkeits-Dampf-Phasengleichgewichte und Volumetrischen Eigenschaften BinHrer und Ternlrer Mischungen, VDI Forschungsh. Reihe 3 Verfahrenst. 135 (1987)	0.4542	0.3720	0.3202
T / K = 313.15	0.4532	0.3814	0.3341
P / bar	0.4495	0.4105	0.3814
x ₁	0.4485	0.4166	0.3907
y ₁	0.4473	0.4441	0.4381
0.3947	0.4474	0.4578	0.4619
0.3690	0.4474	0.4725	0.4873
0.3471	0.4475	0.4802	0.5008
0.3398	0.4555	0.5386	0.6024
0.3287	0.4750	0.6098	0.7143
0.3166	0.5043	0.6777	0.8038
Paul, H.I., Experimentelle untersuchung der Fliissigkeits-Dampf-Phasengleichgewichte und Volumetrischen Eigenschaften BinHrer und Ternlrer Mischungen, VDI Forschungsh. Reihe 3 Verfahrenst. 135 (1987)	0.5694	0.7920	0.9109
T / K = 313.15	0.6110	0.8586	0.9509
P / bar			
x ₁			
y ₁			
0.3947			
0.3690			
0.3471			
0.3398			
0.3287			
0.3166			

HD-HA systems (BAC = 6)

0.6364	0.8997	0.9694	-2548.6	0.4072
0.6709	0.9548	0.9885	-2639.7	0.4453
-----			-2697.6	0.4867
Enthalpy of mixing			-2708.8	0.5307
-----			-2678.5	0.5704
Suri, S.K. - Maheshwari, R.C., Molar excess enthalpies of			-2617.5	0.6039
arsenic tribromide + benzene, +cyclohexane, and			-2513.1	0.6413
+tetrachloromethane at 313.15 K, The Journal of			-2355.9	0.6824
Chemical Thermodynamics. 12 (1980) 1191-1192.			-2145.0	0.7261
doi:10.1016/S0021-9614(80)80013-9			-1989.5	0.7535
T / K =	283.15		-1779.1	0.7871
P / bar =	UNKNOWN (1.0132)		-1624.8	0.8096
$h^M / \text{J.mol}^{-1}$	x_1		-1428.6	0.8366
-807.00	0.1005		-1261.4	0.8583
-1185.2	0.1507		-1031.1	0.8866
-1557.5	0.2008		-857.40	0.9072
-1893.8	0.2510		-619.70	0.9341
-2195.0	0.3011		-419.20	0.9560
-2461.2	0.3512		-234.00	0.9756
-2670.7	0.4012		-141.20	0.9853
-2813.2	0.4513		-69.50	0.9927
-2868.0	0.5013			
-2895.5	0.5513		van Ness, H.C. - Abbott, M.M., Excess enthalpy.	
-2814.8	0.6012		Trichloromethane (chloroform)-oxolane	
-2659.7	0.6512		(tetrahydrofuran) system, Int. Data Ser. Sel. Data Mixtures	
-2433.2	0.7011		Ser. A. 1974 (1974)	
-2154.1	0.7510		T / K =	318.15
-1811.2	0.8008		P / bar =	2.100
-1419.7	0.8507		$h^M / \text{J.mol}^{-1}$	z_1
-981.30	0.9005		-117.30	0.0144
			-316.80	0.0392
			-546.80	0.0684
van Ness, H.C. - Abbott, M.M., Excess enthalpy.			-777.50	0.0988
Trichloromethane (chloroform)-oxolane			-997.50	0.1286
(tetrahydrofuran) system, Int. Data Ser. Sel. Data Mixtures			-1256.2	0.1658
Ser. A. 1974 (1974)			-1531.6	0.2081
T / K =	303.15		-1733.4	0.2417
P / bar =	2.100		-1952.0	0.2819
$h^M / \text{J.mol}^{-1}$	z_1		-2097.3	0.3118
-115.90	0.0138		-2200.6	0.3355
-213.30	0.0255		-2313.1	0.3644
-326.40	0.0393		-2406.8	0.3934
-573.40	0.0696		-2479.9	0.4207
-800.80	0.0987		-2541.8	0.4523
-990.90	0.1238		-2571.9	0.5633
-1294.7	0.1656		-2526.1	0.5934
-1618.4	0.2138		-2440.9	0.6293
-1887.5	0.2578		-2317.9	0.6669
-2099.7	0.2965		-2159.7	0.7048
-2256.5	0.3288		-1965.0	0.7435
-2419.0	0.3680			

-1726.9	0.7842
-1479.1	0.8217
-1268.7	0.8510
-1120.6	0.8704
-898.50	0.8983
-679.20	0.9246
-474.10	0.9481
-276.70	0.9702
-109.60	0.9883

Azeotropic point

Paul, H.I., Experimentelle untersuchung der Flüssigkeits-Dampf-Phasengleichgewichte und Volumetrischen Eigenschaften Binärer und Ternärer Mischungen, VDI Forschungsh. Reihe 3 Verfahrenst. 135 (1987)

T / K	P / bar	x ₁
298.15	0.1558	0.4600

Heat capacity of mixing

Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 217-237.

T / K = 298.15
P / bar = UNKNOWN (1.0132)

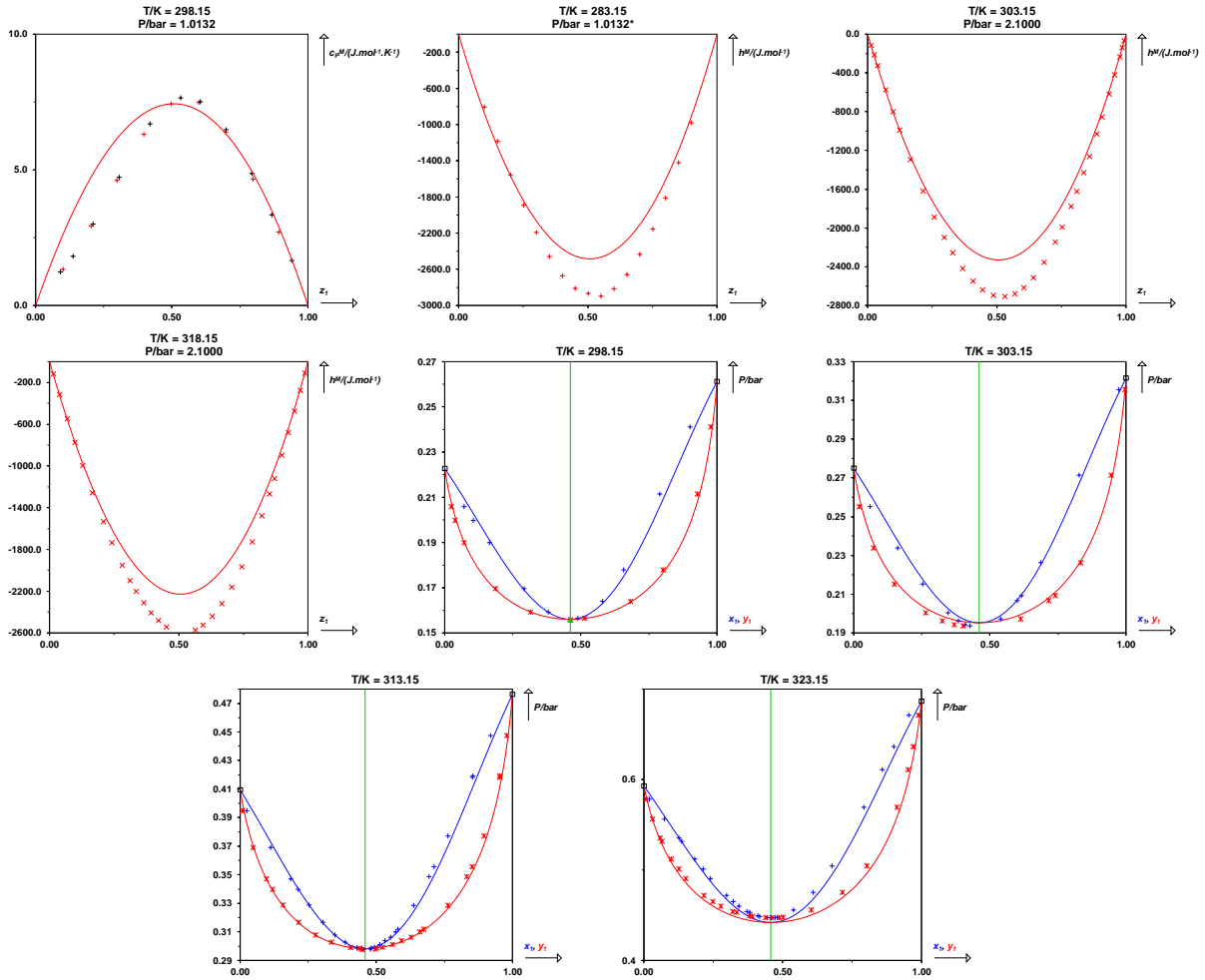
cp ^M / J.mol ⁻¹ .K ⁻¹	x ₁
1.330	0.1012
2.930	0.2036
4.610	0.2981
6.310	0.3969
7.430	0.4968
7.480	0.5992
6.400	0.6980
4.650	0.7981
2.710	0.8926

Inglese, Americo - Castagnolo, Maurizio - Dell'atti, Angelo - de Giglio, Angelo, Excess heat capacities and excess volumes of binary liquid mixtures of chloroform with cyclic ethers at 298.15 K, Thermochimica Acta. 44 (1981) 77-87. doi:10.1016/0040-6031(81)80273-0

T / K = 298.15
P / bar = UNKNOWN (1.0132)

cp ^M / J.mol ⁻¹ .K ⁻¹	x ₁
1.231	0.0904
1.814	0.1374
3.000	0.2112
4.722	0.3066
6.687	0.4195
7.655	0.5321
7.512	0.6052
6.480	0.6994
4.861	0.7934
3.341	0.8668
1.652	0.9413

HD-HA systems (BAC = 6)



METHYL ACETATE (1) + CHLOROFORM (2)

CAS	79-20-9	67-66-3
InChiKey	KXKVLQRXCPHEJC-UHFFFAOYSA-N	HEDRZPFGACZZDS-UHFFFAOYSA-N
T_c / K	506.55	536.40
P_c / bar	47.50	54.72
ω	0.331	0.222

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -64.21$

$B/\text{MPa} = -126.5$

Deviations

MAPE on $x = 9.8\%$

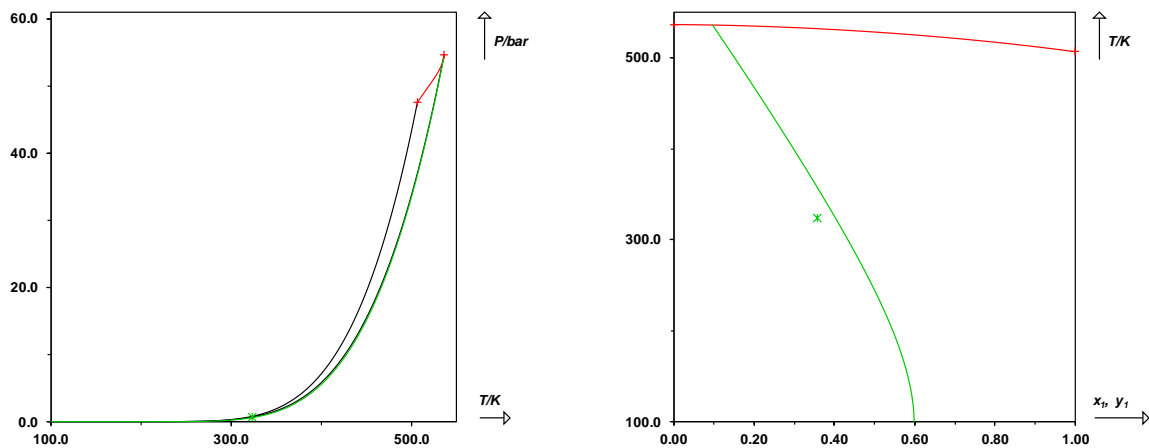
MAPE on $y = 11\%$

MAPE on $x_{az} = 10\%$

MAPE on $P_{az} = 0.06\%$

MAPE on $h^M = 26\%$

MAPE on $c_p^M = 36\%$



Isothermal phase equilibrium data

Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378-3812(80)80008-2

T / K =	313.15	
P / bar	x ₁	y ₁
0.4610	0.0590	0.0320
0.4398	0.1320	0.0830
0.4314	0.1640	0.1170
0.4190	0.2250	0.1890
0.4062	0.3560	0.3460
0.4080	0.3920	0.4040
0.4113	0.4470	0.4800
0.4132	0.4730	0.5170
0.4178	0.5050	0.5650
0.4276	0.5670	0.6480
0.4361	0.6040	0.6910
0.4624	0.7280	0.8220
0.4673	0.7410	0.8330
0.4800	0.7880	0.8720
0.4930	0.8410	0.9080
0.5277	0.9460	0.9730

Nagata, Isamu - Hayashida, Hiromichi, Vapor-Liquid Equilibrium Data For The Ternary Systems: Methyl Acetate-2-Propanol-Benzene And Methyl Acetate-Chloroform-Benzene, Journal of Chemical Engineering of Japan. 3 (1970) 161-166. doi:10.1252/jcej.3.161

T / K =	323.15	
P / bar	x ₁	y ₁
0.6670	0.0640	0.0400
0.6426	0.1340	0.0890
0.6294	0.1780	0.1310
0.6074	0.2580	0.2200
0.6001	0.3140	0.3080
0.5988	0.3560	0.3540
0.5988	0.3570	0.3570
0.6008	0.3940	0.4050
0.6050	0.4380	0.4700
0.6108	0.4770	0.5260
0.6204	0.5250	0.5840
0.6448	0.6120	0.6980
0.6773	0.7070	0.7960
0.6837	0.7260	0.8140
0.6906	0.7470	0.8350
0.7135	0.8150	0.8860
0.7625	0.9350	0.9660

AZEO

Enthalpy of mixing

Ortega, J. - Placido, J., Excess enthalpies of 14 binary liquid mixtures of trichloromethane + methyl n-alkanoates (C3-C16) at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 2 (1996) 85-96.

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-456.50	0.0613	
-802.90	0.1147	
-1119.6	0.1678	
-1368.4	0.2177	
-1560.3	0.2656	
-1705.9	0.3132	
-1804.8	0.3602	
-1859.2	0.4059	
-1876.9	0.4504	
-1860.2	0.4944	
-1781.0	0.5413	
-1660.9	0.5868	
-1504.4	0.6391	
-1303.1	0.6945	
-1089.7	0.7527	
-837.60	0.8126	
-588.10	0.8677	
-349.20	0.9194	
-185.30	0.9591	

Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378-3812(80)80008-2

T / K =	308.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-125.50	0.0170	
-330.80	0.0470	
-731.70	0.1130	
-1075.9	0.1810	
-1304.5	0.2400	
-1475.8	0.3010	
-1574.8	0.3620	
-1609.8	0.4130	
-1593.4	0.4750	
-1551.4	0.5200	
-1485.6	0.5610	
-1369.2	0.6160	

-1104.0	0.7100
-873.00	0.7780
-591.00	0.8530
-374.80	0.9090
-148.60	0.9650

Heat capacity of mixing

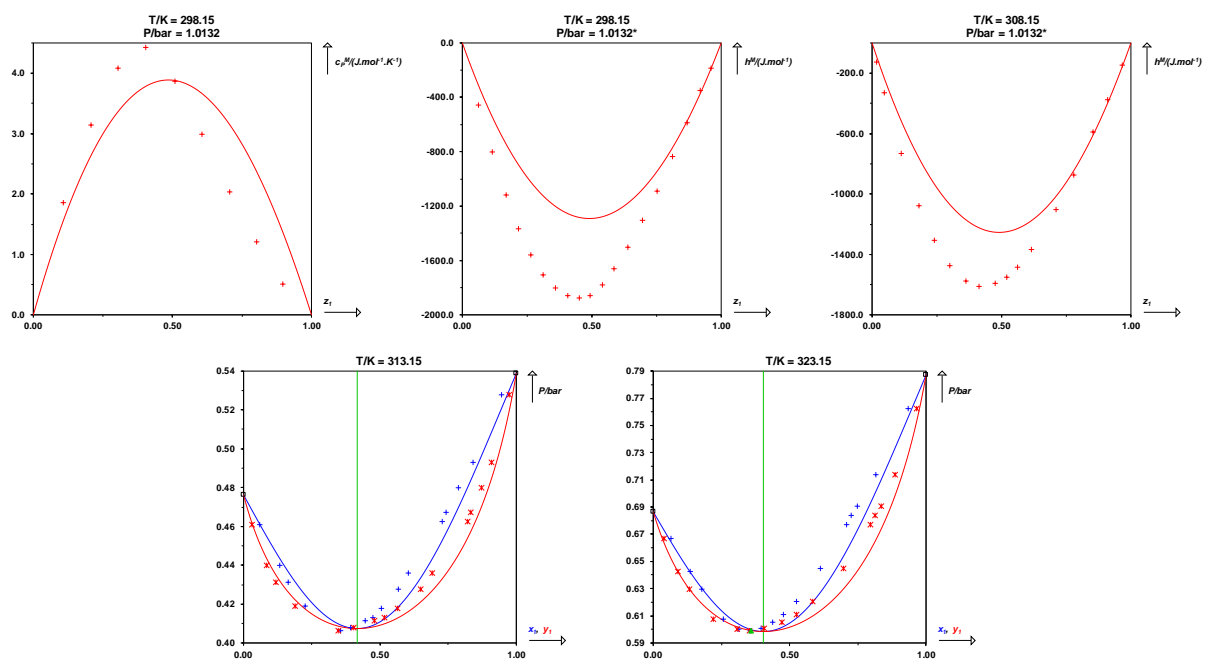
Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 217-237.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
1.850	0.1081
3.140	0.2064
4.080	0.3043
4.420	0.4048
3.870	0.5093
2.990	0.6069
2.040	0.7046
1.210	0.8023
0.5100	0.8981

HD-HA systems (BAC = 6)



CHLOROFORM (1) + ETHYL ACETATE (2)

CAS	67-66-3	141-78-6
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	XEKOWRVHYACXOJ-UHFFFAOYSA-N
T_c / K	536.40	523.30
P_c / bar	54.72	38.80
ω	0.222	0.366

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results
Parameters

$A/\text{MPa} = -90.37$

$B/\text{MPa} = -364.9$

Deviations

MAPE on $x = 6.8\%$

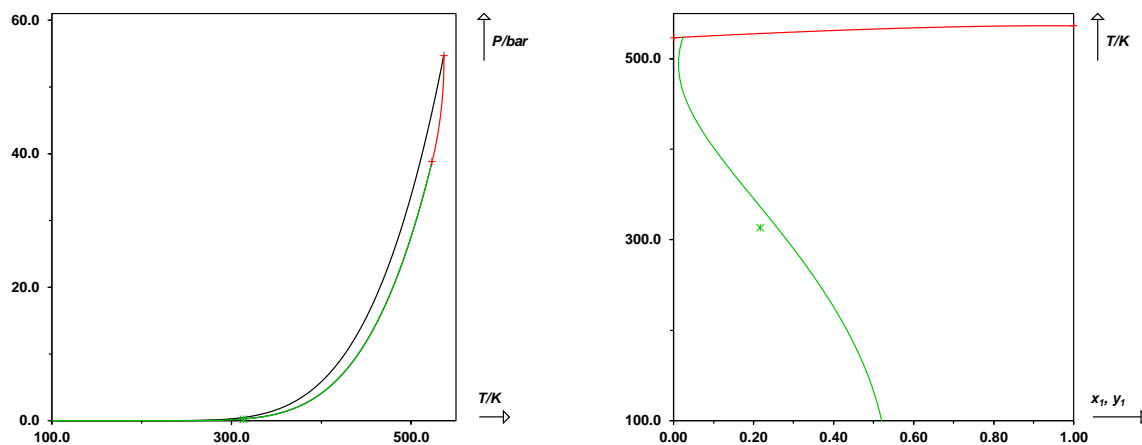
MAPE on $y = 9.5\%$

MAPE on $x_{az} = 13\%$

MAPE on $P_{az} = 1.3\%$

MAPE on $h^M = 69\%$

MAPE on $c_p^M = 200\%$



-----				350.65	0.2590	0.2700
Isothermal phase equilibrium data				350.45	0.3010	0.3230
-----				349.95	0.3650	0.4080
Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378- 3812(80)80008-2				349.15	0.4480	0.5220
T / K = 313.15				348.25	0.5040	0.5960
P / bar	x_1	y_1		347.85	0.5280	0.6280
0.2456	0.0680	0.0570		346.65	0.5810	0.7000
0.2410	0.1680	0.1590		344.95	0.6500	0.7800
0.2428	0.2160	0.2160	AZEO	343.55	0.7040	0.8390
0.2440	0.2360	0.2410		342.05	0.7510	0.8790
0.2442	0.3050	0.3320		340.85	0.7900	0.9100
0.2485	0.3740	0.4340		338.75	0.8560	0.9500
0.2566	0.4260	0.5080		336.85	0.9220	0.9780
0.2701	0.5160	0.6380		-----		
0.2956	0.6150	0.7750		Enthalpy of mixing		
0.3640	0.7900	0.9320		-----		
0.3873	0.8390	0.9550		Ortega, J., Excess enthalpy. Trichloromethane-ethyl methanoate system, Int. Data Ser. Sel. Data Mixtures Ser. A. 21 (1993)		
0.4628	0.9660	0.9940		T / K = 298.15		
Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378- 3812(80)80008-2				P / bar = 1.010		
T / K = 323.15				$h^M / J.mol^{-1}$	z_1	
P / bar	x_1	y_1		-253.80	0.0540	
0.3774	0.0570	0.0490		-501.10	0.1129	
0.3732	0.2480	0.2590		-800.50	0.1748	
0.3752	0.2840	0.3050		-1110.1	0.2360	
0.3824	0.3860	0.4450		-1361.5	0.2896	
0.4025	0.4840	0.5860		-1575.1	0.3370	
0.4089	0.5140	0.6320		-1777.9	0.3871	
0.4494	0.6160	0.7580		-1912.8	0.4273	
0.5373	0.7870	0.9150		-2029.2	0.4710	
0.6430	0.9350	0.9880		-2098.6	0.5078	
-----				-2145.3	0.5440	
Isobaric phase equilibrium data				-2159.2	0.5988	
-----				-2123.3	0.6451	
Nagata, Isamu, Isobaric Vapor-Liquid Equilibria for the Ternary System Chloroform-Methanol-Ethyl Acetate., Journal of Chemical & Engineering Data. 7 (1962) 367-373. doi:10.1021/je60014a013				-2047.9	0.6840	
P / bar = 1.013				-1923.1	0.7232	
T / K	x_1	y_1		-1772.3	0.7604	
350.65	0.0710	0.0640		-1609.5	0.7925	
350.75	0.1100	0.1020		-1403.6	0.8269	
350.85	0.1400	0.1340		-1165.0	0.8631	
				-887.10	0.9010	
				-596.40	0.9364	
				-323.40	0.9656	
				Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378- 3812(80)80008-2		

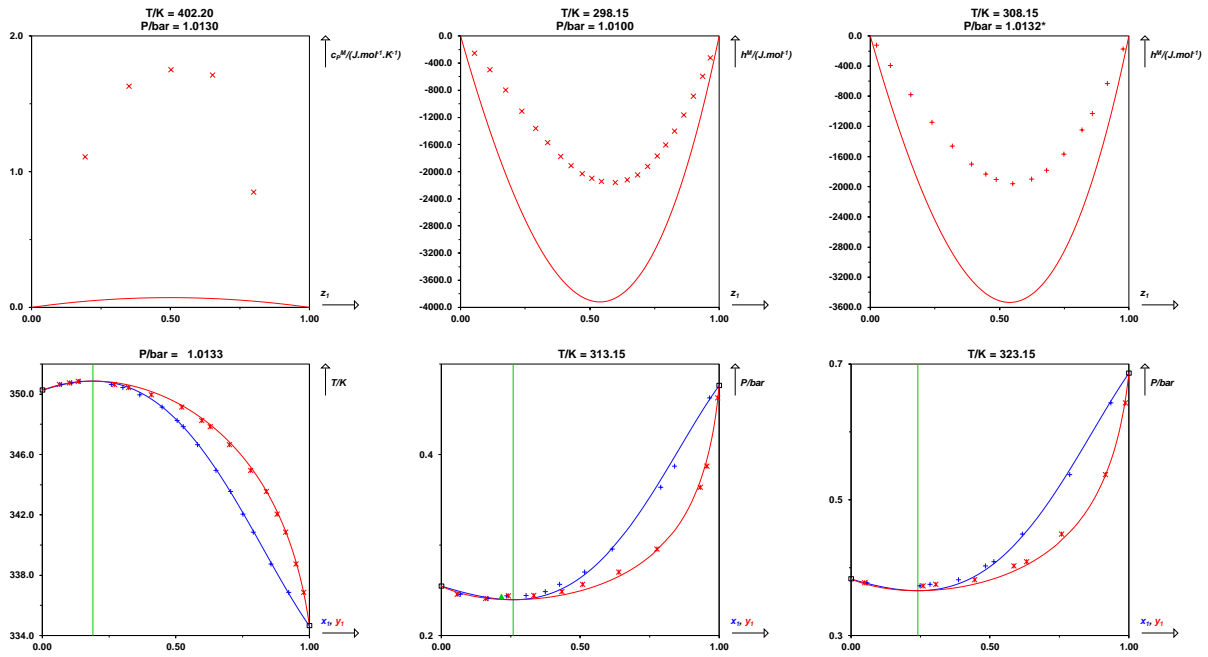
T / K =	308.15
P / bar =	UNKNOWN (1.0132)
$h^M / \text{J.mol}^{-1}$	x_1
-121.10	0.0240
-391.40	0.0770
-778.90	0.1560
-1147.2	0.2380
-1460.0	0.3170
-1698.4	0.3910
-1833.8	0.4460
-1902.1	0.4860
-1957.9	0.5500
-1898.2	0.6240
-1781.7	0.6820
-1569.1	0.7480
-1245.6	0.8180
-1027.3	0.8580
-633.10	0.9170
-176.30	0.9770

Heat capacity of mixing

Fang, Wen-jun - Yu, Qing-sen - Lin, Rui-sen - Zong, Han-xing, Vapor heat capacities of some polar-polar binary systems, *Thermochimica Acta.* 352-353 (2000) 19-23.
 doi:10.1016/S0040-6031(99)00431-1

T / K =	402.20
P / bar =	1.013
$cp^M / \text{J.mol}^{-1}.\text{K}^{-1}$	z_1
1.110	0.1929
1.630	0.3508
1.750	0.5020
1.710	0.6505
0.8500	0.7985

HD-HA systems (BAC = 6)



CHLOROFORM (1) + DI-n-PROPYL ETHER (2)

CAS	67-66-3	111-43-3
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	POLCUAVZOMRGSN-UHFFFAOYSA-N
T_c / K	536.40	530.60
P_c / bar	54.72	30.28
ω	0.222	0.369

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -44.49$

$B/\text{MPa} = -136.4$

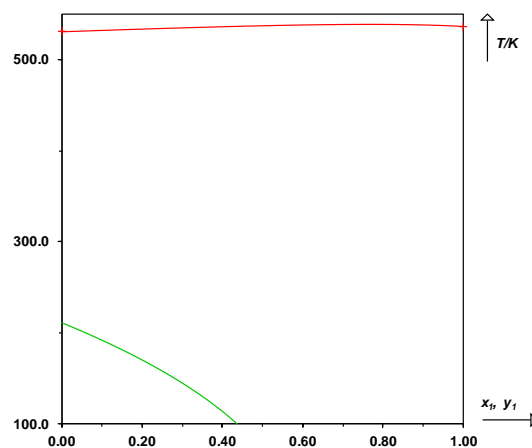
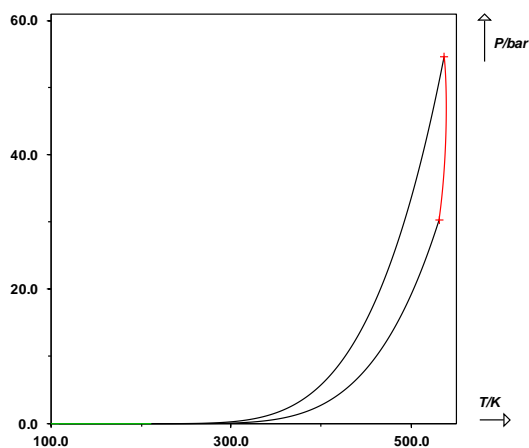
Deviations

MAPE on $x = 18\%$

MAPE on $y = 19\%$

MAPE on $h^M = 18\%$

MAPE on $c_p^M = 34\%$



-----			P / bar =	UNKNOWN (1.0132)
Isobaric phase equilibrium data			$h^M / \text{J.mol}^{-1}$	x_1
-----			-760.00	0.1197
Chevalier, J.L., Systèmes binaires chloroforme-éthers aliphatiques - III. — Équilibres liquide-vapeur, Journal de Chimie Physique et de Physico-Chimie Biologique. 66 (1969) 1457-1466.			-1208.0	0.2145
P / bar =	0.5333		-1549.0	0.3040
T / K	x_1	y_1	-1880.0	0.4120
342.05	0.0510	0.0860	-1942.0	0.5070
340.00	0.1580	0.2460	-1861.0	0.5939
338.05	0.2400	0.3810	-1611.0	0.6909
336.35	0.3050	0.4690	-1199.0	0.7942
335.10	0.3460	0.5290	-669.00	0.8918
333.10	0.4240	0.6200		
329.95	0.5210	0.7300	Becker, F. - Kiefer, M., Heat of mixing and formation of compounds in binary liquid systems. III. Ether-chloroform systems, Z. Naturforsch. Sec. A. 26 (1971) 1040-1046.	
327.70	0.5900	0.7960	T / K =	298.15
325.55	0.6580	0.8530	P / bar =	UNKNOWN (1.0132)
323.10	0.7300	0.9100	$h^M / \text{J.mol}^{-1}$	x_1
321.35	0.7810	0.9390	-164.12	0.0250
319.90	0.8350	0.9600	-323.22	0.0500
			-477.71	0.0750
			-625.51	0.1000
			-770.37	0.1250
			-907.28	0.1500
			-1037.5	0.1750
			-1162.3	0.2000
			-1278.2	0.2250
			-1387.9	0.2500
			-1488.4	0.2750
			-1580.1	0.3000
			-1663.4	0.3250
			-1737.1	0.3500
			-1800.7	0.3750
			-1853.9	0.4000
			-1895.8	0.4250
			-1926.8	0.4500
			-1945.6	0.4750
			-1953.1	0.5000
			-1949.4	0.5250
			-1933.0	0.5500
			-1905.0	0.5750
			-1865.2	0.6000
			-1812.0	0.6250
			-1742.5	0.6500
			-1668.0	0.6750
			-1585.5	0.7000
			-1493.0	0.7250
			-1392.1	0.7500
			-1282.0	0.7750

Enthalpy of mixing				

Beath, L.A. - Williamson, A.G., Thermodynamics of ether solutions I. Enthalpies of mixing of ethers with carbon tetrachloride and with chloroform, The Journal of Chemical Thermodynamics. 1 (1969) 51-57. doi:10.1016/0021-9614(69)90036-6				
T / K =	298.15			

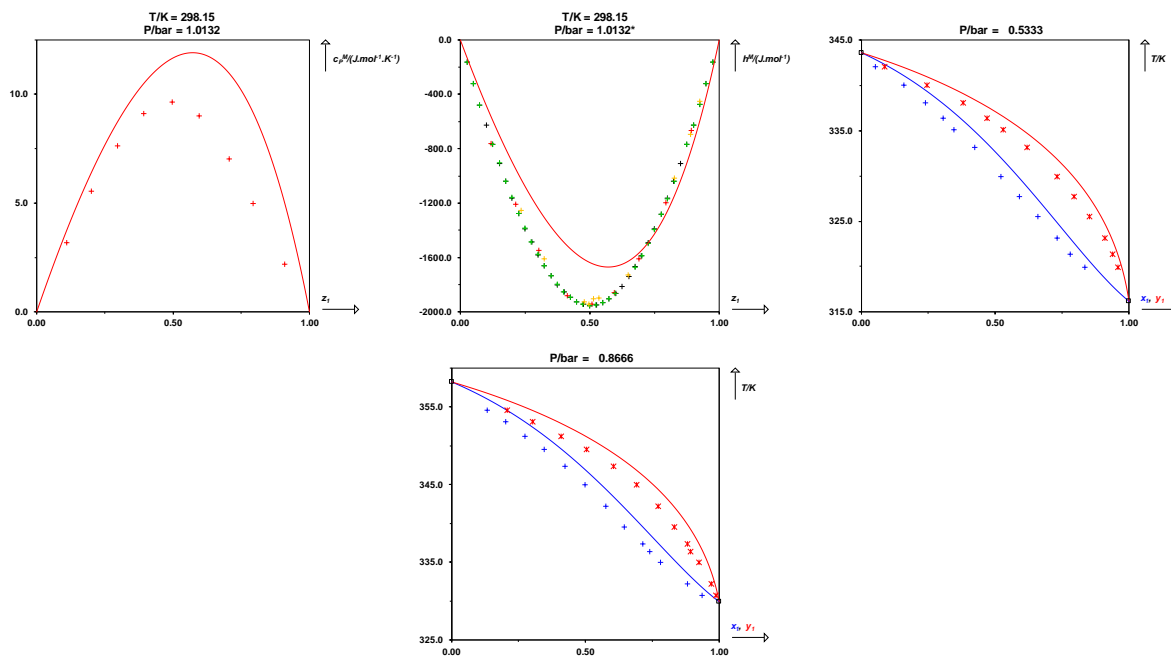
HD-HA systems (BAC = 6)

-1164.3	0.8000	-162.87	0.9750
-1039.2	0.8250		
-906.86	0.8500		
-768.28	0.8750		
-624.25	0.9000		
-475.62	0.9250		
-321.55	0.9500		
-162.87	0.9750		
Becker, F. - Kiefer, M., Kontinuierliche Bestimmung von Mischungswärmen durch isotherme Enthalpietitrations, Zeitschrift für Naturforschung A. 24 (1969) doi:10.1515/zna-1969-0103		Chevalier, Jean-Louis - Bares, Daniel, Systèmes binaires chloroforme-éthers aliphatiques - I. — Chaleurs de mélange à 25 °C, Journal de Chimie Physique. 66 (1969) 1448-1452. doi:10.1051/jcp/196966s21448	
T / K =	298.15	T / K =	298.15
P / bar =	UNKNOWN (1.0132)	P / bar =	UNKNOWN (1.0132)
$h^M / J.mol^{-1}$	x_1	$h^M / J.mol^{-1}$	x_1
-164.12	0.0250	-1256.0	0.2340
-323.22	0.0500	-1611.9	0.3250
-477.30	0.0749	-1925.9	0.4770
-769.12	0.1249	-1942.7	0.4970
-906.02	0.1498	-1905.0	0.5150
-1036.7	0.1748	-1900.8	0.5340
-1160.6	0.1997	-1729.2	0.6470
-1276.6	0.2246	-1017.4	0.8260
-1385.8	0.2495	-695.01	0.8890
-1485.9	0.2744	-452.17	0.9260
-1578.0	0.2994		
-1660.9	0.3243		
-1734.6	0.3492		
-1798.2	0.3740		
-1851.4	0.3989		
-1893.7	0.4238		
-1925.1	0.4487		
-1944.8	0.4736		
-1953.1	0.4986		
-1949.4	0.5236		
-1933.5	0.5486		
-1906.7	0.5736		
-1867.3	0.5968		
-1671.0	0.6759		
-1588.9	0.7009		
-1496.4	0.7258		
-1395.0	0.7507		
-1284.9	0.7756		
-1166.9	0.8005		
-1041.3	0.8254		
-769.95	0.8753		
-625.51	0.9002		
-476.04	0.9251		
-321.55	0.9500		

		Heat capacity of mixing	

Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 217-237.		Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 217-237.	
T / K =	298.15	T / K =	298.15
P / bar =	UNKNOWN (1.0132)	P / bar =	UNKNOWN (1.0132)
$c_p^M / J.mol^{-1}.K^{-1}$	x_1	$c_p^M / J.mol^{-1}.K^{-1}$	x_1
3.160	0.1094	3.160	0.1094
5.560	0.2014	5.560	0.2014
7.620	0.2950	7.620	0.2950
9.130	0.3931	9.130	0.3931
9.630	0.4965	9.630	0.4965
8.990	0.5968	8.990	0.5968
7.030	0.7049	7.030	0.7049
4.990	0.7945	4.990	0.7945
2.190	0.9094	2.190	0.9094

HD-HA systems (BAC = 6)



CHLOROFORM (1) + DIISOPROPYL ETHER (2)

CAS	67-66-3	108-20-3
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	ZAFNJMIOTHYJRJ-UHFFFAOYSA-N
T_c / K	536.40	500.05
P_c / bar	54.72	28.80
ω	0.222	0.339

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -49.79$

$B/\text{MPa} = -161.6$

Deviations

MAPE on $x = 17\%$

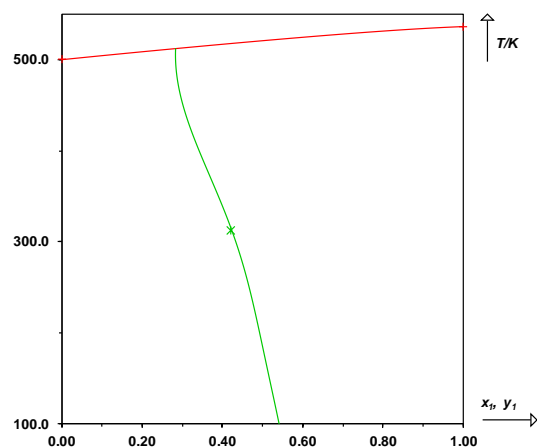
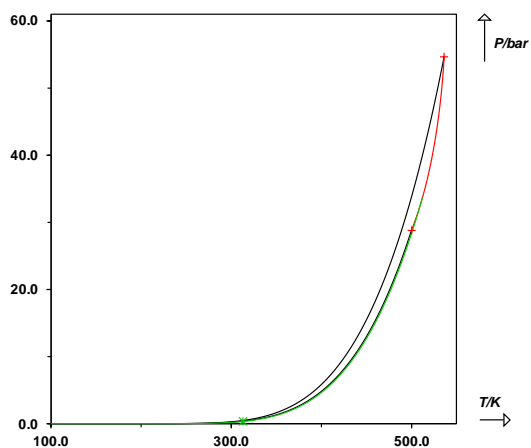
MAPE on $y = 19\%$

MAPE on $x_{az} = 0.74\%$

MAPE on $P_{az} = 0.34\%$

MAPE on $h^M = 35\%$

MAPE on $c_p^M = 20\%$



Isobaric phase equilibrium data

Chevalier, J.L., Systèmes binaires chloroforme-éthers aliphatiques - III. — Équilibres liquide-vapeur, Journal de Chimie Physique et de Physico-Chimie Biologique. 66 (1969) 1457-1466.

P / bar = 0.3280		
T / K	x ₁	y ₁
311.00	0.1300	0.0890
311.25	0.1520	0.1130
311.50	0.1880	0.1410
311.85	0.2280	0.1810
312.25	0.2730	0.2310
312.45	0.3150	0.2750
312.65	0.3700	0.3450
312.80	0.4200	0.4200
312.70	0.4560	0.4690
312.60	0.4800	0.5140
312.15	0.5410	0.6030
311.80	0.5850	0.6550
310.75	0.6400	0.7350
308.65	0.7370	0.8530
307.45	0.7920	0.8980
306.45	0.8390	0.9300
304.40	0.9480	0.9820
303.80	0.9770	0.9930

Chevalier, J.L., Systèmes binaires chloroforme-éthers aliphatiques - III. — Équilibres liquide-vapeur, Journal de Chimie Physique et de Physico-Chimie Biologique. 66 (1969) 1457-1466.

P / bar = 0.7693		
T / K	x ₁	y ₁
333.45	0.1410	0.1000
333.70	0.1720	0.1280
333.95	0.2090	0.1660
334.45	0.2950	0.2650
334.65	0.3730	0.3620
334.40	0.4680	0.4910
333.35	0.5980	0.6620
333.15	0.6120	0.6780
333.05	0.6210	0.6940
332.95	0.6300	0.7050
332.80	0.6430	0.7210
332.65	0.6480	0.7270
332.55	0.6600	0.7400
331.75	0.7030	0.7840
330.60	0.7600	0.8500
329.45	0.8120	0.8970
327.30	0.9310	0.9750

Enthalpy of mixing

Becker, F. - Kiefer, M., Heat of mixing and formation of compounds in binary liquid systems. III. Ether-chloroform systems, Z. Naturforsch. Sec. A. 26 (1971) 1040-1046.

T / K = 298.15		
P / bar = UNKNOWN (1.0132)		
h ^M / J.mol ⁻¹	x ₁	
-237.39	0.0250	
-470.60	0.0500	
-697.10	0.0750	
-917.33	0.1000	
-1130.4	0.1250	
-1336.8	0.1500	
-1539.9	0.1750	
-1724.5	0.2000	
-1904.2	0.2250	
-2077.5	0.2500	
-2229.5	0.2750	
-2373.1	0.3000	
-2504.1	0.3250	
-2619.7	0.3500	
-2719.8	0.3750	
-2803.9	0.4000	
-2870.1	0.4250	
-2917.4	0.4500	
-2945.8	0.4750	
-2955.5	0.5000	
-2945.8	0.5250	
-2916.5	0.5500	
-2868.0	0.5750	
-2800.6	0.6000	
-2716.8	0.6250	
-2608.4	0.6500	
-2467.7	0.6750	
-2322.4	0.7000	
-2173.8	0.7250	
-2014.3	0.7500	
-1844.3	0.7750	
-1665.1	0.8000	
-1477.5	0.8250	
-1281.6	0.8500	
-1080.2	0.8750	
-872.53	0.9000	
-660.68	0.9250	
-444.22	0.9500	
-224.41	0.9750	

Heat capacity of mixing

Fenclova, D. - Dohnal, V. - Perez-Casas, S. - Frigolet, C. - Costas, M., Excess heat capacities, excess enthalpies, and excess volumes of trichloromethane + some oxygenated solvents or + the corresponding homomorphic hydrocarbons at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 217-237.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

4.020	0.1061
7.390	0.1924
11.61	0.3024
14.45	0.3978
15.61	0.4994
14.51	0.5935
11.37	0.7001
7.650	0.7972
3.950	0.8944

Grolier, J. -P. E. - Roux-Desgranges, G. - Berkane, M. - Wilhelm, Emmerich, Heat capacities and densities of mixtures of very polar substances. 3. Mixtures containing either trichloromethane or 1,4-dioxane or diisopropylether, Journal of Solution Chemistry. 23 (1994) 153-166. doi:10.1007/BF00973543

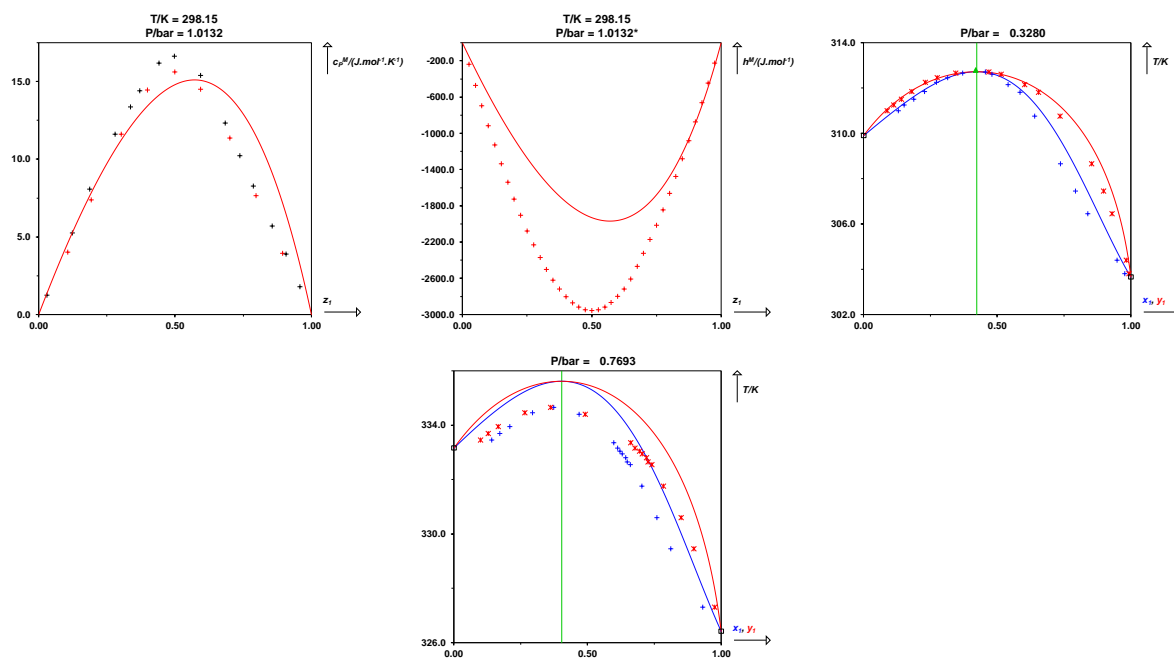
T / K = 298.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

1.246	0.0305
5.259	0.1231
8.067	0.1871
11.60	0.2805
13.37	0.3365
14.41	0.3709
16.19	0.4402
16.63	0.4975
15.40	0.5936
12.32	0.6840
10.23	0.7376
8.280	0.7871
5.689	0.8553
3.902	0.9062
1.796	0.9569

HD-HA systems (BAC = 6)



CHLOROFORM (1) + n-BUTYL ETHYL ETHER (2)

CAS	67-66-3	628-81-9
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	PZHIWRCQKBBTOW-UHFFFAOYSA-N
T_c / K	536.40	531.00
P_c / bar	54.72	29.90
ω	0.222	0.385

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = -38.11

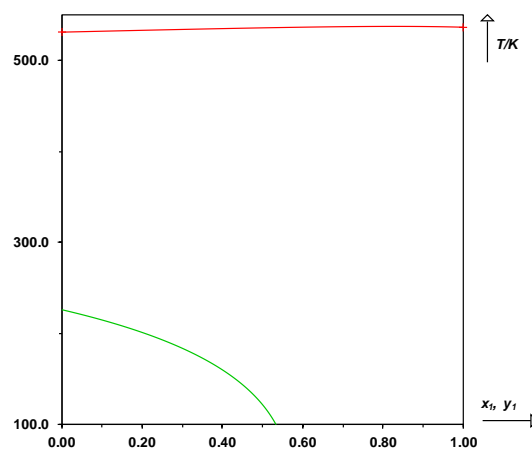
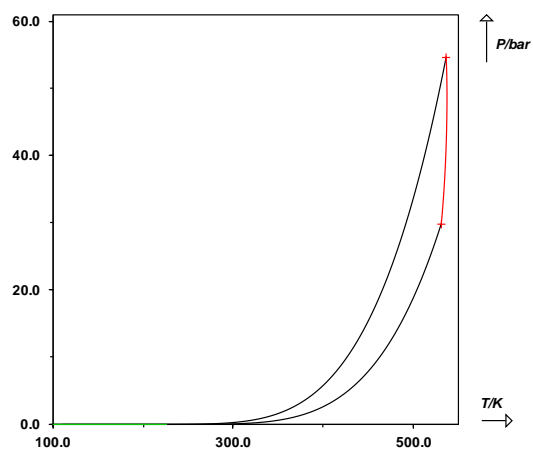
B/MPa = -165.4

Deviations

MAPE on x = 9.2 %

MAPE on y = 8.0 %

MAPE on h^M = 16 %



Isobaric phase equilibrium data

Chevalier, J.L., Systèmes binaires chloroforme-éthers aliphatiques - III. — Équilibres liquide-vapeur, Journal de Chimie Physique et de Physico-Chimie Biologique. 66 (1969) 1457-1466.

P / bar = 0.3333		
T / K	x ₁	y ₁
331.05	0.0800	0.1310
329.95	0.1590	0.2330
327.55	0.2700	0.4060
326.95	0.2950	0.4350
325.75	0.3360	0.5040
323.65	0.4200	0.5950
323.45	0.4210	0.6010
319.65	0.5150	0.7400
316.45	0.5850	0.8150
313.05	0.6690	0.8890
311.65	0.7150	0.9150
309.10	0.7900	0.9470
307.35	0.8450	0.9650
305.50	0.9040	0.9850
304.50	0.9500	0.9910

Chevalier, J.L., Systèmes binaires chloroforme-éthers aliphatiques - III. — Équilibres liquide-vapeur, Journal de Chimie Physique et de Physico-Chimie Biologique. 66 (1969) 1457-1466.

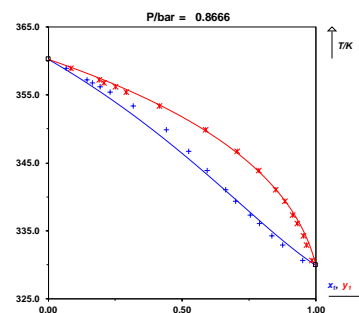
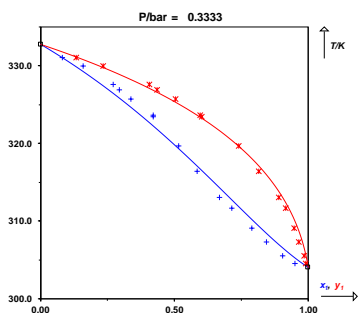
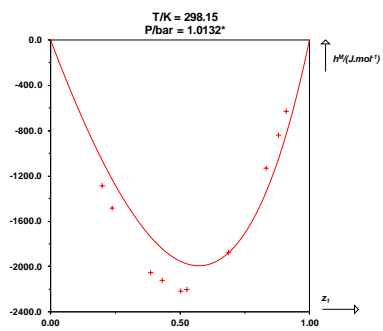
P / bar = 0.8666		
T / K	x ₁	y ₁
358.95	0.0670	0.0840
357.25	0.1450	0.1900
356.80	0.1650	0.2070
356.25	0.1940	0.2500
355.45	0.2300	0.2920
353.35	0.3180	0.4140
349.85	0.4400	0.5870
346.65	0.5250	0.7050
343.85	0.5940	0.7850
341.05	0.6620	0.8500
339.35	0.7000	0.8840
337.35	0.7550	0.9120
336.05	0.7900	0.9300
334.30	0.8350	0.9520
332.95	0.8750	0.9660
330.65	0.9500	0.9850

Enthalpy of mixing

Chevalier, Jean-Louis - Bares, Daniel, Systèmes binaires chloroforme-éthers aliphatiques - I. — Chaleurs de mélange à 25 °C, Journal de Chimie Physique. 66 (1969) 1448-1452. doi:10.1051/jcp/196966s21448

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
-1285.3	0.2000
-1482.1	0.2370
-2051.5	0.3850
-2122.7	0.4300
-2219.0	0.5010
-2206.4	0.5270
-1875.7	0.6880
-1130.4	0.8320
-837.36	0.8810
-632.21	0.9090

HD-HA systems (BAC = 6)



PENTAFLUOROETHANE (1) + DIMETHYL ETHER (2)

CAS	354-33-6	115-10-6
InChiKey	GTLACDSXYULKMZ-UHFFFAOYSA-N	LCGLNKUTAGEVQW-UHFFFAOYSA-N
T_c / K	339.17	400.10
P_c / bar	36.20	53.70
ω	0.305	0.200

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

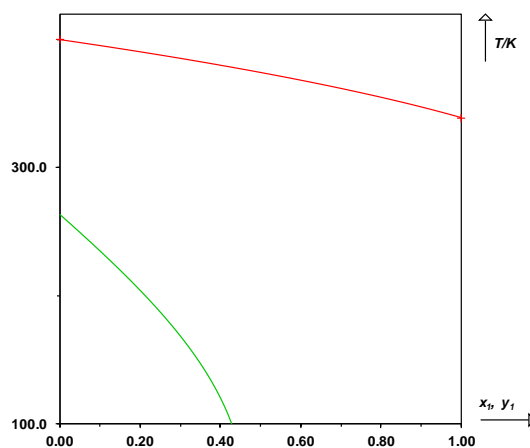
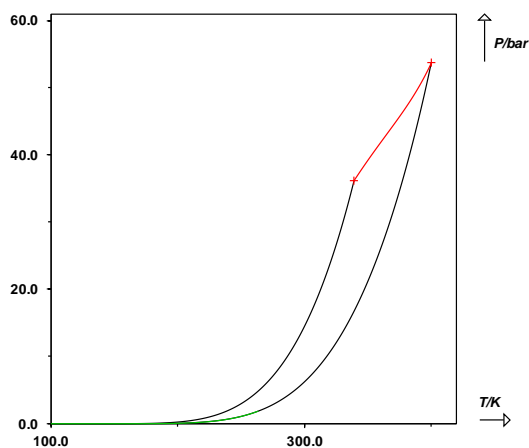
$A/\text{MPa} = -46.33$

$B/\text{MPa} = -160.4$

Deviations

MAPE on $x = 6.9\%$

MAPE on $y = 5.6\%$



Isothermal phase equilibrium data

Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R.,
 Hydrogen-bonding of HFCs with dimethyl ether:
 evaluation by isothermal VLE measurements, Fluid Phase
 Equilibria. 199 (2002) 153-160. doi:10.1016/S0378-
 3812(01)00813-5

T / K = 258.15

P / bar	x ₁	y ₁
1.551	0.0695	0.0813
1.564	0.1153	0.1325
1.581	0.1637	0.1884
1.647	0.2843	0.3440
1.831	0.4280	0.5596
2.213	0.5654	0.7525
2.763	0.7023	0.8834
3.306	0.8220	0.9488
3.595	0.8865	0.9721

Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R.,
 Hydrogen-bonding of HFCs with dimethyl ether:
 evaluation by isothermal VLE measurements, Fluid Phase
 Equilibria. 199 (2002) 153-160. doi:10.1016/S0378-
 3812(01)00813-5

T / K = 273.15

P / bar	x ₁	y ₁
2.760	0.1120	0.1345
2.813	0.1743	0.2094
2.953	0.2927	0.3600
3.323	0.4442	0.5775
3.971	0.5913	0.7660
4.386	0.6578	0.8283
4.947	0.7404	0.8922
5.395	0.8047	0.9299
5.904	0.8776	0.9611
6.420	0.9541	0.9874

Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R.,
 Hydrogen-bonding of HFCs with dimethyl ether:
 evaluation by isothermal VLE measurements, Fluid Phase
 Equilibria. 199 (2002) 153-160. doi:10.1016/S0378-
 3812(01)00813-5

T / K = 288.15

P / bar	x ₁	y ₁
4.475	0.0585	0.0750
4.868	0.2668	0.3337
5.233	0.3815	0.4845
5.850	0.5007	0.6386
6.415	0.5795	0.7321
7.216	0.6716	0.8231
7.672	0.7184	0.8599

8.382	0.7911	0.9077
9.369	0.8874	0.9568
9.920	0.9398	0.9786

Bobbo, S. - Fedele, L. - Camporese, R. - Stryjek, R.,
 Hydrogen-bonding of HFCs with dimethyl ether:
 evaluation by isothermal VLE measurements, Fluid Phase
 Equilibria. 199 (2002) 153-160. doi:10.1016/S0378-
 3812(01)00813-5

T / K = 303.15

P / bar	x ₁	y ₁
6.960	0.0519	0.0695
7.523	0.2277	0.2867
8.453	0.4116	0.5162
9.825	0.5680	0.6987
11.07	0.6721	0.8025
11.14	0.6805	0.8103
12.28	0.7677	0.8756
13.21	0.8331	0.9177
14.17	0.8967	0.9526

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim,
 Hwayong, (Vapour+liquid) equilibria of the
 {pentafluoroethane (HFC-125)+dimethyl ether (DME)}
 system, The Journal of Chemical Thermodynamics. 38
 (2006) 1510-1514. doi:10.1016/j.jct.2006.04.009

T / K = 313.15

P / bar	x ₁	y ₁
9.240	0.0831	0.1080
9.680	0.1790	0.2130
10.00	0.2430	0.2933
10.70	0.3558	0.4355
11.82	0.4807	0.5890
14.06	0.6569	0.7723
15.23	0.7298	0.8352
16.51	0.8050	0.8903
17.95	0.8849	0.9393
18.94	0.9391	0.9689

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim,
 Hwayong, (Vapour+liquid) equilibria of the
 {pentafluoroethane (HFC-125)+dimethyl ether (DME)}
 system, The Journal of Chemical Thermodynamics. 38
 (2006) 1510-1514. doi:10.1016/j.jct.2006.04.009

T / K = 323.15

P / bar	x ₁	y ₁
11.96	0.0869	0.1131
12.38	0.1560	0.1951
12.77	0.2146	0.2679
13.26	0.2797	0.3469
13.64	0.3261	0.4036
14.46	0.4079	0.5046

HD-HA systems (BAC = 6)

15.58	0.5040	0.6048
16.88	0.5920	0.6968
18.69	0.6944	0.7956
20.20	0.7688	0.8554
22.75	0.8863	0.9347

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, (Vapour+liquid) equilibria of the {pentafluoroethane (HFC-125)+dimethyl ether (DME)} system, The Journal of Chemical Thermodynamics. 38 (2006) 1510-1514. doi:10.1016/j.jct.2006.04.009

T / K = 333.15

P / bar	x ₁	y ₁
14.90	0.0432	0.0580
15.33	0.0960	0.1262
15.66	0.1374	0.1748
16.26	0.2116	0.2616
16.93	0.2808	0.3408
17.66	0.3501	0.4244
19.99	0.5153	0.6089
21.29	0.5882	0.6816
22.89	0.6624	0.7508
24.91	0.7507	0.8271
26.74	0.8241	0.8796
28.49	0.8871	0.9255

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, (Vapour+liquid) equilibria of the {pentafluoroethane (HFC-125)+dimethyl ether (DME)} system, The Journal of Chemical Thermodynamics. 38 (2006) 1510-1514. doi:10.1016/j.jct.2006.04.009

T / K = 343.15

P / bar	x ₁	y ₁
18.50	0.0304	0.0423
19.48	0.1222	0.1565
20.04	0.1753	0.2193
20.70	0.2373	0.2934
21.55	0.2986	0.3702
22.75	0.3882	0.4611
24.37	0.4790	0.5655
25.57	0.5411	0.6224
26.69	0.5977	0.6729
29.04	0.6889	0.7537
31.44	0.7680	0.8220
33.44	0.8378	0.8701
35.94	0.9119	0.9218
36.30	0.9224	0.9285
36.40	0.9274	0.9296

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, (Vapour+liquid) equilibria of the

{pentafluoroethane (HFC-125)+dimethyl ether (DME)} system, The Journal of Chemical Thermodynamics. 38 (2006) 1510-1514. doi:10.1016/j.jct.2006.04.009

T / K = 353.15

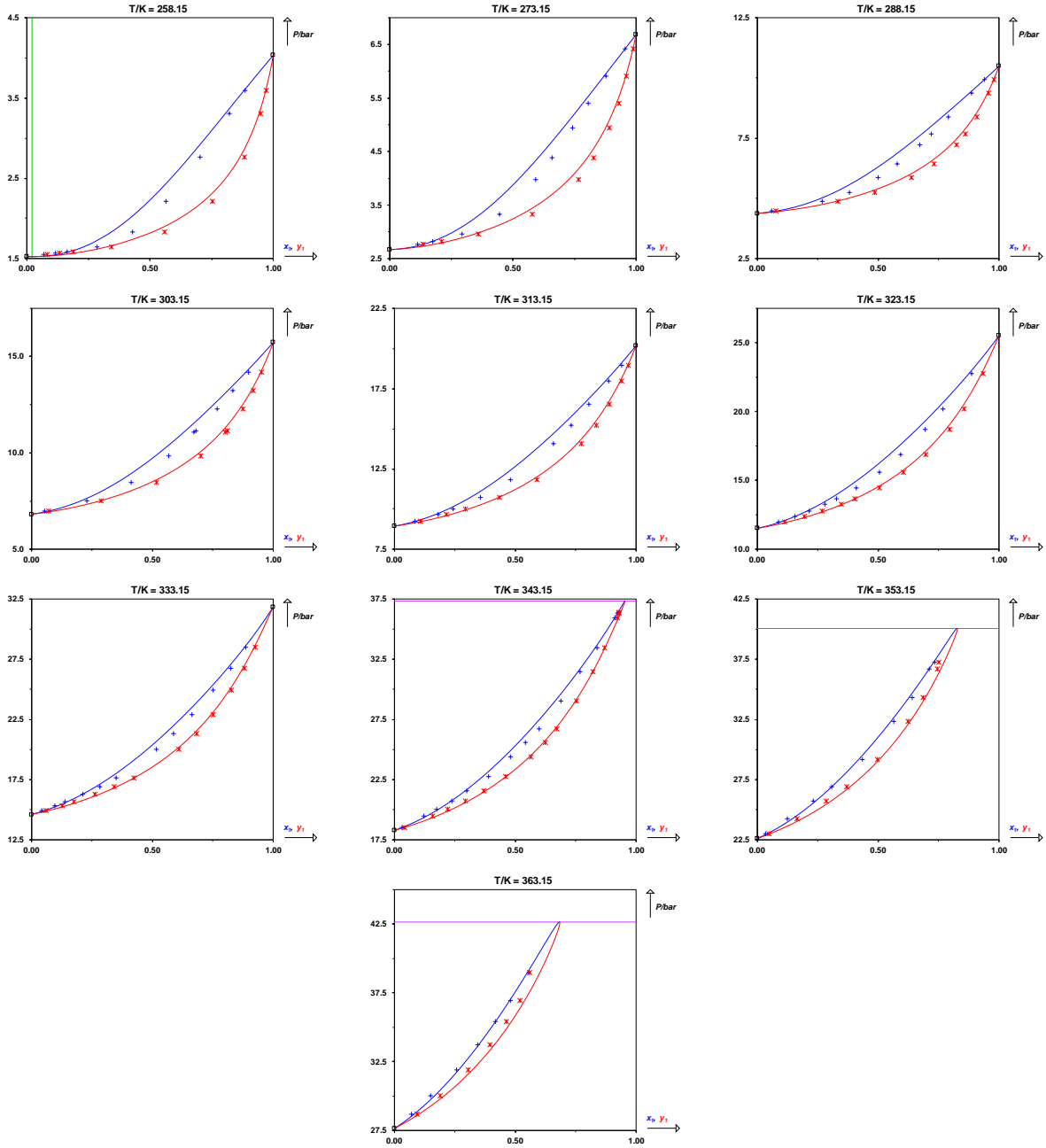
P / bar	x ₁	y ₁
23.02	0.0338	0.0490
24.25	0.1229	0.1639
25.73	0.2312	0.2860
26.90	0.3076	0.3682
29.18	0.4351	0.4968
32.31	0.5652	0.6248
34.31	0.6411	0.6864
36.69	0.7114	0.7441
37.24	0.7352	0.7510

Im, Jihoon - Lee, Gangwon - Lee, Jongcheon - Kim, Hwayong, (Vapour+liquid) equilibria of the {pentafluoroethane (HFC-125)+dimethyl ether (DME)} system, The Journal of Chemical Thermodynamics. 38 (2006) 1510-1514. doi:10.1016/j.jct.2006.04.009

T / K = 363.15

P / bar	x ₁	y ₁
28.67	0.0705	0.0939
30.03	0.1490	0.1887
31.91	0.2561	0.3051
33.72	0.3436	0.3949
35.40	0.4174	0.4634
36.95	0.4785	0.5183
38.97	0.5548	0.5575

HD-HA systems (BAC = 6)



ETHYL ACETATE (1) + TRICHLOROETHYLENE (2)

CAS	141-78-6	79-01-6
InChiKey	XEKOWRVHYACXOJ-UHFFFAOYSA-N	XSTXAVWGXDKEL-UHFFFAOYSA-N
T_c / K	523.30	571.00
P_c / bar	38.80	49.10
ω	0.366	0.217

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

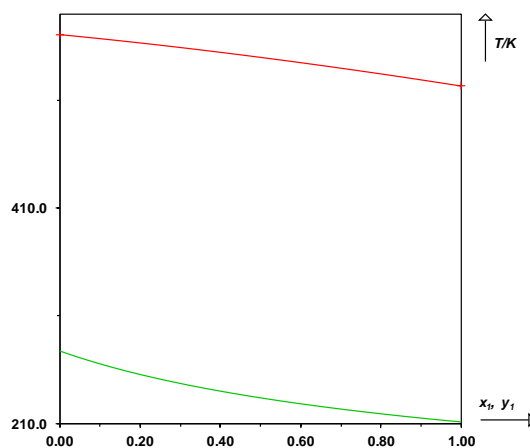
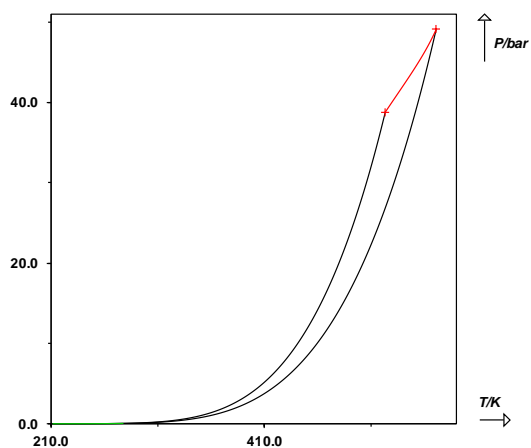
$A/\text{MPa} = -7.397$

$B/\text{MPa} = 0.709$

Deviations

MAPE on $x = 8.8\%$

MAPE on $y = 9.6\%$



-----			P / bar =	0.9333
Isothermal phase equilibrium data			T / K	x ₁ y ₁
-----			357.45	0.0230 0.0270
Rao, M. Raja - Rao, K. V. Kurmanadha - Rao, C. Venkata, Vapour-liquid equilibria of ethyl acetate- trichloroethylene system, Journal of Applied Chemistry. 7 (1957) 666-671. doi:10.1002/jctb.5010071205 T / K = 333.15 P / bar x ₁ y ₁ 0.4226 0.0230 0.0250 0.4240 0.0430 0.0550 0.4280 0.0830 0.0980 0.4346 0.1450 0.1800 0.4453 0.2350 0.2950 0.4826 0.5190 0.5980 0.5000 0.6250 0.7030 0.5213 0.7650 0.8200 0.5306 0.8230 0.8580 0.5400 0.8730 0.9050 0.5440 0.9000 0.9300 0.5520 0.9430 0.9680 0.5560 0.9680 0.9800			357.35	0.0430 0.0630
			356.95	0.0830 0.1080
			352.55	0.5190 0.6100
			350.05	0.7650 0.8300
			349.35	0.8230 0.8750
			348.85	0.8730 0.9080
			348.55	0.9000 0.9350
			347.75	0.9680 0.9800

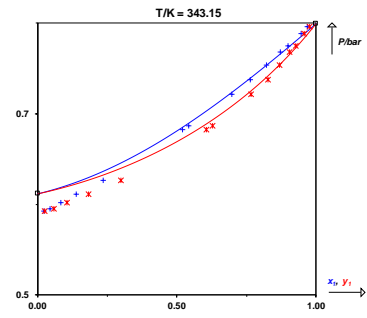
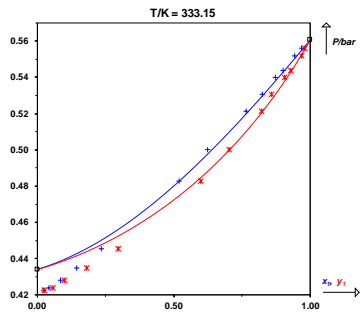
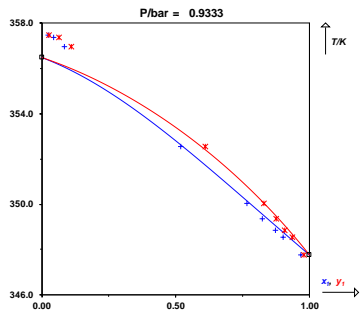
Rao, M. Raja - Rao, K. V. Kurmanadha - Rao, C. Venkata,
 Vapour-liquid equilibria of ethyl acetate-
 trichloroethylene system, Journal of Applied Chemistry. 7
 (1957) 666-671. doi:10.1002/jctb.5010071205

-----			T / K =	343.15
P / bar	x ₁	y ₁		
0.5920	0.0230	0.0250		
0.5946	0.0430	0.0580		
0.6013	0.0830	0.1050		
0.6106	0.1380	0.1820		
0.6266	0.2350	0.2980		
0.6826	0.5190	0.6050		
0.6866	0.5430	0.6280		
0.7213	0.6980	0.7680		
0.7373	0.7650	0.8280		
0.7533	0.8230	0.8680		
0.7679	0.8730	0.9050		
0.7746	0.9000	0.9270		
0.7879	0.9460	0.9580		
0.7959	0.9680	0.9780		

Isobaric phase equilibrium data

Rao, M. Raja - Rao, K. V. Kurmanadha - Rao, C. Venkata,
 Vapour-liquid equilibria of ethyl acetate-
 trichloroethylene system, Journal of Applied Chemistry. 7
 (1957) 666-671. doi:10.1002/jctb.5010071205

HD-HA systems (BAC = 6)



DIMETHYL ETHER (1) + 1,1,1,3,3,3-HEXAFLUOROPROPANE (2)

CAS	115-10-6	690-39-1
InChiKey	LCGLNKUTAGEVQW-UHFFFAOYSA-N	NSGXIBWMJZWTPY-UHFFFAOYSA-N
T_c / K	400.10	398.07
P_c / bar	53.70	32.19
ω	0.200	0.390

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

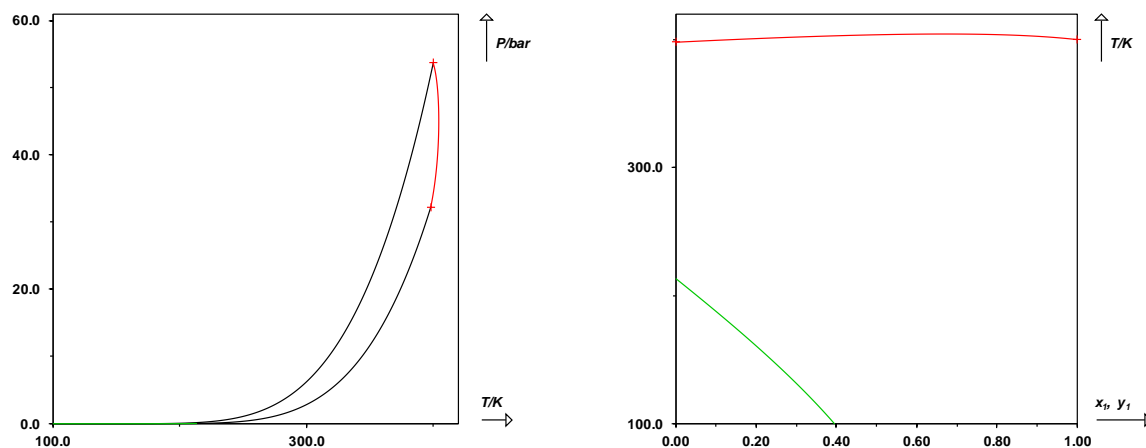
A/MPa = -46.96

B/MPa = -140.1

Deviations

MAPE on x = 3.3 %

MAPE on y = 4.3 %



Isothermal phase equilibrium data				

		7.130	0.4557	0.5631
		7.574	0.5348	0.6534
		7.916	0.5864	0.7116
		8.602	0.6754	0.7980
		9.276	0.7527	0.8606
		10.07	0.8371	0.9175
		10.55	0.8860	0.9458
Bobbo, Sergio - Fedele, Laura - Camporese, Roberto - Stryjek, Roman, Isothermal vapor–liquid equilibrium for the three binary systems 1,1,1,2,3,3-hexafluoropropane with dimethyl ether or propane, and 1,1,1,3,3,3-hexafluoropropane with dimethyl ether, Fluid Phase Equilibria. 174 (2000) 3-12. doi:10.1016/S0378-3812(00)00413-1				
T / K = 283.12				
P / bar	x ₁	y ₁		
1.620	0.1319	0.1480		
1.642	0.1921	0.2265		
1.710	0.2908	0.3617		
2.831	0.7583	0.9073		
3.225	0.8588	0.9594		
3.600	0.9645	0.9918		

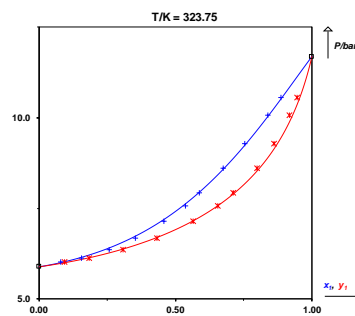
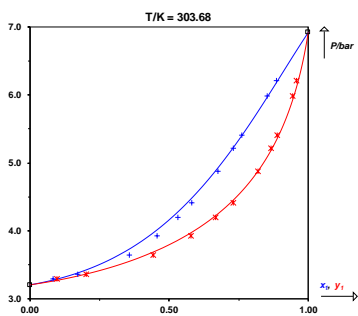
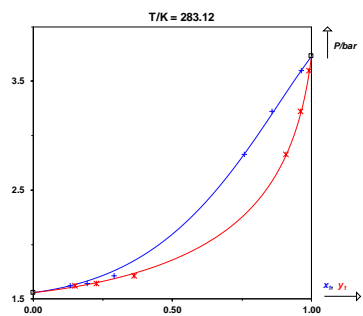
Bobbo, Sergio - Camporese, Roberto - Stryjek, Roman, (Vapour + liquid) equilibrium measurements and correlations of the refrigerant mixture {dimethyl ether (RE170) + 1,1,1,3,3,3-hexafluoropropane (R236fa)} at the temperatures (303.68 and 323.75) K, The Journal of Chemical Thermodynamics. 30 (1998) 1041-1046. doi:10.1006/jcht.1998.0369

T / K = 303.68				
P / bar	x ₁	y ₁		
3.296	0.0829	0.0970		
3.364	0.1708	0.2016		
3.649	0.3558	0.4428		
3.925	0.4553	0.5774		
4.195	0.5315	0.6664		
4.418	0.5820	0.7298		
4.881	0.6743	0.8184		
5.218	0.7305	0.8656		
5.409	0.7624	0.8877		
5.986	0.8517	0.9426		
6.207	0.8859	0.9588		

Bobbo, Sergio - Camporese, Roberto - Stryjek, Roman, (Vapour + liquid) equilibrium measurements and correlations of the refrigerant mixture {dimethyl ether (RE170) + 1,1,1,3,3,3-hexafluoropropane (R236fa)} at the temperatures (303.68 and 323.75) K, The Journal of Chemical Thermodynamics. 30 (1998) 1041-1046. doi:10.1006/jcht.1998.0369

T / K = 323.75				
P / bar	x ₁	y ₁		
6.013	0.0779	0.0922		
6.132	0.1563	0.1830		
6.357	0.2557	0.3087		
6.672	0.3533	0.4322		

HD-HA systems (BAC = 6)



3-PENTANONE (1) + 1,1,2,2-TETRACHLOROETHANE (2)

CAS	96-22-0	79-34-5
InChiKey	FDPIMTJIUBPUKL-UHFFFAOYSA-N	QPFMBZIOSGYJDE-UHFFFAOYSA-N
T_c / K	560.95	645.00
P_c / bar	37.40	40.90
ω	0.345	0.247

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

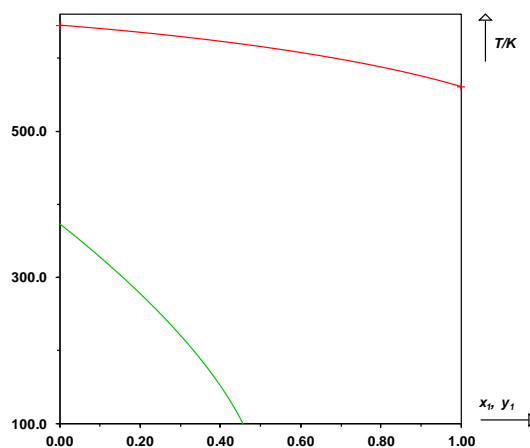
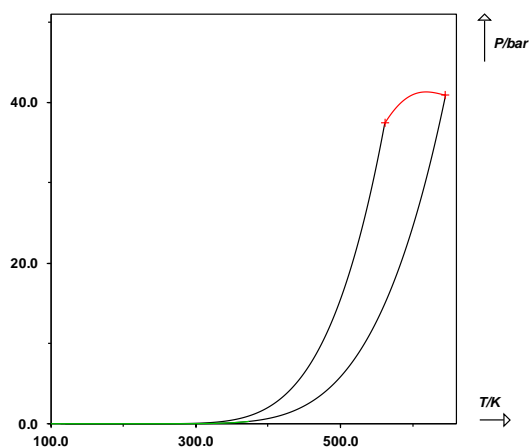
A/MPa = -96.52

B/MPa = -223.4

Deviations

MAPE on x = 4.7 %

MAPE on y = 8.7 %



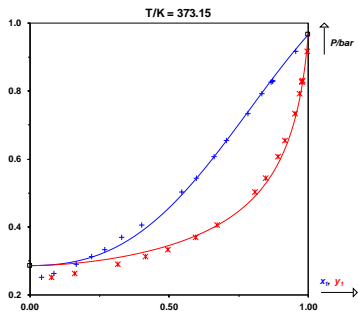
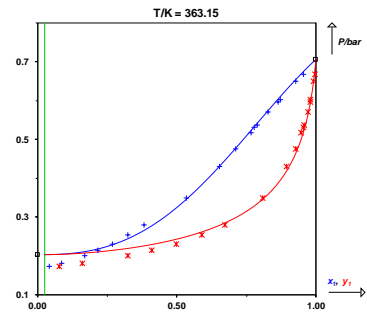
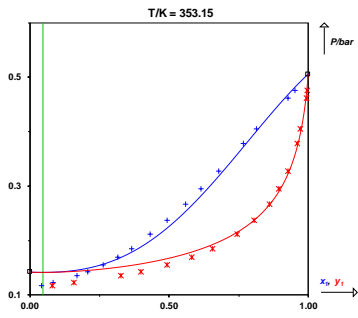
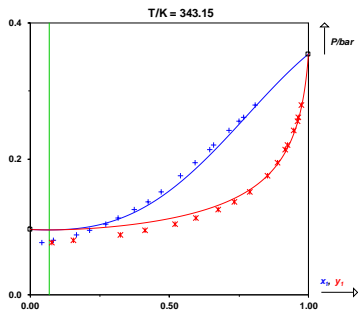
-----			0.4618	0.9285	0.9927
Isothermal phase equilibrium data			0.4755	0.9524	0.9963

Teodorescu, Mariana - Aim, Karel - Wichterle, Ivan, Isothermal vapour–liquid equilibria for pentan-3-one+1,4- dichlorobutane, +trichloromethane, +1,1,1- trichloroethane, +1,1,2,2-tetrachloroethane binary mixtures, Fluid Phase Equilibria. 147 (1998) 215-228. doi:10.1016/S0378-3812(98)00235-0			Teodorescu, Mariana - Aim, Karel - Wichterle, Ivan, Isothermal vapour–liquid equilibria for pentan-3-one+1,4- dichlorobutane, +trichloromethane, +1,1,1- trichloroethane, +1,1,2,2-tetrachloroethane binary mixtures, Fluid Phase Equilibria. 147 (1998) 215-228. doi:10.1016/S0378-3812(98)00235-0		
T / K = 343.15			T / K = 363.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.0765	0.0399	0.0767	0.1736	0.0399	0.0777
0.0796	0.0819	0.1551	0.1816	0.0840	0.1593
0.0885	0.1666	0.3231	0.2014	0.1687	0.3231
0.0945	0.2122	0.4109	0.2149	0.2164	0.4099
0.1044	0.2710	0.5200	0.2313	0.2669	0.4974
0.1131	0.3160	0.5949	0.2543	0.3231	0.5882
0.1258	0.3728	0.6765	0.2804	0.3808	0.6717
0.1372	0.4220	0.7324	0.3500	0.5337	0.8074
0.1512	0.4707	0.7878	0.4300	0.6536	0.8954
0.1752	0.5405	0.8520	0.4758	0.7125	0.9267
0.1943	0.5920	0.8889	0.5173	0.7662	0.9469
0.2139	0.6459	0.9166	0.5318	0.7784	0.9552
0.2204	0.6593	0.9258	0.5368	0.7896	0.9570
0.2418	0.7135	0.9460	0.5711	0.8278	0.9716
0.2558	0.7512	0.9597	0.5972	0.8631	0.9799
0.2616	0.7653	0.9643	0.6018	0.8705	0.9808
0.2790	0.8083	0.9744	0.6493	0.9285	0.9918
			0.6676	0.9552	0.9963
Teodorescu, Mariana - Aim, Karel - Wichterle, Ivan, Isothermal vapour–liquid equilibria for pentan-3-one+1,4- dichlorobutane, +trichloromethane, +1,1,1- trichloroethane, +1,1,2,2-tetrachloroethane binary mixtures, Fluid Phase Equilibria. 147 (1998) 215-228. doi:10.1016/S0378-3812(98)00235-0			Teodorescu, Mariana - Aim, Karel - Wichterle, Ivan, Isothermal vapour–liquid equilibria for pentan-3-one+1,4- dichlorobutane, +trichloromethane, +1,1,1- trichloroethane, +1,1,2,2-tetrachloroethane binary mixtures, Fluid Phase Equilibria. 147 (1998) 215-228. doi:10.1016/S0378-3812(98)00235-0		
T / K = 353.15			T / K = 373.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.1170	0.0399	0.0788	0.2513	0.0399	0.0767
0.1218	0.0819	0.1562	0.2626	0.0840	0.1603
0.1357	0.1676	0.3262	0.2894	0.1655	0.3139
0.1428	0.2081	0.3979	0.3123	0.2212	0.4160
0.1554	0.2618	0.4924	0.3337	0.2689	0.4954
0.1698	0.3139	0.5814	0.3694	0.3302	0.5940
0.1854	0.3657	0.6555	0.4051	0.4009	0.6736
0.2121	0.4329	0.7456	0.5021	0.5464	0.8083
0.2369	0.4914	0.8055	0.5444	0.5978	0.8473
0.2672	0.5581	0.8612	0.6073	0.6603	0.8908
0.2949	0.6133	0.8954	0.6537	0.7050	0.9175
0.3280	0.6774	0.9267	0.7344	0.7821	0.9515
0.3783	0.7653	0.9616	0.7919	0.8325	0.9689
0.4049	0.8148	0.9726			

HD-HA systems (BAC = 6)

0.8268	0.8659	0.9762
0.8292	0.8705	0.9780
0.8310	0.8723	0.9790
0.9171	0.9561	0.9954

HD-HA systems (BAC = 6)



CYCLOPENTANONE (1) + 1,1,2,2-TETRACHLOROETHANE (2)

CAS	120-92-3	79-34-5
InChiKey	BGTOWKSIORTVQH-UHFFFAOYSA-N	QPFMBZIOSGYJDE-UHFFFAOYSA-N
T_c / K	624.50	645.00
P_c / bar	46.00	40.90
ω	0.288	0.247

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -104.1$

$B/\text{MPa} = -176.6$

Deviations

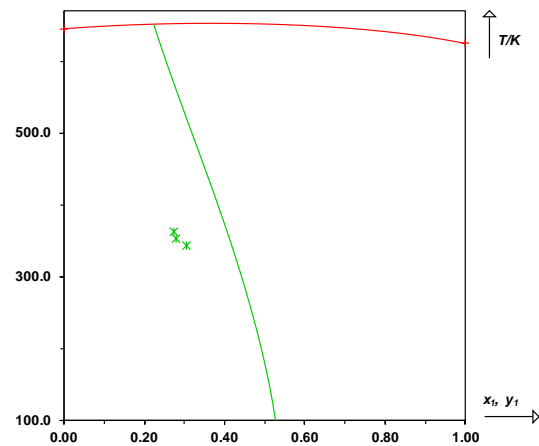
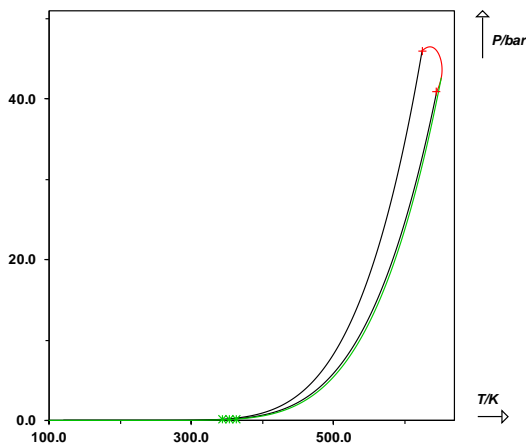
MAPE on $x = 15\%$

MAPE on $y = 14\%$

MAPE on $x_{az} = 31\%$

MAPE on $P_{az} = 8.9\%$

MAPE on $h^M = 8.9\%$



Isothermal phase equilibrium data				0.1626 0.8520 0.9568		
-----				0.1772	0.9194	0.9832
-----				0.1888	0.9658	0.9951
Teodorescu, Mariana - Barhala, Alexandru - Dragoescu, Dana, Isothermal (vapour+liquid) equilibria for the binary (cyclopentanone or cyclohexanone with 1,1,2,2-tetrachloroethane) systems at temperatures of (343.15, 353.15, and 363.15)K, The Journal of Chemical Thermodynamics. 38 (2006) 1432-1437. doi:10.1016/j.jct.2006.01.010				Teodorescu, Mariana - Barhala, Alexandru - Dragoescu, Dana, Isothermal (vapour+liquid) equilibria for the binary (cyclopentanone or cyclohexanone with 1,1,2,2-tetrachloroethane) systems at temperatures of (343.15, 353.15, and 363.15)K, The Journal of Chemical Thermodynamics. 38 (2006) 1432-1437. doi:10.1016/j.jct.2006.01.010		
T / K = 343.15				T / K = 363.15		
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁
0.0717	0.0648	0.0497		0.1613	0.0623	0.0522
0.0697	0.1045	0.0748		0.1574	0.1144	0.0897
0.0675	0.1580	0.1266		0.1560	0.1556	0.1314
0.0663	0.2169	0.1889		0.1538	0.2169	0.1959
0.0656	0.2763	0.2718		0.1536	0.2741	0.2853
0.0654	0.3038	0.3038	AZEO	0.1527	0.2746	0.2746 AZEO
0.0664	0.3402	0.3892		0.1553	0.3440	0.3912
0.0679	0.4222	0.5284		0.1597	0.4243	0.5208
0.0708	0.4803	0.6260		0.1658	0.4803	0.6225
0.0752	0.5527	0.7244		0.1762	0.5527	0.7244
0.0816	0.6260	0.8093		0.1880	0.6260	0.8079
0.0880	0.6960	0.8796		0.2016	0.6927	0.8659
0.0972	0.7695	0.9312		0.2221	0.7783	0.9249
0.1073	0.8507	0.9648		0.2409	0.8520	0.9588
0.1185	0.9149	0.9851		0.2609	0.9149	0.9832
0.1256	0.9658	0.9960		0.2781	0.9658	0.9951
0.1283	0.9841	0.9969		0.2840	0.9841	0.9969
-----				-----		
Teodorescu, Mariana - Barhala, Alexandru - Dragoescu, Dana, Isothermal (vapour+liquid) equilibria for the binary (cyclopentanone or cyclohexanone with 1,1,2,2-tetrachloroethane) systems at temperatures of (343.15, 353.15, and 363.15)K, The Journal of Chemical Thermodynamics. 38 (2006) 1432-1437. doi:10.1016/j.jct.2006.01.010				Pathak, Gopal - Tripathi, A.D. - Phalgune, U.D. - Pradhan, S.D., Enthalpies of mixing of tetrachloroethane with furan, methylfuran, tetrahydrofuran, cyclopentanone and 1,4-dioxane, Thermochimica Acta. 258 (1995) 109-115. doi:10.1016/0040-6031(94)02236-H		
T / K = 353.15				T / K = 303.15		
P / bar	x ₁	y ₁		P / bar = UNKNOWN (1.0132)		
0.1067	0.0623	0.0497		h ^M / J.mol ⁻¹	x ₁	
0.1040	0.1144	0.0848		-657.00	0.0697	
0.1032	0.1580	0.1266		-1668.0	0.2000	
0.1017	0.2169	0.1959		-2188.0	0.2819	
0.1018	0.2741	0.2786		-2784.0	0.4375	
0.1007	0.2806	0.2806	AZEO	-2767.0	0.5566	
0.1023	0.3446	0.3892		-2681.0	0.6132	
0.1049	0.4222	0.5284		-2360.0	0.6888	
0.1092	0.4842	0.6225		-1659.0	0.7979	
0.1169	0.5582	0.7244		-1084.0	0.8685	
0.1253	0.6260	0.8107				
0.1344	0.6943	0.8709				
0.1478	0.7753	0.9238				

-796.00	0.9086
-420.00	0.9518

Chadha, Renu - Tripathi, Atri D., Excess Molar Enthalpies of 1,1,2,2-Tetrachloroethane + 2-Methylfuran, + Tetrahydrofuran, + 1,4-Dioxane, and + Cyclopentanone at 308.15 and 318.15 K, Journal of Chemical & Engineering Data. 40 (1995) 645-646. doi:10.1021/je00019a024

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
-616.00	0.0697
-1675.0	0.2000
-2205.0	0.2819
-2785.0	0.4375
-2788.0	0.5566
-2652.0	0.6132
-2341.0	0.6888
-1666.0	0.7979
-1121.0	0.8685
-787.00	0.9086
-416.00	0.9518

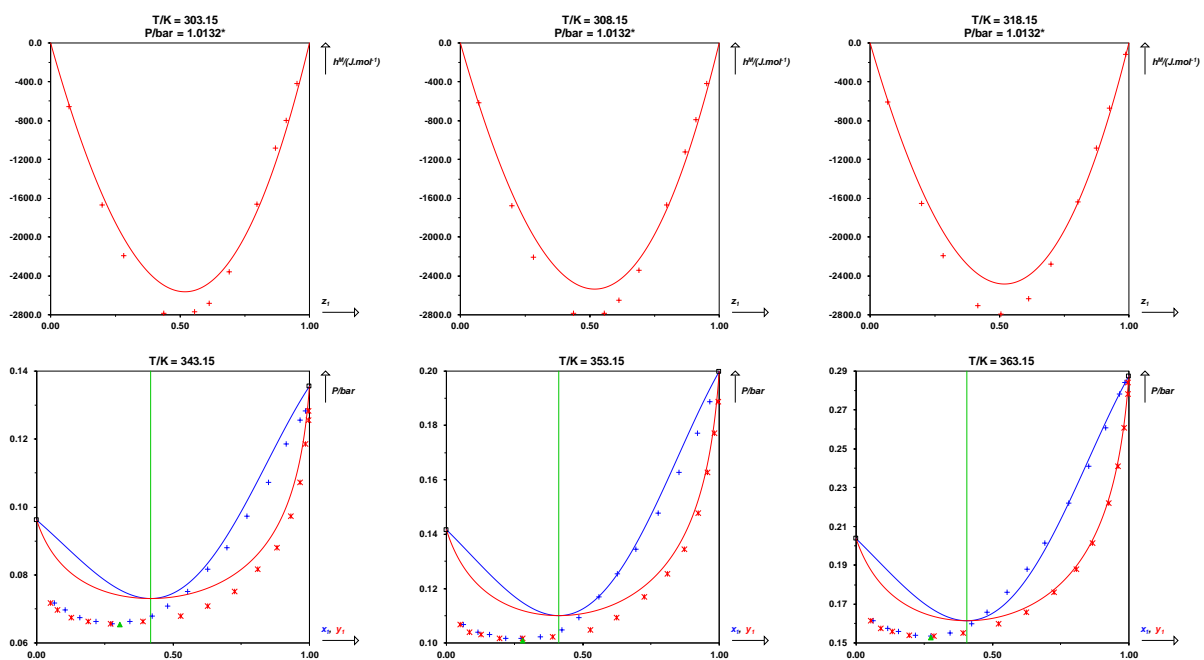
Chadha, Renu - Tripathi, Atri D., Excess Molar Enthalpies of 1,1,2,2-Tetrachloroethane + 2-Methylfuran, + Tetrahydrofuran, + 1,4-Dioxane, and + Cyclopentanone at 308.15 and 318.15 K, Journal of Chemical & Engineering Data. 40 (1995) 645-646. doi:10.1021/je00019a024

T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
-607.00	0.0682
-1654.0	0.1986
-2189.0	0.2835
-2705.0	0.4167
-2796.0	0.5045
-2631.0	0.6112
-2275.0	0.6995
-1641.0	0.8025
-1082.0	0.8752
-675.00	0.9235
-119.00	0.9867

HD-HA systems (BAC = 6)



ETHYL ACETATE (1) + 1,1,2,2-TETRACHLOROETHANE (2)

CAS	141-78-6	79-34-5
InChiKey	XEKOWRVHYACXOJ-UHFFFAOYSA-N	QPFMBZIOSGYJDE-UHFFFAOYSA-N
T_c / K	523.30	645.00
P_c / bar	38.80	40.90
ω	0.366	0.247

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = -75.71

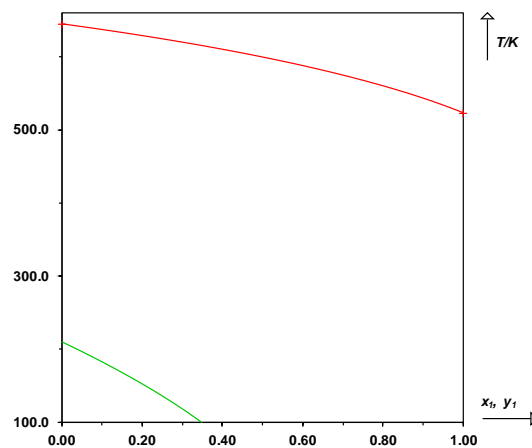
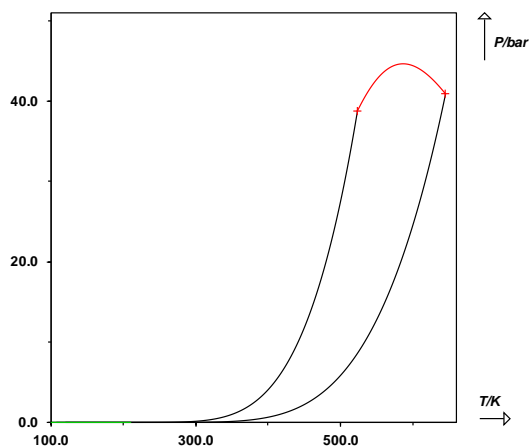
B/MPa = -161.7

Deviations

MAPE on x = 2.1 %

MAPE on y = 9.8 %

MAPE on h^M = 11 %



-----			-1993.1	0.6835
Isothermal phase equilibrium data			-1768.1	0.7245
-----			-1486.1	0.7699
Farkova, J. - Wichterle, I., Vapor-liquid equilibria of 1, 1, 2, 2-tetrachloroethane + some n-alkyl n-alkanoates, ELDATA Int. Electron. J. Phys.-Chem. Data. 1 (1995) 13-22.			-1150.6	0.8213
T / K = 330.00			-768.60	0.8800
P / bar	x ₁	y ₁	-407.40	0.9406
0.1738	0.4516	0.8954		
0.1912	0.4826	0.9108		
0.2255	0.5469	0.9385		
0.3281	0.7060	0.9690		
0.3592	0.7529	0.9827		
0.4165	0.8510	0.9907		
0.4633	0.9371	0.9978		
0.4707	0.9458	0.9964		

Farkova, J. - Wichterle, I., Vapor-liquid equilibria of 1, 1, 2, 2-tetrachloroethane + some n-alkyl n-alkanoates, ELDATA Int. Electron. J. Phys.-Chem. Data. 1 (1995) 13-22.

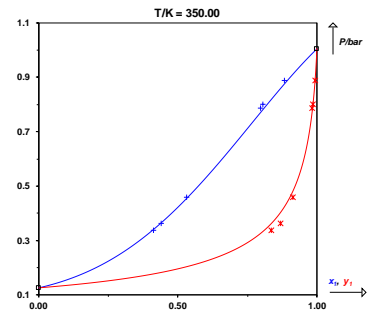
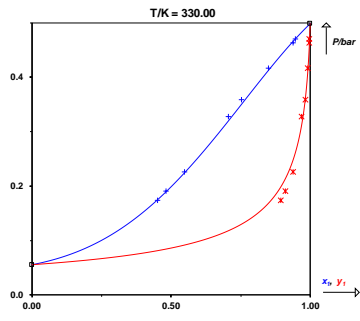
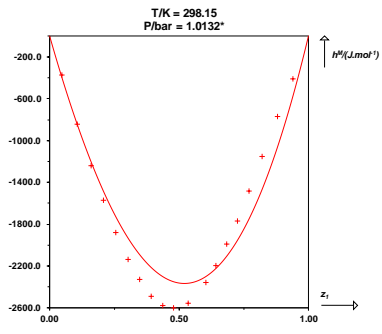
T / K = 350.00		
P / bar	x ₁	y ₁
0.3379	0.4118	0.8361
0.3639	0.4389	0.8688
0.4588	0.5321	0.9130
0.7853	0.7978	0.9834
0.8015	0.8053	0.9856
0.8889	0.8836	0.9928

Enthalpy of mixing

Ortega, J., Excess enthalpies of 1, 1, 2, 2-tetrachloroethane+ some alkyl alkanoates (C3-C7), Int. DATA Ser., Sel. Data Mixtures, Ser. A. 19 (1991) 247-254.

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
-377.10	0.0459
-843.10	0.1063
-1239.1	0.1586
-1570.7	0.2066
-1880.2	0.2558
-2134.6	0.3032
-2326.8	0.3480
-2488.4	0.3929
-2576.2	0.4364
-2599.0	0.4776
-2556.6	0.5341
-2360.9	0.6029
-2195.0	0.6427

HD-HA systems (BAC = 6)



CARBON DIOXIDE (1) + 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE (2)

CAS	124-38-9	431-89-0
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	YFMFNYKEUDLDTL-UHFFFAOYSA-N
T_c / K	304.21	374.83
P_c / bar	73.83	29.12
ω	0.224	0.355

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

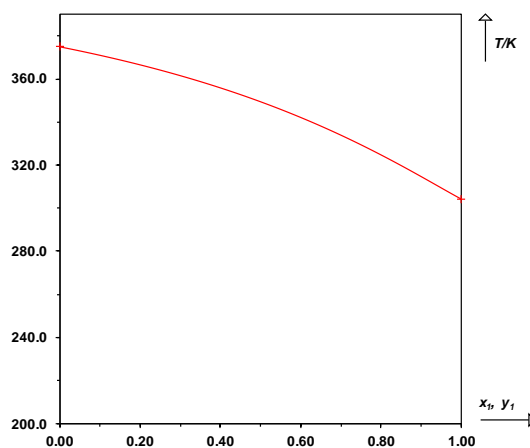
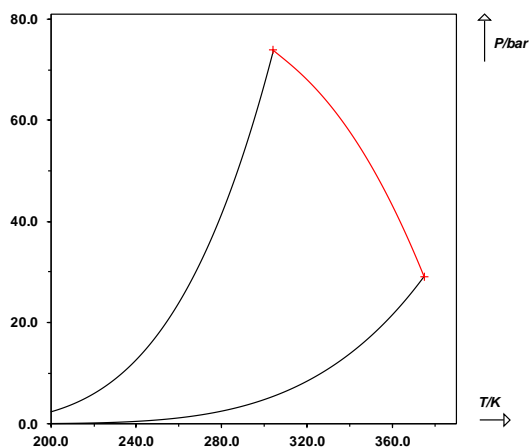
$A/\text{MPa} = 48.97$

$B/\text{MPa} = -18.62$

Deviations

MAPE on $x = 2.8\%$

MAPE on $y = 3.9\%$



-----			19.10	0.4140	0.8470
Isothermal phase equilibrium data			23.51	0.5200	0.8860
-----			27.58	0.6090	0.9110
Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D., Vapor–liquid equilibrium data for the CO ₂ + 1,1,1,2,3,3,3,- heptafluoropropane (R227ea) system at temperatures from 276.01 to 367.30 K and pressures up to 7.4 MPa, Fluid Phase Equilibria. 207 (2003) 53-67. doi:10.1016/S0378-3812(02)00326-6			31.03	0.6860	0.9300
T / K = 276.01			34.68	0.7570	0.9470
P / bar	x ₁	y ₁	37.85	0.8130	0.9590
4.566	0.0934	0.5408	42.06	0.8830	0.9730
6.378	0.1592	0.6822	45.57	0.9290	0.9840
9.358	0.2615	0.7944	Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D., Vapor–liquid equilibrium data for the CO ₂ + 1,1,1,2,3,3,3,- heptafluoropropane (R227ea) system at temperatures from 276.01 to 367.30 K and pressures up to 7.4 MPa, Fluid Phase Equilibria. 207 (2003) 53-67. doi:10.1016/S0378-3812(02)00326-6		
13.35	0.3950	0.8680	T / K = 293.15		
17.43	0.5188	0.9070	P / bar	x ₁	y ₁
21.84	0.6434	0.9366	5.341	0.0423	0.2750
25.85	0.7471	0.9561	6.599	0.0774	0.4153
29.44	0.8335	0.9696	7.964	0.1125	0.5189
31.93	0.8887	0.9779	11.04	0.1887	0.6622
34.42	0.9400	0.9875	14.51	0.2752	0.7528
Kim, Seol A. - Lim, Jong Sung - Kang, Jeong Won, Isothermal Vapor–Liquid Equilibria for the Binary System of Carbon Dioxide (CO ₂) + 1,1,1,2,3,3,3- Heptafluoropropane (R-227ea), Journal of Chemical & Engineering Data. 55 (2010) 4999-5003. doi:10.1021/je100583z			20.76	0.4184	0.8385
T / K = 278.15			28.93	0.5886	0.8953
P / bar	x ₁	y ₁	37.82	0.7482	0.9360
4.140	0.0760	0.4330	44.87	0.8539	0.9610
6.430	0.1480	0.6380	50.12	0.9216	0.9769
11.12	0.3010	0.8100	52.61	0.9518	0.9853
15.27	0.4190	0.8740	Kim, Seol A. - Lim, Jong Sung - Kang, Jeong Won, Isothermal Vapor–Liquid Equilibria for the Binary System of Carbon Dioxide (CO ₂) + 1,1,1,2,3,3,3- Heptafluoropropane (R-227ea), Journal of Chemical & Engineering Data. 55 (2010) 4999-5003. doi:10.1021/je100583z		
20.03	0.5580	0.9200	T / K = 298.15		
23.51	0.6560	0.9440	P / bar	x ₁	y ₁
27.10	0.7460	0.9610	9.450	0.1100	0.4700
30.99	0.8340	0.9760	14.48	0.2270	0.6830
33.96	0.8970	0.9860	18.89	0.3260	0.7800
35.72	0.9280	0.9910	22.82	0.4070	0.8290
36.13	0.9330	0.9920	29.30	0.5370	0.8820
Kim, Seol A. - Lim, Jong Sung - Kang, Jeong Won, Isothermal Vapor–Liquid Equilibria for the Binary System of Carbon Dioxide (CO ₂) + 1,1,1,2,3,3,3- Heptafluoropropane (R-227ea), Journal of Chemical & Engineering Data. 55 (2010) 4999-5003. doi:10.1021/je100583z			35.44	0.6490	0.9140
T / K = 288.15			41.02	0.7410	0.9310
P / bar	x ₁	y ₁	47.37	0.8300	0.9470
7.650	0.1150	0.5380	53.57	0.9050	0.9670
13.10	0.2630	0.7480	57.85	0.9480	0.9790
Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D., Vapor–liquid equilibrium data for the CO ₂ + 1,1,1,2,3,3,3,- heptafluoropropane (R227ea) system at temperatures from 276.01 to 367.30 K and pressures up to 7.4 MPa,					

HD-HA systems (BAC = 6)

Fluid Phase Equilibria. 207 (2003) 53-67.
doi:10.1016/S0378-3812(02)00326-6

T / K = 303.15

P / bar	x_1	y_1
6.556	0.0312	0.1894
8.491	0.0767	0.3752
11.93	0.1559	0.5598
15.95	0.2432	0.6768
21.88	0.3619	0.7744
28.91	0.4899	0.8353
36.93	0.6202	0.8806
45.83	0.7460	0.9167
53.77	0.8400	0.9424
60.66	0.9103	0.9618
65.55	0.9532	0.9772
68.80	0.9779	0.9885

Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D., Vapor-liquid equilibrium data for the CO₂ + 1,1,1,2,3,3,3,-heptafluoropropane (R227ea) system at temperatures from 276.01 to 367.30 K and pressures up to 7.4 MPa, Fluid Phase Equilibria. 207 (2003) 53-67.
doi:10.1016/S0378-3812(02)00326-6

T / K = 305.17

P / bar	x_1	y_1
10.14	0.1083	0.4431
20.00	0.3108	0.7310
29.98	0.4899	0.8317
39.97	0.6448	0.8848
49.86	0.7736	0.9149
58.86	0.8708	0.9453

Kim, Seol A. - Lim, Jong Sung - Kang, Jeong Won, Isothermal Vapor-Liquid Equilibria for the Binary System of Carbon Dioxide (CO₂) + 1,1,1,2,3,3,3-Heptafluoropropane (R-227ea), Journal of Chemical & Engineering Data. 55 (2010) 4999-5003.
doi:10.1021/je100583z

T / K = 308.15

P / bar	x_1	y_1
10.14	0.0880	0.4210
18.20	0.2420	0.6650
25.51	0.3760	0.7680
33.03	0.5060	0.8230
44.82	0.6870	0.8850
49.71	0.7450	0.9000
56.61	0.8260	0.9160
61.29	0.8730	0.9290

Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D., Vapor-liquid equilibrium data for the CO₂ + 1,1,1,2,3,3,3,-heptafluoropropane (R227ea) system at temperatures

from 276.01 to 367.30 K and pressures up to 7.4 MPa, Fluid Phase Equilibria. 207 (2003) 53-67.
doi:10.1016/S0378-3812(02)00326-6

T / K = 313.15

P / bar	x_1	y_1
9.918	0.0596	0.2760
13.02	0.1213	0.4468
17.83	0.2097	0.5982
23.86	0.3160	0.7046
29.86	0.4152	0.7693
36.83	0.5230	0.8198
43.83	0.6206	0.8551
50.91	0.7070	0.8797
56.83	0.7691	0.8988
61.12	0.8119	0.9098
64.78	0.8442	0.9186
67.88	0.8695	0.9254
69.51	0.8832	0.9285
70.74	0.8943	0.9298
71.92	0.9048	0.9303

Kim, Seol A. - Lim, Jong Sung - Kang, Jeong Won, Isothermal Vapor-Liquid Equilibria for the Binary System of Carbon Dioxide (CO₂) + 1,1,1,2,3,3,3-Heptafluoropropane (R-227ea), Journal of Chemical & Engineering Data. 55 (2010) 4999-5003.
doi:10.1021/je100583z

T / K = 318.15

P / bar	x_1	y_1
13.72	0.1080	0.3930
20.13	0.2140	0.5890
27.72	0.3360	0.7070
33.44	0.4200	0.7540
38.20	0.4870	0.7840
47.99	0.6170	0.8240
54.54	0.6930	0.8480
60.95	0.7640	0.8630

Kim, Seol A. - Lim, Jong Sung - Kang, Jeong Won, Isothermal Vapor-Liquid Equilibria for the Binary System of Carbon Dioxide (CO₂) + 1,1,1,2,3,3,3-Heptafluoropropane (R-227ea), Journal of Chemical & Engineering Data. 55 (2010) 4999-5003.
doi:10.1021/je100583z

T / K = 328.15

P / bar	x_1	y_1
16.55	0.1050	0.3450
23.99	0.2160	0.5420
31.03	0.3140	0.6480
37.99	0.4060	0.7160
43.85	0.4810	0.7450
49.30	0.5450	0.7600

HD-HA systems (BAC = 6)

56.61	0.6310	0.7740		26.87	0.0246	0.0453
62.81	0.6990	0.7800		28.86	0.0506	0.0860
				30.86	0.0763	0.1222

Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D.,
 Vapor–liquid equilibrium data for the CO₂ + 1,1,1,2,3,3,3,-
 heptafluoropropane (R227ea) system at temperatures
 from 276.01 to 367.30 K and pressures up to 7.4 MPa,
 Fluid Phase Equilibria. 207 (2003) 53-67.
 doi:10.1016/S0378-3812(02)00326-6

T / K = 333.15

P / bar	x ₁	y ₁
13.69	0.0308	0.1200
18.20	0.1010	0.3176
23.90	0.1896	0.4701
29.97	0.2740	0.5704
36.51	0.3619	0.6428
42.97	0.4417	0.6903
49.98	0.5231	0.7322
55.95	0.5899	0.7533
60.18	0.6360	0.7610
62.95	0.6670	0.7628
65.03	0.6886	0.7614
66.46	0.7118	0.7559

Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D.,
 Vapor–liquid equilibrium data for the CO₂ + 1,1,1,2,3,3,3,-
 heptafluoropropane (R227ea) system at temperatures
 from 276.01 to 367.30 K and pressures up to 7.4 MPa,
 Fluid Phase Equilibria. 207 (2003) 53-67.
 doi:10.1016/S0378-3812(02)00326-6

T / K = 353.15

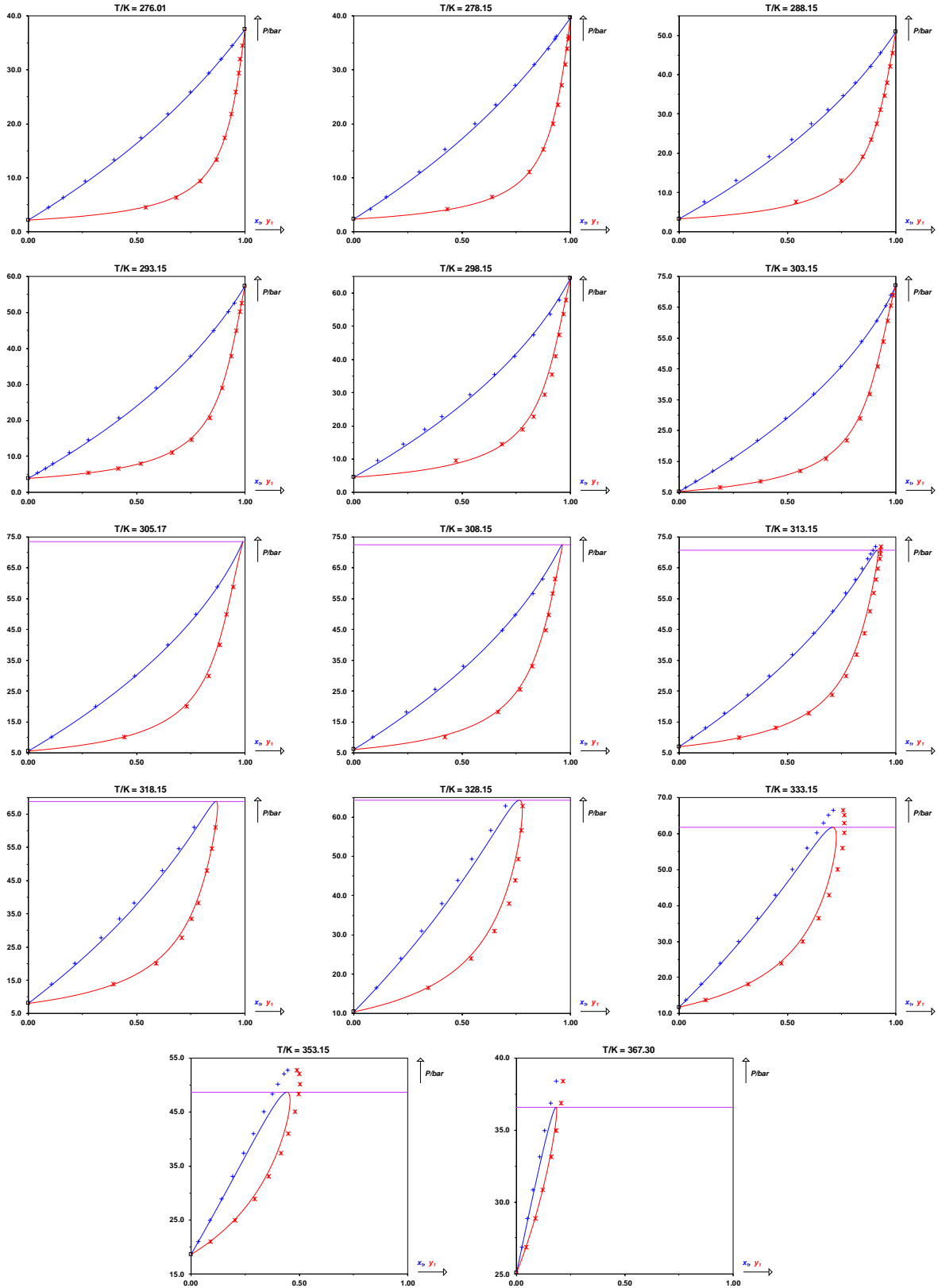
P / bar	x ₁	y ₁
20.98	0.0339	0.0897
24.90	0.0871	0.2023
28.95	0.1402	0.2929
33.03	0.1914	0.3588
37.35	0.2435	0.4140
40.98	0.2864	0.4497
45.03	0.3357	0.4804
48.32	0.3756	0.4972
50.14	0.3996	0.5032
52.04	0.4298	0.4985
52.73	0.4466	0.4871

Valtz, A. - Coquelet, C. - Baba-Ahmed, A. - Richon, D.,
 Vapor–liquid equilibrium data for the CO₂ + 1,1,1,2,3,3,3,-
 heptafluoropropane (R227ea) system at temperatures
 from 276.01 to 367.30 K and pressures up to 7.4 MPa,
 Fluid Phase Equilibria. 207 (2003) 53-67.
 doi:10.1016/S0378-3812(02)00326-6

T / K = 367.30

P / bar	x ₁	y ₁
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HD-HA systems (BAC = 6)



1,1,1,2,3,3,3-HEPTAFLUOROPROPANE (1) + SULFUR DIOXIDE (2)

CAS	431-89-0	7446-09-5
InChiKey	YFMFNYKEUDLDTL-UHFFFAOYSA-N	RAHZWNYVWXNFOC-UHFFFAOYSA-N
T_c / K	374.83	430.75
P_c / bar	29.12	78.84
ω	0.355	0.245

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 123.5$

$B/\text{MPa} = 141.7$

Deviations

MAPE on $x = 6.2\%$

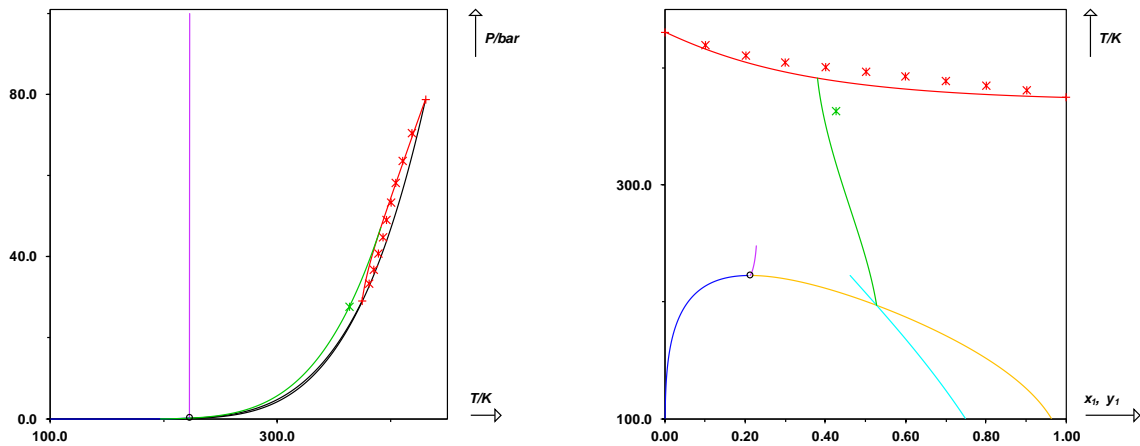
MAPE on $y = 4.4\%$

MAPE on $x_c = 52\%$

MAPE on $P_c = 6.0\%$

MAPE on $x_{az} = 6.7\%$

MAPE on $P_{az} = 0.42\%$



Isothermal phase equilibrium data					
-----			10.96	0.5170	0.4960
Isothermal phase equilibrium data			10.49	0.7290	0.6720
-----			10.00	0.8410	0.7910
Valtz, A - Coquelet, C - Richon, D, Vapor–liquid equilibrium data for the sulfur dioxide (SO ₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016			9.630	0.9160	0.8810
T / K = 288.07			9.420	0.9540	0.9310
P / bar	x ₁	y ₁	Valtz, A - Coquelet, C - Richon, D, Vapor–liquid equilibrium data for the sulfur dioxide (SO ₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016		
3.510	0.0950	0.2420	T / K = 343.15		
3.680	0.1590	0.2960	P / bar	x ₁	y ₁
3.800	0.2400	0.3520	14.75	0.0170	0.0450
3.860	0.3080	0.3880	15.42	0.0440	0.0990
3.890	0.3660	0.4180	16.17	0.0870	0.1610
3.880	0.6150	0.5700	16.87	0.1460	0.2230
3.790	0.7110	0.6510	17.44	0.2330	0.2900
3.520	0.8930	0.8450	17.70	0.2980	0.3370
Valtz, A - Coquelet, C - Richon, D, Vapor–liquid equilibrium data for the sulfur dioxide (SO ₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016			17.82	0.5010	0.4810
T / K = 303.15			17.31	0.6640	0.6200
P / bar	x ₁	y ₁	16.59	0.7880	0.7410
4.950	0.0180	0.0740	16.04	0.8590	0.8190
5.290	0.0450	0.1460	15.54	0.9220	0.8960
5.620	0.0890	0.2160	Valtz, A - Coquelet, C - Richon, D, Vapor–liquid equilibrium data for the sulfur dioxide (SO ₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016		
6.010	0.1920	0.3050	T / K = 363.15		
6.260	0.3600	0.4030	P / bar	x ₁	y ₁
6.280	0.5070	0.4920	23.19	0.0160	0.0380
6.180	0.6410	0.5900	23.96	0.0390	0.0780
5.920	0.7880	0.7240	24.88	0.0740	0.1270
5.720	0.8650	0.8110	25.67	0.1150	0.1740
5.570	0.9160	0.8750	26.35	0.1660	0.2230
Valtz, A - Coquelet, C - Richon, D, Vapor–liquid equilibrium data for the sulfur dioxide (SO ₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016			26.82	0.2170	0.2630
T / K = 323.15			27.11	0.2570	0.2920
P / bar	x ₁	y ₁	27.27	0.2860	0.3170
9.040	0.0270	0.0810	27.57	0.4260	0.4260
9.510	0.0550	0.1390	27.57	0.4290	0.4270
10.04	0.1060	0.2060	26.78	0.6410	0.6100
10.52	0.1890	0.2780	26.06	0.7310	0.6970
10.88	0.3150	0.3610	25.46	0.7930	0.7610
			24.75	0.8570	0.8300
			24.00	0.9190	0.9000
			Valtz, A - Coquelet, C - Richon, D, Vapor–liquid equilibrium data for the sulfur dioxide (SO ₂) + 1,1,1,2,3,3,3-		

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heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016

T / K = 374.23

P / bar	x_1	y_1
29.36	0.0210	0.0430
30.52	0.0530	0.0920
32.00	0.1130	0.1630
33.38	0.2050	0.2470
34.00	0.2750	0.3030
34.39	0.4600	0.4530
33.30	0.6510	0.6310
31.56	0.8100	0.7900

Valtz, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the sulfur dioxide (SO₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016

T / K = 383.17

P / bar	x_1	y_1
35.04	0.0230	0.0410
37.27	0.0860	0.1240
38.93	0.1620	0.2010
40.02	0.2430	0.2710
40.39	0.2840	0.3060
40.57	0.3110	0.3260
40.74	0.3450	0.3570
40.79	0.4860	0.4830
40.75	0.4940	0.4910

Valtz, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the sulfur dioxide (SO₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016

T / K = 393.15

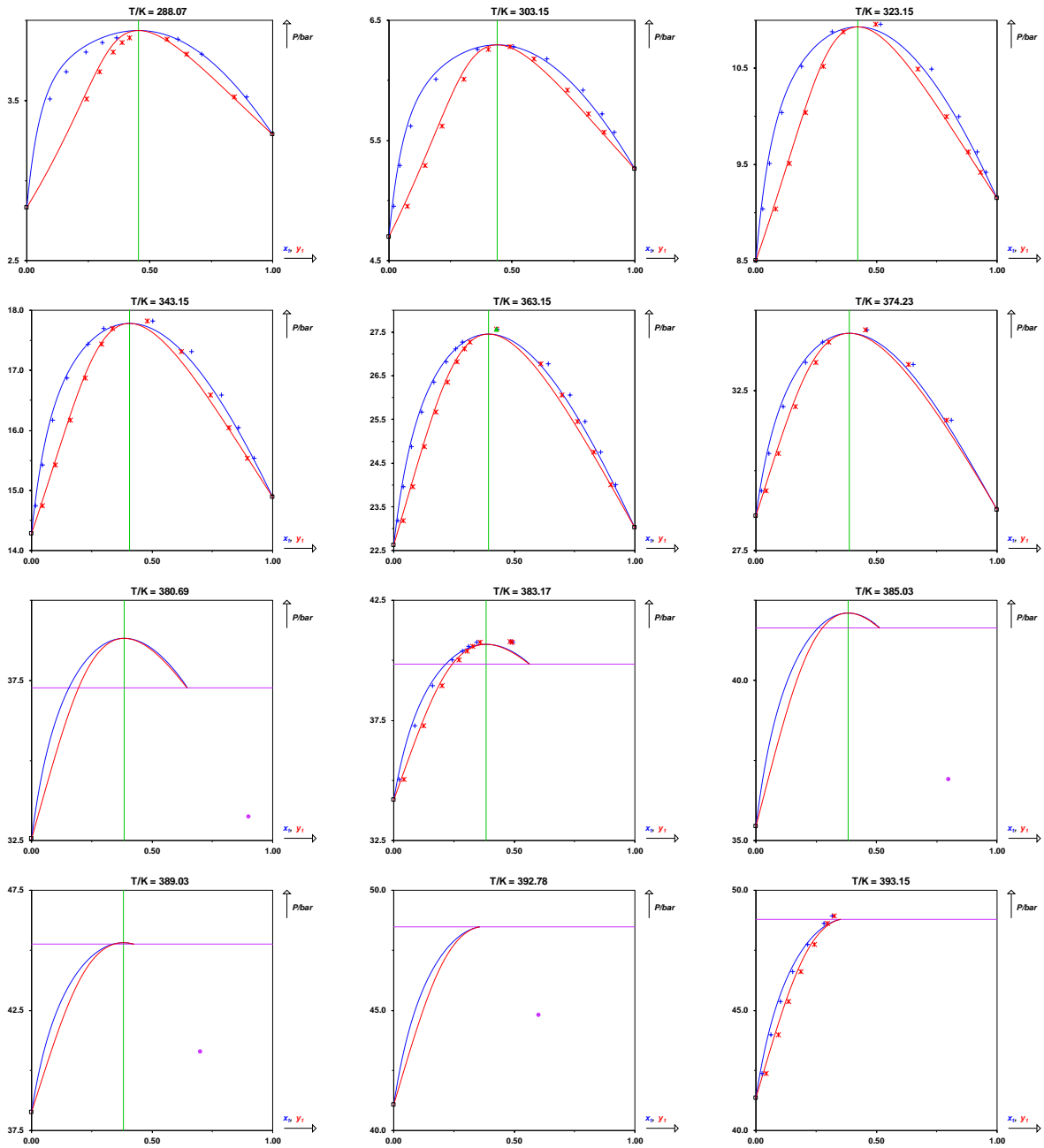
P / bar	x_1	y_1
42.36	0.0240	0.0420
43.99	0.0610	0.0940
45.36	0.1010	0.1350
46.61	0.1520	0.1850
47.75	0.2140	0.2420
48.62	0.2830	0.2960
48.92	0.3150	0.3240

Critical point

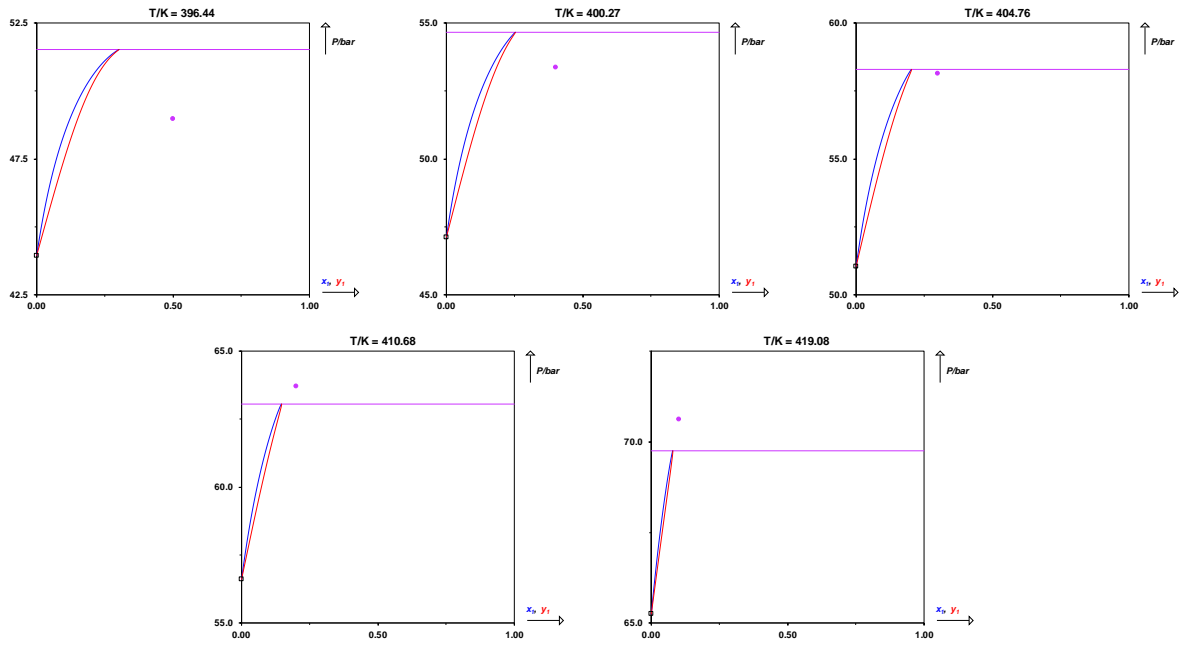
Valtz, A - Coquelet, C - Richon, D, Vapor-liquid equilibrium data for the sulfur dioxide (SO₂) + 1,1,1,2,3,3,3-heptafluoropropane (R227ea) system at temperatures from 288.07 to 403.19 K and pressures up to 5.38 MPa, Fluid Phase Equilibria. 220 (2004) 75-82. doi:10.1016/j.fluid.2004.02.016

T / K	P / bar	x_1
380.69	33.25	0.9000
385.03	36.91	0.8000
389.03	40.77	0.7000
392.78	44.79	0.6000
396.44	48.97	0.5000
400.27	53.36	0.4000
404.76	58.13	0.3000
410.68	63.70	0.2000
419.08	70.61	0.1000

HD-HA systems (BAC = 6)



HD-HA systems (BAC = 6)



METHANOL (1) + HALOTHANE (2)

CAS	67-56-1	151-67-7
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	BCQZXOMGPXTTIC-UHFFFAOYSA-N
T_c / K	512.50	496.00
P_c / bar	80.84	39.20
ω	0.566	0.275

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 146.6$$

$$B/\text{MPa} = 33.18$$

Deviations

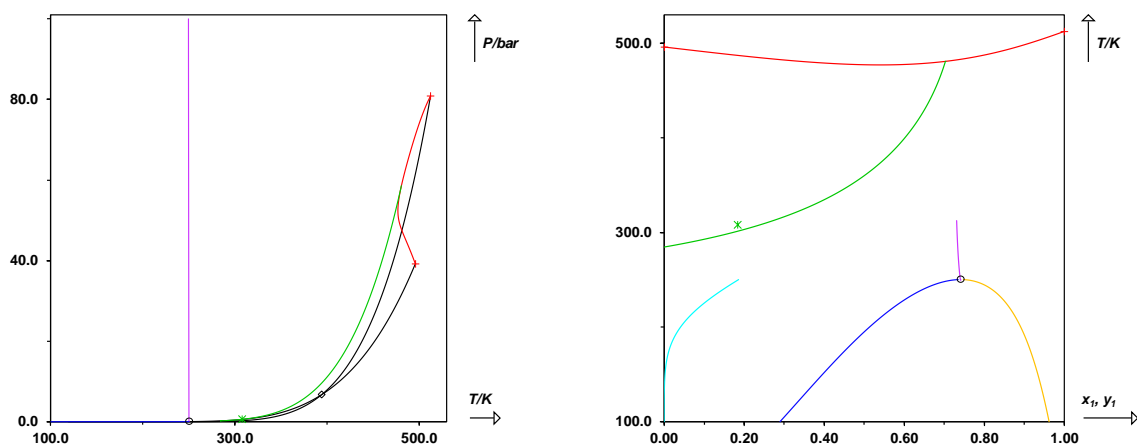
$$\text{MAPE on } x = 36\%$$

$$\text{MAPE on } y = 23\%$$

$$\text{MAPE on } x_{\text{az}} = 19\%$$

$$\text{MAPE on } P_{\text{az}} = 8.1\%$$

$$\text{MAPE on } c_p^M = 172\%$$



Isothermal phase equilibrium data

Gmehling, Juergen - Onken, Ulfert - Schulte, Hans Werner, Vapor-liquid equilibria for the binary systems diethyl ether-haloethane (1,1,1-trifluoro-2-bromo-2-chloroethane), haloethane-methanol, and diethyl ether-methanol, Journal of Chemical & Engineering Data. 25 (1980) 29-32. doi:10.1021/je60084a016

T / K =	303.15	
P / bar	x ₁	y ₁
0.2623	0.9247	0.8054
0.3621	0.7946	0.4737
0.4134	0.7216	0.3794
0.4557	0.6398	0.3164
0.4826	0.5675	0.2806
0.4920	0.5348	0.2674
0.5006	0.4991	0.2566
0.5324	0.2328	0.1902
0.5333	0.1685	0.1721
0.5339	0.1535	0.1678

Fenclova, D. - Dohnal, V., Excess Gibbs energy. Bromochloro-1,1,1-trifluoroethane - methanol system, Int. Data Ser. Sel. Data Mixtures Ser. A. 21 (1993)

T / K =	308.15	
P / bar	x ₁	y ₁
0.2842	0.9936	0.9787
0.2906	0.9845	0.9484
0.3139	0.9540	0.8520
0.3388	0.9236	0.7639
0.3530	0.9069	0.7203
0.3664	0.8923	0.6812
0.3911	0.8652	0.6179
0.4252	0.8281	0.5434
0.4507	0.7994	0.4950
0.4959	0.7453	0.4217
0.5257	0.7048	0.3790
0.5688	0.6312	0.3242
0.6093	0.5257	0.2740
0.6349	0.4057	0.2385
0.6454	0.3164	0.2175
0.6500	0.2449	0.2003
0.6515	0.1896	0.1854
0.6518	0.1838	0.1838
0.6510	0.1486	0.1722
0.6506	0.1403	0.1691
0.6482	0.1113	0.1556
0.6350	0.0551	0.1133
0.6121	0.0204	0.0577

AZEO

Isobaric phase equilibrium data

Gmehling, Juergen - Onken, Ulfert - Schulte, Hans Werner, Vapor-liquid equilibria for the binary systems diethyl ether-haloethane (1,1,1-trifluoro-2-bromo-2-chloroethane), haloethane-methanol, and diethyl ether-methanol, Journal of Chemical & Engineering Data. 25 (1980) 29-32. doi:10.1021/je60084a016

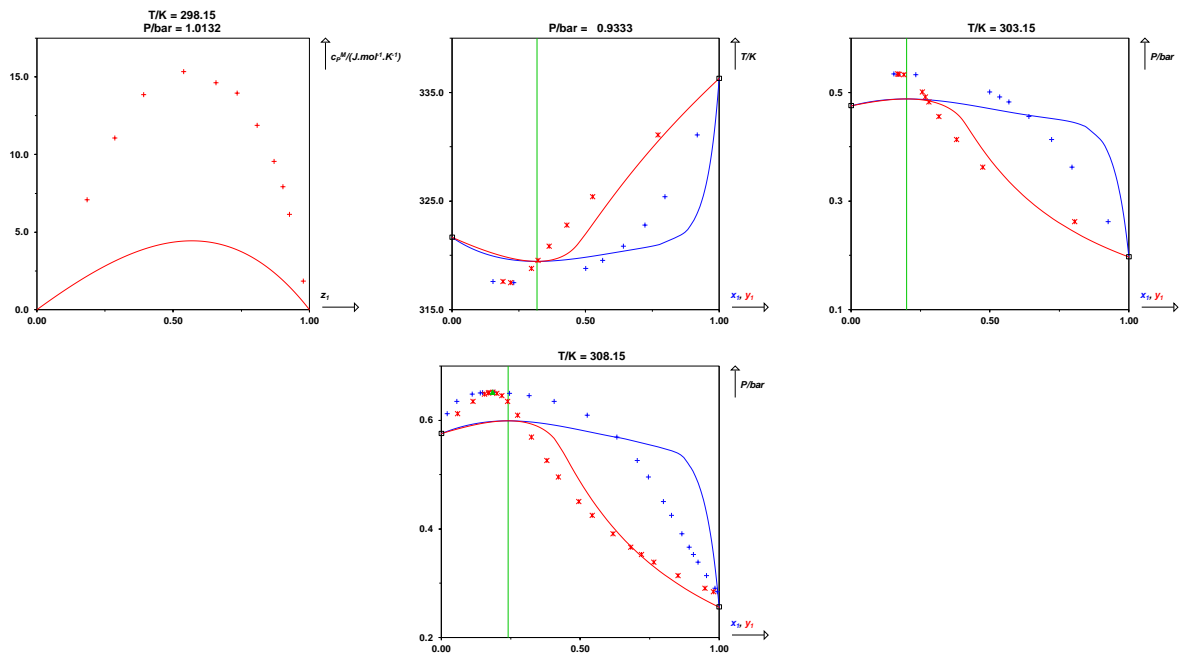
P / bar =	0.9333	
T / K	x ₁	y ₁
331.09	0.9178	0.7716
325.40	0.7964	0.5255
322.78	0.7227	0.4302
320.83	0.6412	0.3641
319.52	0.5643	0.3219
318.79	0.5008	0.2965
317.50	0.2316	0.2194
317.60	0.1525	0.1904

Heat capacity of mixing

Costas, M., Excess heat capacity. Bromochloro-1,1,1-trifluoroethane - methanol system, Int. Data Ser. Sel. Data Mixtures Ser. A. 21 (1993)

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
c _P ^M / J.mol ⁻¹ .K ⁻¹	x ₁	
1.830	0.9779	
6.130	0.9265	
7.930	0.9026	
9.550	0.8703	
11.89	0.8086	
13.97	0.7347	
14.62	0.6566	
15.34	0.5388	
13.85	0.3910	
11.07	0.2850	
7.090	0.1844	

SA-HD systems (BAC = 7)



1-HEXYNE (1) + ACETONITRILE (2)

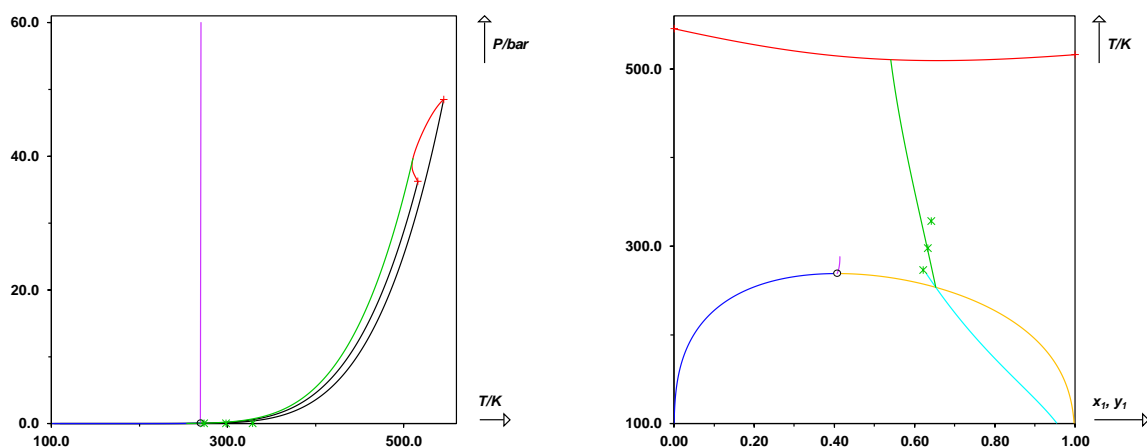
CAS	693-02-7	75-05-8
InChiKey	CGHIBGNXEGJPQZ-UHFFFAOYSA-N	WEVYAHXRMPXWCK-UHFFFAOYSA-N
T_c / K	516.20	545.50
P_c / bar	36.20	48.50
ω	0.333	0.342

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

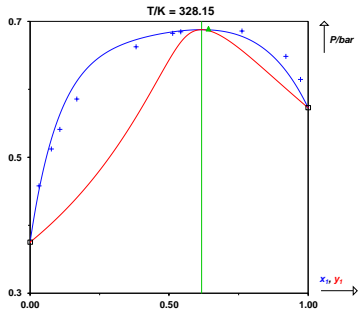
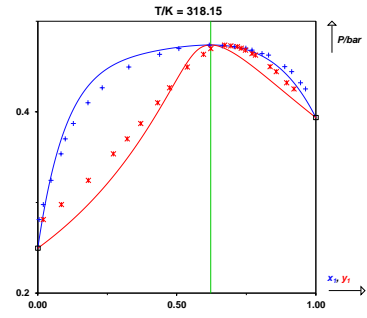
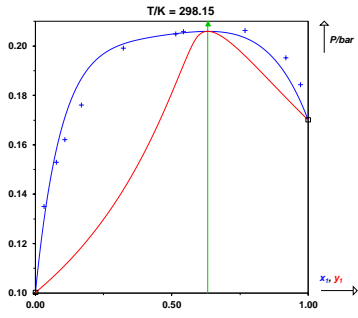
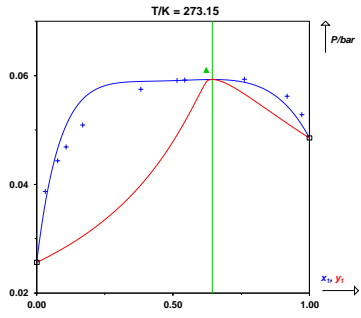
A/MPa = 96.34

B/MPa = 112.5

*Deviations*MAPE on x = 16 %MAPE on y = 31 %MAPE on x_{az} = 3.5 %MAPE on P_{az} = 1.5 %

SA-HD systems (BAC = 7)

-----			0.4634	0.4380	0.5950
Isothermal phase equilibrium data			0.4697	0.5070	0.6220
-----			0.4737	0.6170	0.6720
Harris, H.G., Vapor-Liquid Equilibria in Binary Hydrocarbon - Polar Solvent Systems (1968)			0.4726	0.6640	0.6940
T / K = 273.15			0.4718	0.7070	0.7170
P / bar x_1			0.4702	0.7480	0.7310
0.0387 0.0320			0.4680	0.7700	0.7460
0.0443 0.0768			0.4641	0.8060	0.7700
0.0469 0.1080			0.4625	0.8300	0.7820
0.0509 0.1686			0.4498	0.8880	0.8350
0.0575 0.3821			0.4445	0.9130	0.8570
0.0591 0.5141			0.4320	0.9450	0.8950
0.0592 0.5432			0.4254	0.9620	0.9210
0.0610 0.6210 AZEO					
0.0593 0.7614					
0.0562 0.9180					
0.0528 0.9719					
Harris, H.G., Vapor-Liquid Equilibria in Binary Hydrocarbon - Polar Solvent Systems (1968)					
T / K = 328.15					
P / bar x_1					
0.4581 0.0315					
0.5122 0.0758					
0.5410 0.1069					
0.5856 0.1675					
0.6627 0.3812					
0.6822 0.5129					
0.6847 0.5423					
0.6890 0.6410 AZEO					
0.6858 0.7615					
0.6482 0.9198					
0.6145 0.9728					
Harris, H.G., Vapor-Liquid Equilibria in Binary Hydrocarbon - Polar Solvent Systems (1968)					
T / K = 298.15					
P / bar x_1					
0.1351 0.0318					
0.1529 0.0765					
0.1621 0.1077					
0.1760 0.1683					
0.1991 0.3218					
0.2049 0.5137					
0.2058 0.5429					
0.2090 0.6330 AZEO					
0.2063 0.7687					
0.1952 0.9184					
0.1843 0.9721					
Desplanches, Hervé - Chevalier, Jean-Louis - Llinas, Richard, Étude thermodynamique de solutions d'acétonitrile et d'hydrocarbures acétyléniques, Journal de Chimie Physique. 74 (1977) 259-265. doi:10.1051/jcp/1977740259					
T / K = 318.15					
P / bar x_1 y_1					
0.2813 0.0050 0.0190					
0.2976 0.0200 0.0840					
0.3245 0.0470 0.1820					
0.3537 0.0830 0.2720					
0.3701 0.0980 0.3220					
0.3872 0.1280 0.3700					
0.4098 0.1800 0.4310					
0.4265 0.2310 0.4740					
0.4496 0.3270 0.5370					



CHLOROFORM (1) + ACETONITRILE (2)

CAS	67-66-3	75-05-8
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	WEVYAHXRMPXWCK-UHFFFAOYSA-N
T_c / K	536.40	545.50
P_c / bar	54.72	48.50
ω	0.222	0.342

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 19.95$$

$$B/\text{MPa} = -65.32$$

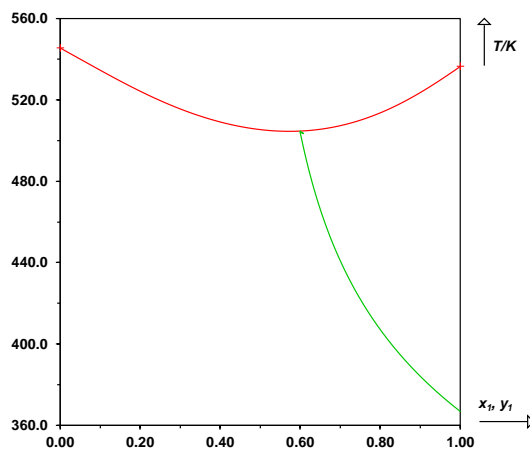
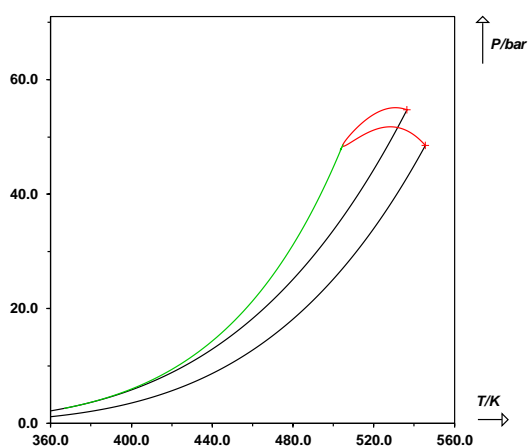
Deviations

$$\text{MAPE on } x = 13 \%$$

$$\text{MAPE on } y = 15 \%$$

$$\text{MAPE on } h^M = 28 \%$$

$$\text{MAPE on } c_p^M = 200 \%$$



-----			351.25	0.0790	0.1790
Isothermal phase equilibrium data			350.15	0.1070	0.2320
-----			348.75	0.1470	0.2930
Lazarte, Manuel - Gómez Marigliano, Ana C. - Sólamo, Horacio N., Excess Molar Volume, Viscosity, and Molar Refraction Deviations, and Liquid-Vapor Equilibrium at 303.15 K for Chloroform + Acetonitrile Binary Mixture. An Infrared Study, Journal of Solution Chemistry. 33 (2004) 1549-1563. doi:10.1007/s10953-004-1393-9			347.75	0.1780	0.3410
T / K = 303.15			346.85	0.2130	0.3850
P / bar	x ₁	y ₁	345.75	0.2520	0.4350
0.1727	0.0750	0.1830	344.85	0.2930	0.4760
0.1840	0.1200	0.2570	343.95	0.3340	0.5190
0.2019	0.2120	0.3920	343.15	0.3790	0.5600
0.2160	0.2990	0.4990	342.35	0.4240	0.6010
0.2287	0.3680	0.5520	341.75	0.4620	0.6310
0.2446	0.4690	0.6460	341.05	0.5020	0.6630
0.2600	0.5550	0.7190	340.45	0.5430	0.6950
0.2800	0.6600	0.7950	339.85	0.5790	0.7230
0.2993	0.8040	0.8930	339.25	0.6160	0.7500
0.3079	0.8520	0.9160	338.75	0.6440	0.7710
			338.55	0.6630	0.7840
			338.25	0.6860	0.8030
			337.75	0.7110	0.8220
			337.45	0.7420	0.8400
			337.05	0.7690	0.8570
Nagata, Isamu - Kawamura, Yuji, Excess thermodynamic functions and complex formation in binary liquid mixtures containing acetonitrile, Fluid Phase Equilibria. 3 (1979) 1-11. doi:10.1016/0378-3812(79)80023-0			336.65	0.8060	0.8800
T / K = 328.15			336.15	0.8620	0.9130
P / bar	x ₁	y ₁	335.85	0.8840	0.9280
0.4440	0.0400	0.0950	335.05	0.9660	0.9760
0.4897	0.1090	0.2320	-----		
0.5445	0.2300	0.3950	Enthalpy of mixing		
0.5929	0.3380	0.5090	-----		
0.6279	0.4240	0.5860	Handa, Yash Paul - Jones, David Edward, Molar excess enthalpies of acetonitrile + chloroform and of acetonitrile + chloroform-d1 at 298 K, Canadian Journal of Chemistry. 55 (1977) 2977-2979. doi:10.1139/v77-414		
0.6767	0.5490	0.6930	T / K = 298.15		
0.7045	0.6380	0.7560	P / bar = UNKNOWN (1.0132)		
0.7546	0.7850	0.8620	h ^M / J.mol ⁻¹	x ₁	
0.7735	0.8590	0.9100	-24.80	0.0140	
0.7983	0.9340	0.9550	-79.30	0.0480	
0.7999	0.9380	0.9580	-197.60	0.1160	
-----			-325.10	0.1860	
Isobaric phase equilibrium data			-438.70	0.2490	
-----			-534.70	0.3050	
Mato, F. - Sanchez, M., Liquid-vapor equilibria of binary mixtures of acetonitrile, Anales de la Real Sociedad Espanola de Fisica y Quimica, Serie B: Quimica. 63 (1967) 1-11.			-612.80	0.3530	
P / bar = 1.013			-683.10	0.4010	
T / K	x ₁	y ₁	-759.10	0.4770	
354.15	0.0150	0.0420	-810.30	0.5520	
353.25	0.0350	0.0880	-821.10	0.6250	
352.15	0.0570	0.1380	-751.40	0.7230	
			-607.30	0.8100	
			-365.60	0.9000	

-115.70	0.9720	1.373	0.9517
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Nagata, Isamura - Tamura, Kazuhiro, Excess enthalpies of acetonitrile + trichloromethane, + ethyl acetate, and + methyl acetate, and of (acetonitrile + trichloromethane) + ethyl acetate and + methyl acetate at 308.15 K, The Journal of Chemical Thermodynamics. 15 (1983) 721-724. doi:10.1016/0021-9614(83)90138-6

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J} \cdot \text{mol}^{-1}$ x_1

-70.60 0.0442

-205.80 0.1234

-400.60 0.2355

-527.80 0.3100

-615.00 0.3645

-678.40 0.4139

-711.00 0.4423

-760.40 0.5244

-785.90 0.5932

-778.70 0.6437

-734.60 0.7137

-601.40 0.8011

-405.60 0.8819

-203.40 0.9450

-63.70 0.9825

Heat capacity of mixing

Zegers, H.C. - Somsen, G., Volumes and heat capacities of mixtures of dimethylformamide with several dialkylacetamides, Fluid Phase Equilibria. 18 (1984) 299-311. doi:10.1016/0378-3812(84)85013-X

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J} \cdot \text{mol}^{-1} \cdot \text{K}^{-1}$ x_1

0.6760 0.0577

1.334 0.1399

2.064 0.1950

2.822 0.2739

2.968 0.2914

3.407 0.3433

3.781 0.4111

4.357 0.5034

4.611 0.5907

4.566 0.6745

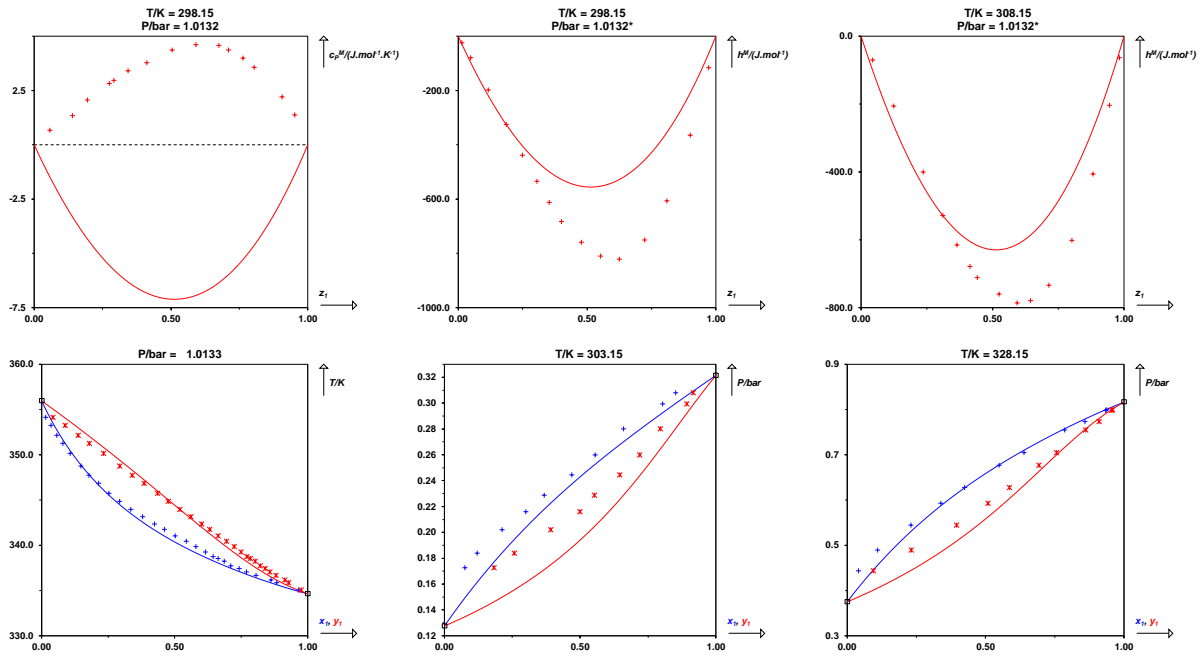
4.352 0.7100

3.993 0.7631

3.566 0.8034

2.207 0.9063

SA-HD systems (BAC = 7)



ETHANOL (1) + 1-HEPTYNE (2)

CAS	64-17-5	628-71-7
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	YVXHZKCCZYLQOP-UHFFFAOYSA-N
T_c / K	514.00	547.00
P_c / bar	61.37	32.10
ω	0.644	0.378

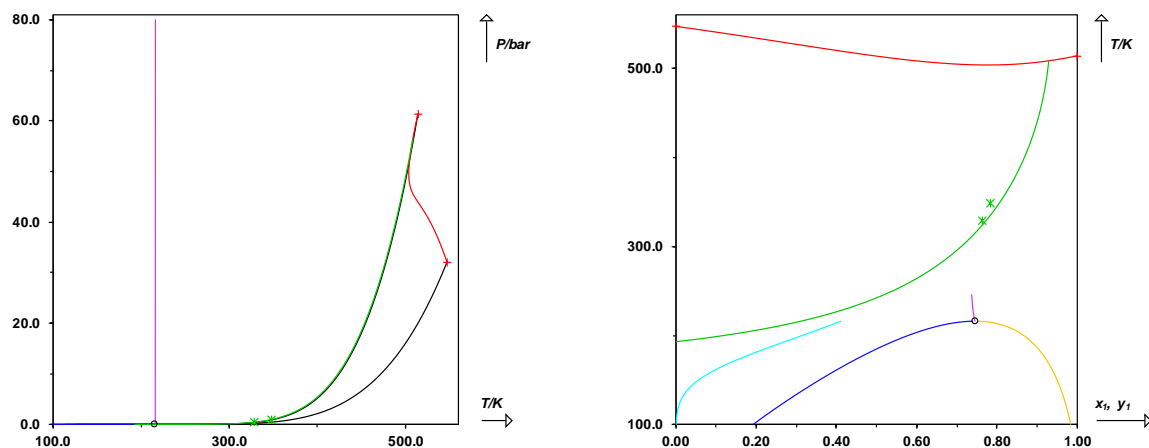
Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

 $A/\text{MPa} = 95.93$ $B/\text{MPa} = 48.28$

Deviations

MAPE on $x = 18\%$ MAPE on $y = 6.7\%$ MAPE on $x_{az} = 4.6\%$ MAPE on $P_{az} = 0.94\%$ MAPE on $h^M = 48\%$ 

-----			$h^M / \text{J.mol}^{-1}$	x_1
Isothermal phase equilibrium data			650.00	0.1039
-----			842.60	0.2045
Zudkevitch, David - Lindrud, Mark - Chu, Yi-Zhi, Vapor-Liquid Equilibria for Ethanol + Hept-1-yne and Butyric Acid + Butyric Anhydride, Journal of Chemical & Engineering Data. 44 (1999) 393-397. doi:10.1021/je980210f			863.00	0.2340
T / K = 328.15			857.20	0.2917
P / bar	x_1	y_1	850.20	0.3211
0.2573	0.0653	0.2792	836.60	0.3566
0.3033	0.1299	0.4249	816.60	0.3877
0.3429	0.2028	0.5073	727.20	0.4988
0.3778	0.2767	0.5703	605.80	0.6186
0.4034	0.4248	0.6514	412.00	0.7585
0.4125	0.4768	0.6698	261.20	0.8422
0.4196	0.5803	0.7050		
0.4226	0.7334	0.7455		
0.4258	0.7619	0.7619		
0.4253	0.7876	0.7575		
0.4166	0.8370	0.7916		
0.3832	0.9814	0.9526		

Zudkevitch, David - Lindrud, Mark - Chu, Yi-Zhi,
Vapor-Liquid Equilibria for Ethanol + Hept-1-yne and
Butyric Acid + Butyric Anhydride, Journal of Chemical &
Engineering Data. 44 (1999) 393-397.
doi:10.1021/je980210f

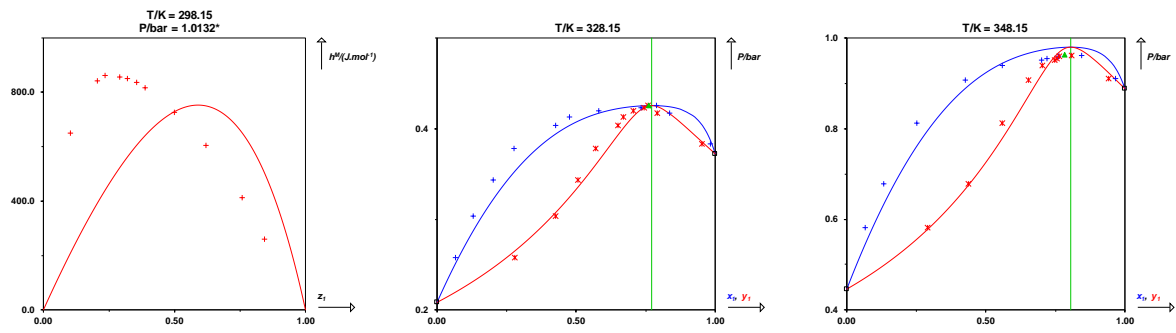
T / K = 348.15		
P / bar	x_1	y_1
0.5811	0.0670	0.2915
0.6783	0.1319	0.4357
0.8126	0.2506	0.5603
0.9069	0.4248	0.6527
0.9392	0.5576	0.7038
0.9506	0.6998	0.7469
0.9546	0.7201	0.7542
0.9594	0.7617	0.7631
0.9626	0.7830	0.7830
0.9614	0.8439	0.8069
0.9107	0.9658	0.9398

Enthalpy of mixing

Letcher, Trevor M. - Schoonbaert, Fabienne E.Z. - Bean,
Bruce, The molar excess enthalpies and volumes of 1-
alkyne + methanol and + ethanol mixtures at 298.15 K,
Fluid Phase Equilibria. 61 (1990) 111-119.
doi:10.1016/0378-3812(90)90008-B

T / K = 298.15
P / bar = UNKNOWN (1.0132)

SA-HD systems (BAC = 7)



ETHANOL (1) + CHLOROFORM (2)

CAS	64-17-5	67-66-3
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	HEDRZPFGACZZDS-UHFFFAOYSA-N
T_c / K	514.00	536.40
P_c / bar	61.37	54.72
ω	0.644	0.222

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 74.21$$

$$B/\text{MPa} = -28.84$$

Deviations

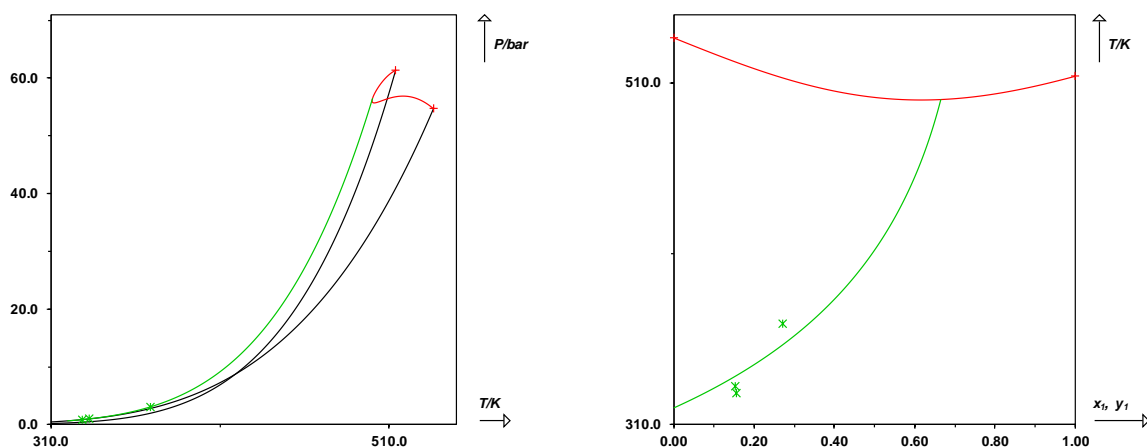
$$\text{MAPE on } x = 21 \%$$

$$\text{MAPE on } y = 10 \%$$

$$\text{MAPE on } x_{\text{az}} = 21 \%$$

$$\text{MAPE on } P_{\text{az}} = 4.0 \%$$

$$\text{MAPE on } h^M = 200 \%$$



Isothermal phase equilibrium data			0.4867	0.6702	0.3286
-----			0.5220	0.5985	0.2857
-----			0.5385	0.5561	0.2660
Scatchard, George - Raymond, C. L., Vapor—Liquid Equilibrium. II. Chloroform—Ethanol Mixtures at 35, 45 and 55°, Journal of the American Chemical Society. 60 (1938) 1278-1287. doi:10.1021/ja01273a002			0.5608	0.4860	0.2397
T / K =	308.15		0.5670	0.4595	0.2297
P / bar	x ₁	y ₁	0.5851	0.3717	0.2046
0.1398	0.9938	0.9746	0.5975	0.2852	0.1809
0.1484	0.9759	0.9009	0.6074	0.1794	0.1484
0.1515	0.9703	0.8790	0.6077	0.1148	0.1217
0.1647	0.9458	0.7846	0.6060	0.0900	0.1067
0.1678	0.9406	0.7657	0.6053	0.0875	0.1054
0.1977	0.8891	0.6115	0.6050	0.0837	0.1026
0.2368	0.8270	0.4696	0.5979	0.0443	0.0681
0.2742	0.7639	0.3793	0.5938	0.0323	0.0546
0.3001	0.7127	0.3253	0.5907	0.0242	0.0421
0.3056	0.6986	0.3130	0.5865	0.0134	0.0273
0.3153	0.6773	0.2991	Roeck, H. - Schroeder, W., Beitrag zur Kenntnis des Konzentrationsverlaufs thermodynamischer Mischungsfunktionen, Z. Phys. Chem. NF. 9 (1956) 277-284.		
0.3378	0.6155	0.2630	T / K =	328.15	
0.3404	0.6078	0.2588	P / bar	x ₁	y ₁
0.3568	0.5616	0.2354	0.3946	0.9790	0.9250
0.3654	0.5173	0.2203	0.4913	0.8940	0.6790
0.3892	0.3815	0.1819	0.5502	0.8400	0.5720
0.3959	0.3217	0.1673	0.6062	0.7890	0.4870
0.4040	0.2254	0.1446	0.6533	0.7410	0.4280
0.4072	0.1735	0.1302	0.6931	0.6970	0.3840
0.4068	0.1577	0.1248	0.7215	0.6570	0.3530
0.4083	0.1517	0.1217	0.7495	0.6150	0.3300
0.4080	0.0685	0.0839	Bourrelly, Viviane - Chevalier, Jean-Louis, Appareil pour la détermination rapide des équilibres isothermes liquide-vapeur, Journal de Chimie Physique. 65 (1968) 1561-1564. doi:10.1051/jcp/1968651561		
0.4065	0.0440	0.0637	T / K =	328.15	
0.4055	0.0414	0.0615	P / bar	x ₁	y ₁
0.4049	0.0400	0.0597	0.3986	0.9750	0.9090
0.4052	0.0384	0.0586	0.4380	0.9410	0.8040
Scatchard, George - Raymond, C. L., Vapor—Liquid Equilibrium. II. Chloroform—Ethanol Mixtures at 35, 45 and 55°, Journal of the American Chemical Society. 60 (1938) 1278-1287. doi:10.1021/ja01273a002			0.4806	0.9080	0.7040
T / K =	318.15		0.5633	0.8400	0.5640
P / bar	x ₁	y ₁	0.6046	0.8080	0.5000
0.2413	0.9843	0.9400	0.6173	0.7870	0.4790
0.2435	0.9811	0.9284	0.7033	0.6920	0.3760
0.2661	0.9524	0.8283	0.7466	0.6300	0.3380
0.2859	0.9288	0.7533	0.7559	0.6030	0.3200
0.3332	0.8740	0.6026	0.7753	0.5750	0.3070
0.3974	0.8003	0.4634	0.7919	0.5380	0.2890
0.3995	0.7989	0.4605	0.8006	0.5170	0.2800
0.4395	0.7431	0.3940	0.8113	0.4900	0.2700
0.4742	0.6884	0.3443			

SA-HD systems (BAC = 7)

0.8173	0.4830	0.2640		0.4000	0.9760	0.9095
0.8499	0.3400	0.2160		0.4266	0.9510	0.8350
0.8599	0.3050	0.2070		0.4533	0.9275	0.7610
0.8673	0.2340	0.1810		0.5066	0.8825	0.6520
0.8706	0.1850	0.1650		0.5600	0.8375	0.5540
0.8713	0.1740	0.1590		0.6133	0.7900	0.4870
0.8719	0.1560	0.1520		0.6666	0.7340	0.4110
0.8719	0.1540	0.1540	AZEO	0.7199	0.6660	0.3670
0.8686	0.1010	0.1240		0.7733	0.5760	0.3110
0.8626	0.0720	0.1000		0.8266	0.4195	0.2550
0.8506	0.0600	0.0900		0.8650	0.0830	0.1110
0.8359	0.0330	0.0620		0.8567	0.0510	0.0780

Scatchard, George - Raymond, C. L., Vapor—Liquid Equilibrium. II. Chloroform—Ethanol Mixtures at 35, 45 and 55°, Journal of the American Chemical Society. 60 (1938) 1278-1287. doi:10.1021/ja01273a002

T / K = 328.15

P / bar	x ₁	y ₁
0.4085	0.9669	0.8838
0.4532	0.9288	0.7698
0.4625	0.9198	0.7467
0.4893	0.8971	0.6877
0.5438	0.8521	0.5965
0.5880	0.8131	0.5205
0.6258	0.7799	0.4729
0.6783	0.7194	0.4058
0.7247	0.6588	0.3593
0.7276	0.6555	0.3581
0.7469	0.6233	0.3359
0.7556	0.6096	0.3280
0.7586	0.6035	0.3240
0.7986	0.5206	0.2839
0.8315	0.4270	0.2473
0.8428	0.3789	0.2361
0.8553	0.3149	0.2143
0.8623	0.2731	0.1990
0.8679	0.2236	0.1819
0.8707	0.1610	0.1583
0.8671	0.0963	0.1202
0.8589	0.0570	0.0850
0.8357	0.0348	0.0592

Hala, E. - Fried, V. - Pick, J. - Vilim, O., Liquid-vapor equilibria. VII. Calculation of liquid-vapor equilibria in two-component systems from isothermal p-x curves, Chem. Listy. 47 (1953) 1423-1427.

T / K = 328.15

P / bar	x ₁	y ₁
0.3836	0.9900	0.9615
0.3866	0.9872	0.9532

0.8485	0.0325	0.0600
0.8319	0.0100	0.0200

Isobaric phase equilibrium data

Orchillés, A. Vicent - Miguel, Pablo J. - Vercher, Ernesto - Martínez-Andreu, Antoni, Isobaric Vapor–Liquid and Liquid–Liquid Equilibria for Chloroform + Ethanol + 1-Ethyl-3-methylimidazolium Trifluoromethanesulfonate at 100 kPa, Journal of Chemical & Engineering Data. 53 (2008) 2642-2648. doi:10.1021/jc800548t

P / bar = 1.0000

T / K	x ₁	y ₁	
350.29	0.9840	0.9510	
349.54	0.9710	0.9110	
348.30	0.9470	0.8490	
347.13	0.9260	0.7920	
345.70	0.8980	0.7320	
344.13	0.8620	0.6540	
342.39	0.8220	0.5850	
340.48	0.7740	0.5120	
338.66	0.7160	0.4470	
337.04	0.6530	0.3910	
335.84	0.6020	0.3540	
334.92	0.5430	0.3160	
334.29	0.4950	0.2890	
333.75	0.4500	0.2680	
333.35	0.4090	0.2510	
333.03	0.3680	0.2350	
332.78	0.3260	0.2180	
332.59	0.2910	0.2060	
332.49	0.2650	0.1970	
332.34	0.2310	0.1850	
332.20	0.1520	0.1520	AZEO
332.20	0.1400	0.1460	
332.27	0.1110	0.1310	
332.37	0.0890	0.1150	

SA-HD systems (BAC = 7)

332.53 0.0680 0.0980
 332.77 0.0490 0.0740
 333.07 0.0300 0.0520
 333.44 0.0150 0.0290

370.78 0.0372 0.0645
 371.74 0.0077 0.0136

Chen, Geng-Hua - Wang, Qi - Ma, Zhong-Min - Yan, Xin-Huan - Han, Shi-Jun, Phase equilibria at superatmospheric pressures for systems containing halohydrocarbon, aromatic hydrocarbon, and alcohol, Journal of Chemical & Engineering Data. 40 (1995) 361-366. doi:10.1021/je00018a003

P / bar = 3.025

T / K	x ₁	y ₁
381.62	0.9936	0.9864
380.48	0.9617	0.9134
380.11	0.9525	0.8945
379.45	0.9391	0.8676
379.03	0.9275	0.8458
378.16	0.9090	0.8126
377.39	0.8892	0.7712
376.58	0.8654	0.7321
375.72	0.8412	0.6988
374.70	0.8078	0.6528
373.68	0.7690	0.6086
372.97	0.7369	0.5753
372.66	0.7103	0.5553
372.10	0.6828	0.5319
371.66	0.6587	0.5088
371.16	0.6371	0.4887
370.71	0.6000	0.4595
370.69	0.5760	0.4500
370.27	0.5555	0.4264
370.05	0.5280	0.4187
369.93	0.5126	0.3999
369.72	0.4818	0.3840
368.91	0.3705	0.3215
368.88	0.3378	0.3073
368.70	0.3110	0.2914
368.67	0.2887	0.2811
368.80	0.2701	0.2700
368.80	0.2700	0.2700
368.76	0.2319	0.2466
368.78	0.2059	0.2277
368.86	0.1961	0.2209
368.88	0.1911	0.2200
369.20	0.1508	0.1887
369.23	0.1348	0.1731
369.49	0.1119	0.1545
369.66	0.0858	0.1266
370.43	0.0537	0.0879

AZEO

Enthalpy of mixing

Nagata, I. - Kawamura, Y. - Asano, H. - Fujiwara, K. - Ogasawara, Y., Excess Enthalpies for Binary Mixtures of Chloroform with Alcohols, Z. Phys. Chem. Leipzig. 259 (1978) 1109-1116.

T / K = 298.15

**P / bar = UNKNOWN
 (1.0132)**

h ^M / J.mol ⁻¹	x ₁
-45.10	0.9919
-106.70	0.9802
-257.40	0.9485
-369.20	0.9198
-532.10	0.8614
-605.70	0.8101
-622.60	0.7707
-613.50	0.7362
-595.20	0.7099
-526.70	0.6541
-420.30	0.5960
-276.90	0.5307
-185.30	0.4902
-70.90	0.4406
-13.40	0.4146
29.60	0.3946
115.90	0.3530
232.10	0.2897
302.20	0.2442
353.40	0.1963
371.40	0.1683
377.80	0.1425
377.60	0.1233
360.30	0.0930
342.10	0.0786
317.90	0.0626
247.00	0.0410
161.70	0.0234
80.70	0.0105

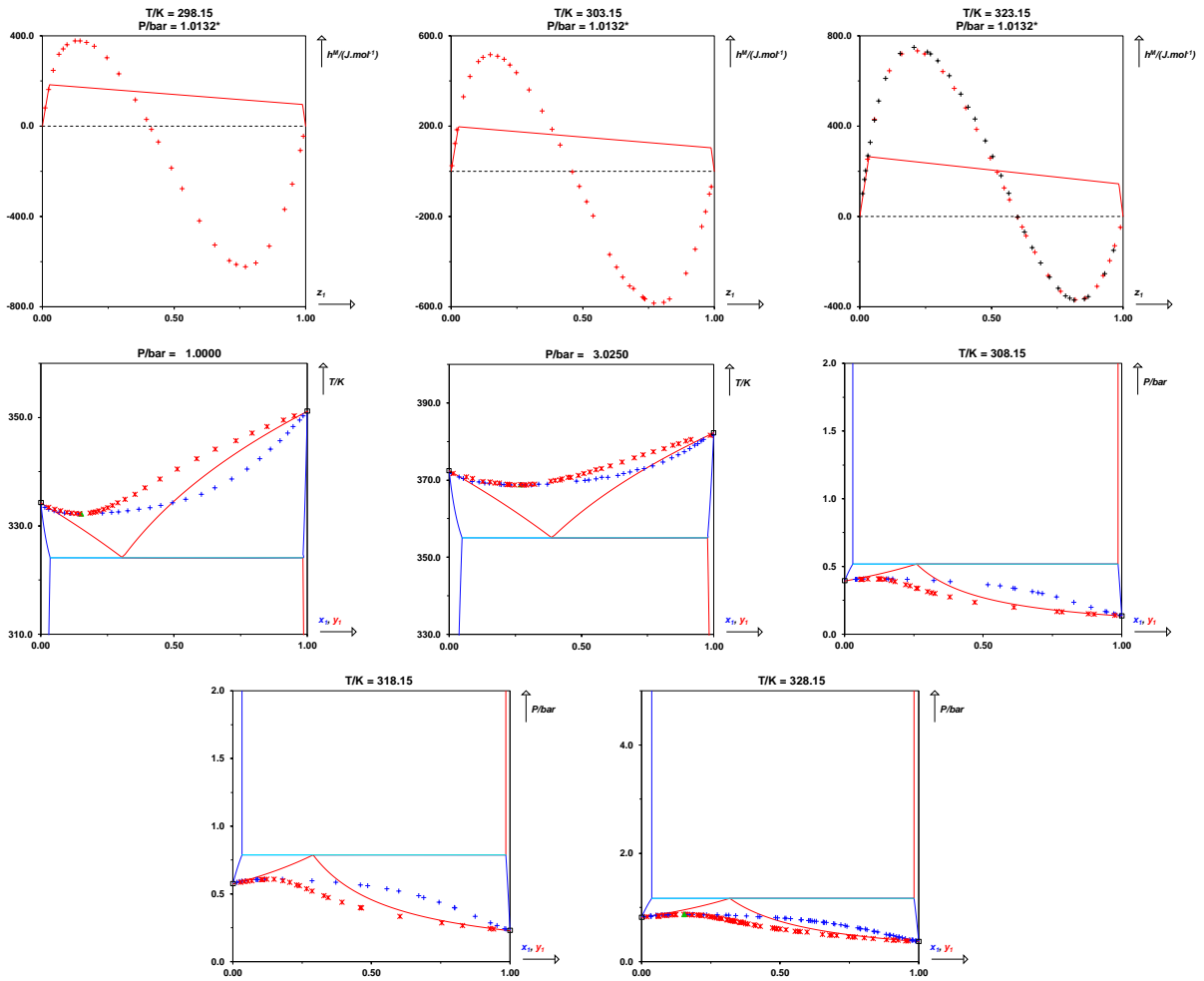
Shatas, Joseph P. - Abbott, Michael M. - Van Ness, Hendrick C., Excess thermodynamic functions for ternary systems. II. Chloroform-ethanol-n-heptane at 50°C, Journal of Chemical & Engineering Data. 20 (1975) 406-409. doi:10.1021/je60067a020

T / K = 303.15

SA-HD systems (BAC = 7)

180.20	0.5363
264.60	0.5040
335.50	0.4766
432.20	0.4368
484.40	0.4117
542.60	0.3830
623.50	0.3395
688.80	0.2959
720.10	0.2677
727.90	0.2560
749.20	0.2049
721.80	0.1535
610.90	0.0982
512.00	0.0719
426.10	0.0547
328.30	0.0391
268.90	0.0308
203.30	0.0225
163.50	0.0178
100.80	0.0107

SA-HD systems (BAC = 7)



CHLOROFORM (1) + ACETIC ACID (2)

CAS	67-66-3	64-19-7
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	QTBSBXVTEAMEQO-UHFFFAOYSA-N
T_c / K	536.40	591.95
P_c / bar	54.72	57.86
ω	0.222	0.467

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 67.73$$

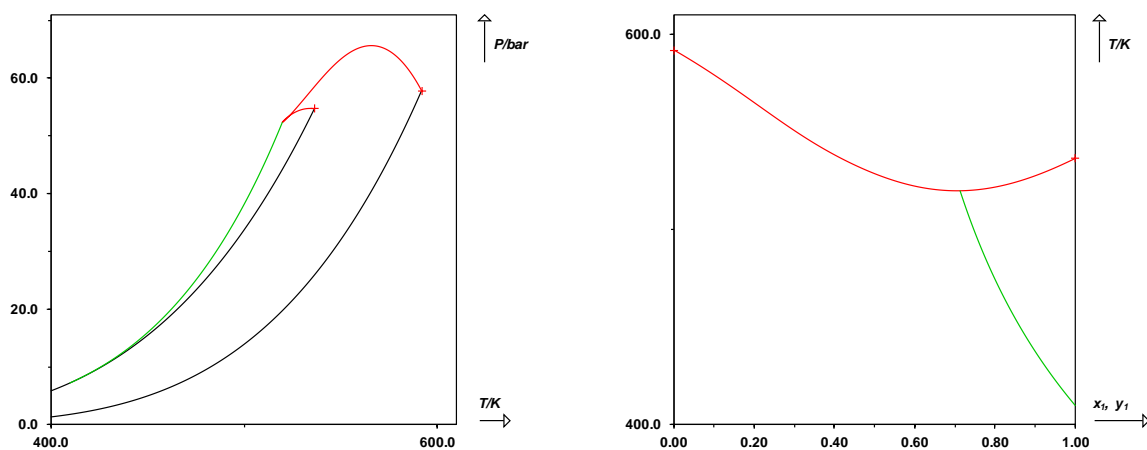
$$B/\text{MPa} = -82.98$$

Deviations

$$\text{MAPE on } x = 16\%$$

$$\text{MAPE on } y = 23\%$$

$$\text{MAPE on } h^M = 4.8\%$$



Isothermal phase equilibrium data

Campbell, A. N. - Kartzmark, E. M. - Gieskes, J. M. T. M., Vapor-Liquid Equilibria, Densities, And Refractivities In The System Acetic Acid – Chloroform – Water At 25 °C, Canadian Journal of Chemistry. 41 (1963) 407-429. doi:10.1139/v63-059

T / K = 298.15

P / bar	x ₁	y ₁
0.0619	0.0851	0.5236
0.0684	0.1068	0.5875
0.0781	0.1338	0.6543
0.1032	0.2087	0.7725
0.1247	0.2816	0.8274
0.1356	0.3136	0.8458
0.1881	0.5259	0.9272
0.2313	0.7463	0.9648

Isobaric phase equilibrium data

Conti, J. J. - Othmer, D. F. - Gilmont, Roger, Composition of Vapors from Boiling Binary Solutions. Systems Containing Formic Acid, Acetic Acid, Water, and Chloroform., Journal of Chemical & Engineering Data. 5 (1960) 301-307. doi:10.1021/je60007a019

P / bar = 1.013

T / K	x ₁	y ₁
374.45	0.0810	0.3380
368.85	0.1172	0.4515
368.55	0.1222	0.4568
361.95	0.1863	0.5785
354.55	0.2814	0.7061
347.55	0.4008	0.8058
343.65	0.5062	0.8572
343.05	0.5256	0.8802
340.95	0.6127	0.9088
338.05	0.7507	0.9428

Campbell, A. N. - Gieskes, J. M. T. M., The Isobaric Boiling Points Of The System: Acetic Acid – Chloroform – Water At A Pressure Of 760 Mm Hg, Canadian Journal of Chemistry. 42 (1964) 186-189. doi:10.1139/v64-032

P / bar = 1.013

T / K	x ₁	y ₁
386.85	0.0071	0.0699
379.15	0.0474	0.2213
369.95	0.0994	0.4383
366.65	0.1205	0.5064
354.95	0.2630	0.7019
354.65	0.2751	0.6962

344.15	0.4808	0.8595
342.95	0.5109	0.8716
336.45	0.8340	0.9687
334.65	0.9764	0.9960

Enthalpy of mixing

Abramov, E.V. - Mirzayan, A.S. - Fedorova, V.I., Heats of formation of ternary systems. 1. Acetic acid-pyridine-chloroform system, Izv. Akad. Nauk Kaz. SSR Ser. Khim. 22 (1972) 26-32.

T / K = 293.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
-212.00	0.0930
-222.00	0.1000
-402.00	0.2040
-531.00	0.2990
-541.00	0.3000
-605.00	0.3930
-611.00	0.3970
-632.00	0.4900
-630.00	0.4950
-626.00	0.5000
-619.00	0.5310
-582.00	0.6030
-531.00	0.6670
-441.00	0.7560
-354.00	0.8110
-213.00	0.8900

Abramov, E.V. - Mirzayan, A.S. - Fedorova, V.I., Heats of formation of ternary systems. 1. Acetic acid-pyridine-chloroform system, Izv. Akad. Nauk Kaz. SSR Ser. Khim. 22 (1972) 26-32.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
-204.00	0.1020
-370.00	0.2020
-516.00	0.3000
-586.00	0.4000
-588.00	0.4030
-599.00	0.5000
-563.00	0.6000
-554.00	0.6110
-480.00	0.6920
-476.00	0.7000
-358.00	0.7980
-355.00	0.8000

-203.00	0.8830
-175.00	0.8980

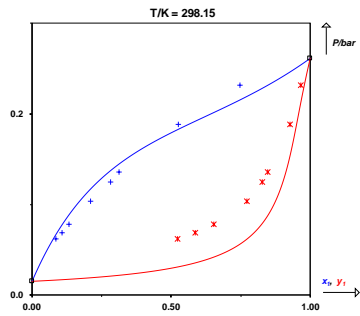
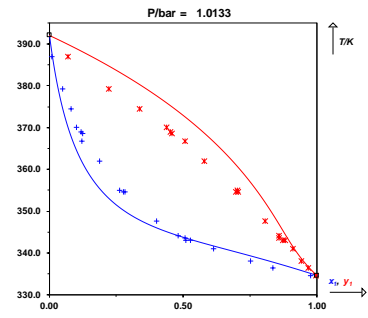
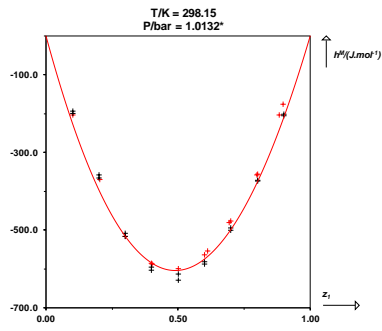
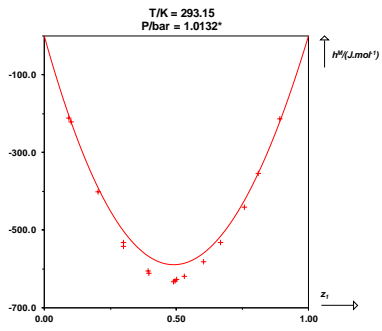
Ratkovics, F., Adiabatic calorimeter for determining heats of mixing, *Magy. Kem. Foly.* 77 (1971) 499-502.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
-200.13	0.1000
-193.43	0.1000
-357.13	0.2000
-366.35	0.2000
-515.81	0.3000
-508.28	0.3000
-594.53	0.4000
-603.74	0.4000
-628.86	0.5000
-612.11	0.5000
-586.99	0.6000
-581.97	0.6000
-494.88	0.7000
-499.49	0.7000
-373.04	0.8000
-371.37	0.8000
-200.97	0.9000
-205.99	0.9000

SA-HD systems (BAC = 7)



ISOPROPANOL (1) + CHLOROFORM (2)

CAS	67-63-0	67-66-3
InChiKey	KFZMGEQAYNKOFK-UHFFFAOYSA-N	HEDRZPFGACZZDS-UHFFFAOYSA-N
T_c / K	508.30	536.40
P_c / bar	47.65	54.72
ω	0.663	0.222

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 53.17$$

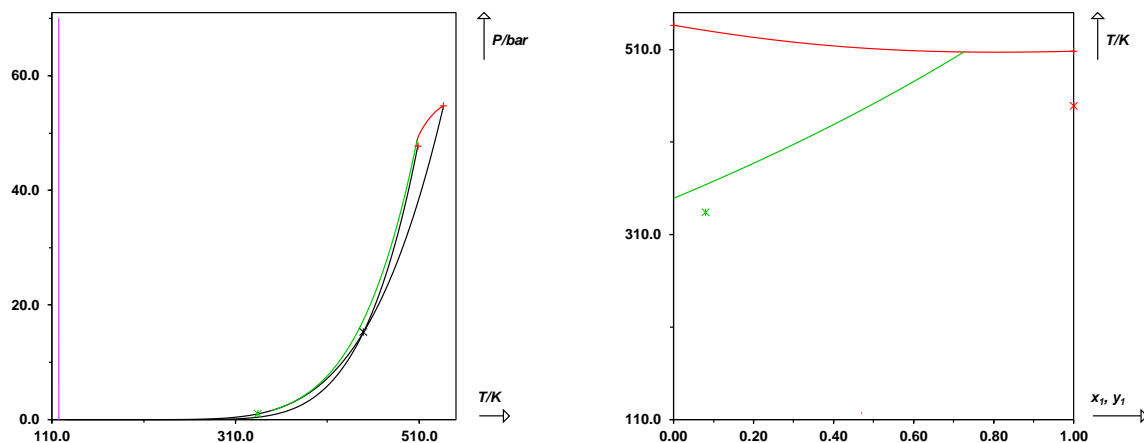
$$B/\text{MPa} = 46.46$$

Deviations

$$\text{MAPE on } x = 14 \%$$

$$\text{MAPE on } y = 13 \%$$

$$\text{MAPE on } h^M = 68 \%$$



Isothermal phase equilibrium data

Nagata, Isamu, Vapor-liquid equilibria for the ternary system 2-propanol-chloroform-benzene at 50°C, Journal of Chemical & Engineering Data. 30 (1985) 80-82. doi:10.1021/je00039a027

T / K =	323.15	
P / bar	x ₁	y ₁
0.3308	0.9010	0.6580
0.3976	0.8240	0.5080
0.4726	0.7130	0.3830
0.5276	0.6200	0.3060
0.5789	0.5110	0.2430
0.6125	0.4110	0.1990
0.6240	0.3770	0.1880
0.6629	0.2300	0.1350
0.6786	0.1640	0.1050
0.6887	0.0610	0.0530
0.6909	0.0470	0.0430

Isobaric phase equilibrium data

Hanumantharao, G. - Subbarao, B. V., ISOBARIC VAPOR-LIQUID-EQUILIBRIA-CHLOROFORM-ISOPROPANOL, TERTIARY BUTANOL-TOLUENE AND TERTIARY BUTANOL-TRICHLOROETHYLENE SYSTEMS, INDIAN JOURNAL OF TECHNOLOGY. 12 (1974) 292-295.

P / bar =	1.013		
T / K	x ₁	y ₁	
354.15	0.9700	0.9090	
353.15	0.9480	0.8700	
351.65	0.9090	0.7830	
348.85	0.8650	0.6660	
347.15	0.8080	0.5800	
345.75	0.7680	0.5150	
343.95	0.6900	0.4290	
341.65	0.6100	0.3500	
340.35	0.5450	0.2900	
339.25	0.4950	0.2550	
338.65	0.4500	0.2450	
337.75	0.3900	0.2200	
336.65	0.3150	0.1890	
335.95	0.2700	0.1700	
335.15	0.2100	0.1500	
334.85	0.1850	0.1350	
334.35	0.1300	0.1100	
333.95	0.0790	0.0790	AZEO
334.05	0.0200	0.0400	

Enthalpy of mixing

Nagata, I. - Kawamura, Y. - Asano, H. - Fujiwara, K. - Ogasawara, Y., Excess Enthalpies for Binary Mixtures of Chloroform with Alcohols, Z. Phys. Chem. Leipzig. 259 (1978) 1109-1116.

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-49.40	0.9844	
-130.80	0.9479	
-171.40	0.9100	
-177.10	0.8843	
-172.60	0.8577	
-129.30	0.8121	
-63.60	0.7682	
22.50	0.7222	
201.60	0.6375	
392.50	0.5472	
456.10	0.5171	
556.40	0.4644	
678.30	0.3852	
739.70	0.3291	
763.70	0.2953	
777.20	0.2604	
778.90	0.2320	
772.00	0.2082	
746.30	0.1736	
675.60	0.1285	
550.90	0.0853	
258.80	0.0304	

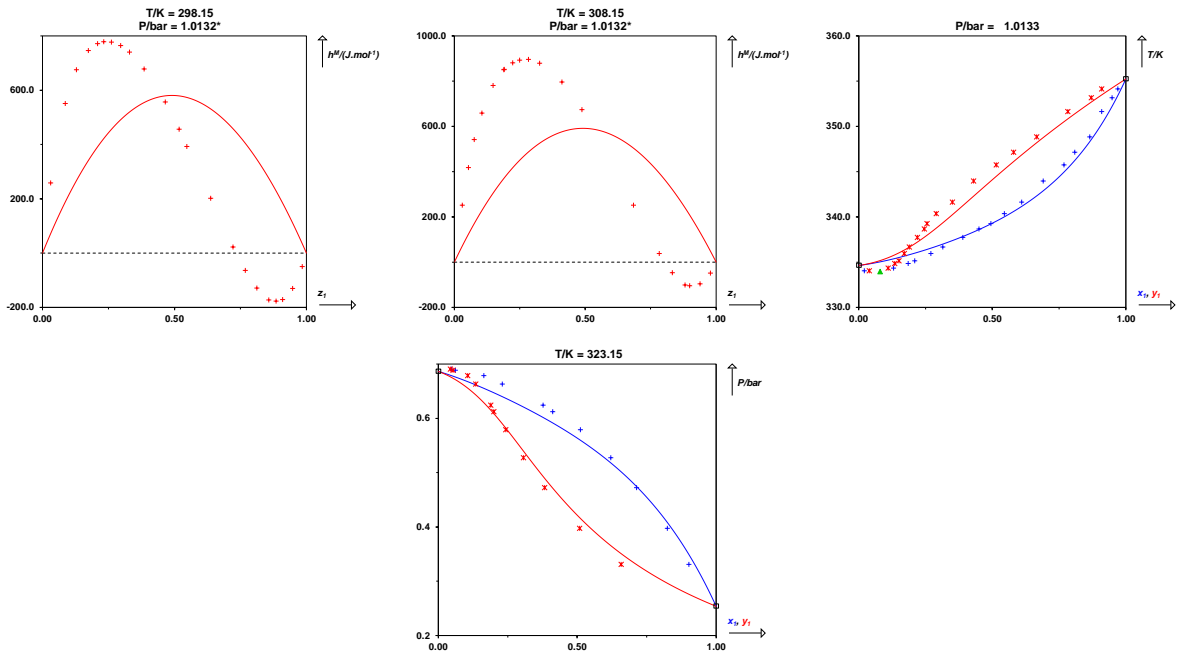
Nagata, I. - Kawamura, Y. - Asano, H. - Fujiwara, K. - Ogasawara, Y., Excess Enthalpies for Binary Mixtures of Chloroform with Alcohols, Z. Phys. Chem. Leipzig. 259 (1978) 1109-1116.

T / K =	308.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-48.60	0.9777	
-95.60	0.9379	
-104.60	0.8980	
-100.40	0.8806	
-46.90	0.8322	
38.00	0.7826	
252.30	0.6833	
674.50	0.4875	
796.90	0.4101	

SA-HD systems (BAC = 7)

879.60	0.3258
895.90	0.2832
893.60	0.2495
881.50	0.2227
851.30	0.1908
851.00	0.1884
780.60	0.1474
658.10	0.1043
541.40	0.0757
418.50	0.0532
251.90	0.0299

SA-HD systems (BAC = 7)



ISOPROPANOL (1) + TRICHLOROETHYLENE (2)

CAS	67-63-0	79-01-6
InChiKey	KFZMGEQAYNKOFK-UHFFFAOYSA-N	XSTXAVWGXDKEL-UHFFFAOYSA-N
T_c / K	508.30	571.00
P_c / bar	47.65	49.10
ω	0.663	0.217

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 76.65$$

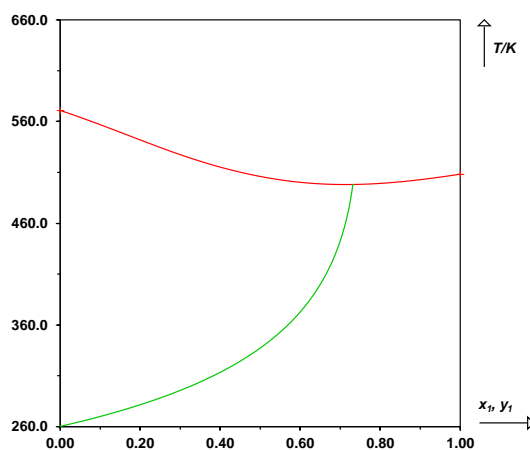
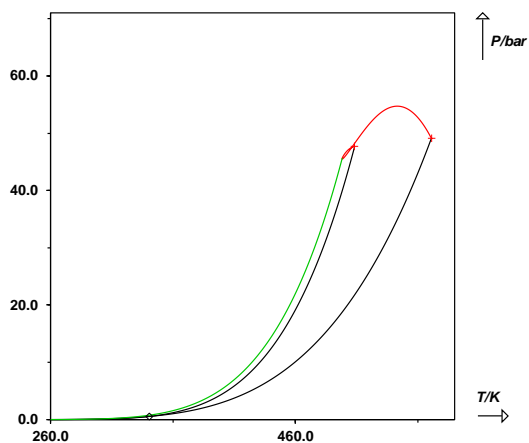
$$B/\text{MPa} = -45.18$$

Deviations

$$\text{MAPE on } x = 18 \%$$

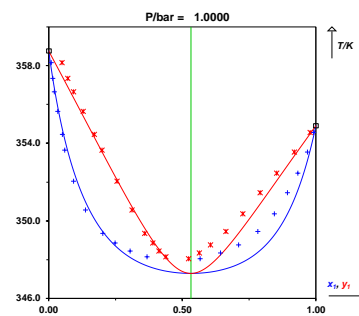
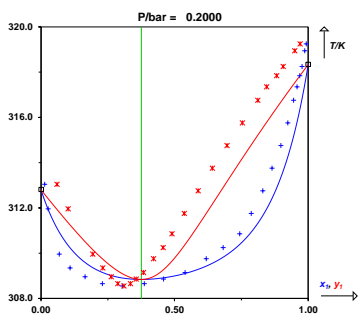
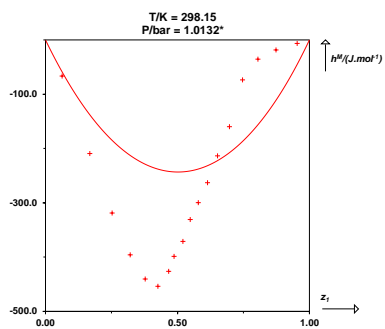
$$\text{MAPE on } y = 14 \%$$

$$\text{MAPE on } h^M = 50 \%$$



-----			348.85	0.2480	0.3890
Isobaric phase equilibrium data			348.45	0.3050	0.4130
-----			348.15	0.3680	0.4380
Aucejo, Antonio - Gonzalez-Alfaro, Vicenta - Monton, Juan B. - Vazquez, M. Isabel, Isobaric Vapor-Liquid Equilibria of Trichloroethylene with 1-Propanol and 2-Propanol at 20 and 100 kPa, Journal of Chemical & Engineering Data. 40 (1995) 332-335. doi:10.1021/je00017a073			348.05	0.5670	0.5230
P / bar =	0.2000		348.35	0.6430	0.5630
T / K	x ₁	y ₁	348.75	0.7100	0.6060
313.05	0.0130	0.0590	349.45	0.7820	0.6630
311.95	0.0260	0.1020	350.35	0.8440	0.7270
309.95	0.0680	0.1940	351.45	0.8940	0.7910
309.35	0.1090	0.2310	352.45	0.9320	0.8530
308.95	0.1640	0.2620	353.55	0.9680	0.9200
308.65	0.2300	0.2870	354.55	0.9920	0.9790
308.55	0.3040	0.3100	-----		
308.65	0.3860	0.3340	Enthalpy of mixing		
308.85	0.4580	0.3560	-----		
309.15	0.5390	0.3830	Iloukhani, H. - Parsa, J.B., Excess Molar Enthalpies of Binary Mixtures of Trichloroethylene with Six 2-Alkanols at 25°C, J. Solution Chem. 30 (2001) 425-433. doi:10.1023/A:1010396430848		
309.75	0.6190	0.4210	T / K = 298.15		
310.25	0.6810	0.4570	P / bar = UNKNOWN (1.0132)		
310.85	0.7440	0.4900	h ^M / J.mol ⁻¹	x ₁	
311.75	0.7870	0.5360	-66.80	0.0631	
312.75	0.8300	0.5880	-209.40	0.1680	
313.75	0.8650	0.6410	-318.60	0.2518	
314.75	0.8970	0.6960	-395.70	0.3203	
315.75	0.9230	0.7540	-440.20	0.3773	
316.75	0.9450	0.8120	-453.50	0.4254	
317.35	0.9580	0.8440	-426.20	0.4667	
317.85	0.9680	0.8820	-398.40	0.4872	
318.25	0.9770	0.9070	-371.50	0.5204	
318.95	0.9870	0.9490	-330.80	0.5480	
319.25	0.9930	0.9700	-299.50	0.5788	
Aucejo, Antonio - Gonzalez-Alfaro, Vicenta - Monton, Juan B. - Vazquez, M. Isabel, Isobaric Vapor-Liquid Equilibria of Trichloroethylene with 1-Propanol and 2-Propanol at 20 and 100 kPa, Journal of Chemical & Engineering Data. 40 (1995) 332-335. doi:10.1021/je00017a073			-263.00	0.6133	
P / bar =	1.0000		-213.30	0.6521	
T / K	x ₁	y ₁	-159.80	0.6961	
358.15	0.0090	0.0490	-73.80	0.7465	
357.35	0.0150	0.0710	-35.60	0.8048	
356.65	0.0210	0.0930	-18.60	0.8730	
355.65	0.0330	0.1290	-6.300	0.9537	
354.45	0.0510	0.1700			
353.65	0.0590	0.1990			
352.05	0.0920	0.2550			
350.55	0.1380	0.3120			
349.35	0.2020	0.3590			

SA-HD systems (BAC = 7)



1-PROPANOL (1) + TRICHLOROETHYLENE (2)

CAS	71-23-8	79-01-6
InChiKey	BDERNNFJNOPAEC-UHFFFAOYSA-N	XSTXAVWGXDKEL-UHFFFAOYSA-N
T_c / K	536.80	571.00
P_c / bar	51.69	49.10
ω	0.621	0.217

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 76.69$$

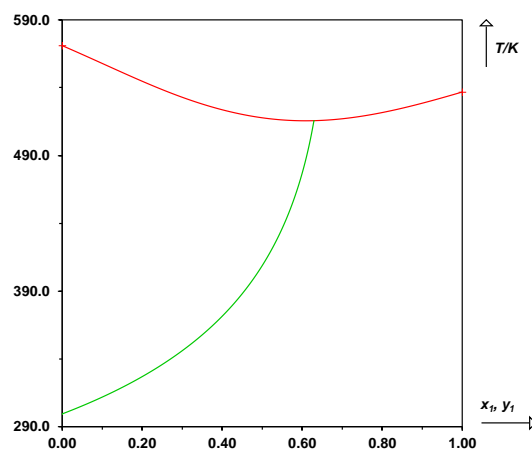
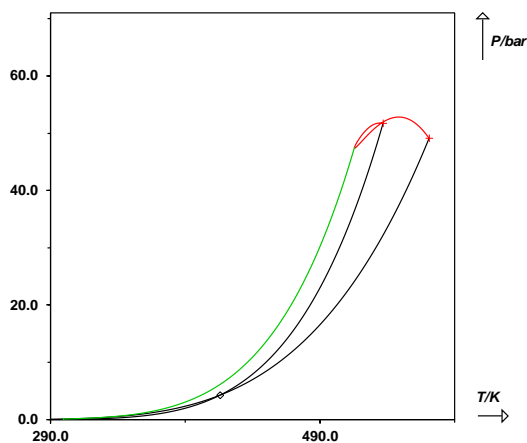
$$B/\text{MPa} = -50.93$$

Deviations

$$\text{MAPE on } x = 17\%$$

$$\text{MAPE on } y = 11\%$$

$$\text{MAPE on } h^M = 59\%$$



Isobaric phase equilibrium data			

Aucejo, Antonio - Gonzalez-Alfaro, Vicenta - Monton, Juan B. - Vazquez, M. Isabel, Isobaric Vapor-Liquid Equilibria of Trichloroethylene with 1-Propanol and 2-Propanol at 20 and 100 kPa, Journal of Chemical & Engineering Data. 40 (1995) 332-335. doi:10.1021/je00017a073			
P / bar =	0.2000		
T / K	x ₁	y ₁	
331.45	0.9890	0.9330	354.95
330.55	0.9810	0.8890	355.35
329.75	0.9730	0.8500	355.75
329.05	0.9640	0.8100	356.55
328.15	0.9510	0.7600	356.85
326.55	0.9330	0.6910	357.75
324.75	0.9100	0.6200	358.45
323.05	0.8810	0.5500	
321.55	0.8490	0.4930	
319.45	0.8130	0.4250	
317.65	0.7590	0.3710	
316.55	0.7110	0.3440	
315.15	0.6560	0.2970	
313.95	0.5650	0.2580	
313.15	0.4850	0.2340	
312.75	0.4200	0.2180	
312.35	0.3310	0.1990	
312.15	0.2490	0.1810	
312.35	0.0650	0.1190	
313.35	0.0180	0.0540	

Aucejo, Antonio - Gonzalez-Alfaro, Vicenta - Monton, Juan B. - Vazquez, M. Isabel, Isobaric Vapor-Liquid Equilibria of Trichloroethylene with 1-Propanol and 2-Propanol at 20 and 100 kPa, Journal of Chemical & Engineering Data. 40 (1995) 332-335. doi:10.1021/je00017a073

P / bar =	1.0000	
T / K	x ₁	y ₁
369.05	0.9910	0.9680
367.25	0.9670	0.8870
365.55	0.9400	0.8110
364.45	0.9200	0.7600
362.75	0.8860	0.6910
359.75	0.8040	0.5780
358.15	0.7490	0.5100
356.85	0.6860	0.4640
355.85	0.6170	0.4230
355.05	0.5320	0.3810
354.55	0.4590	0.3520
354.35	0.3850	0.3320
354.45	0.1890	0.2480

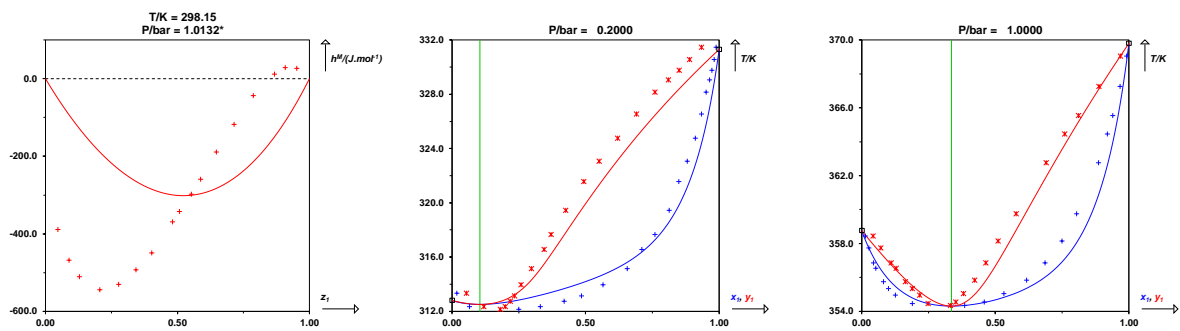
0.1260	0.2160
0.1000	0.1890
0.0810	0.1630
0.0530	0.1280
0.0440	0.1100
0.0260	0.0710
0.0140	0.0420

Enthalpy of mixing

Iloukhani, H., Excess Molar Enthalpies for Binary Mixtures with Trichloroethylene + Alkan-1-ols (C3-C8) at 298.15 K, Journal of Chemical & Engineering Data. 42 (1997) 802-804. doi:10.1021/je970024u

T / K = 298.15
P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
26.10	0.9514
28.60	0.9074
11.90	0.8672
-43.60	0.7870
-117.90	0.7139
-189.20	0.6474
-259.10	0.5872
-298.30	0.5529
-342.50	0.5073
-369.50	0.4816
-449.10	0.4028
-493.30	0.3427
-530.10	0.2776
-544.40	0.2062
-510.70	0.1281
-468.10	0.0892
-388.90	0.0467



CHLOROFORM (1) + 1-PROPANOL (2)

CAS	67-66-3	71-23-8
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	BDERNNFJNOPAEC-UHFFFAOYSA-N
T_c / K	536.40	536.80
P_c / bar	54.72	51.69
ω	0.222	0.621

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 61.09$$

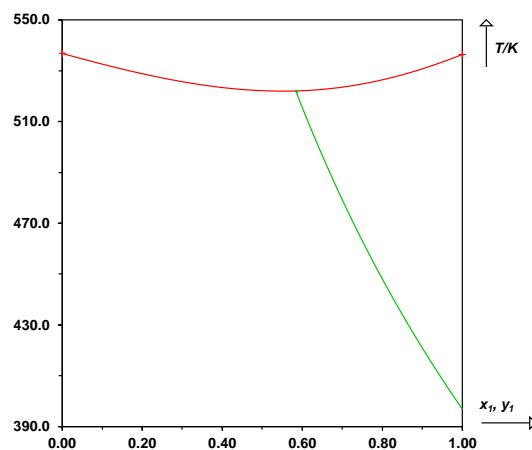
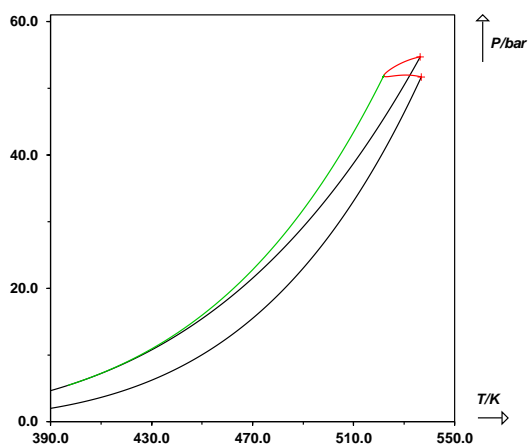
$$B/\text{MPa} = 23.01$$

Deviations

$$\text{MAPE on } x = 13 \%$$

$$\text{MAPE on } y = 12 \%$$

$$\text{MAPE on } h^M = 71 \%$$

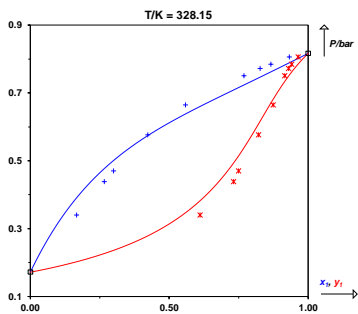
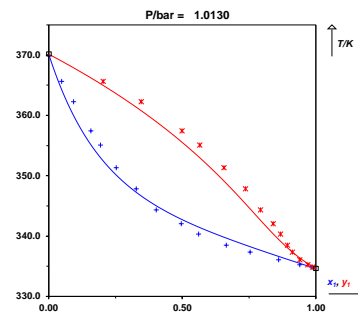
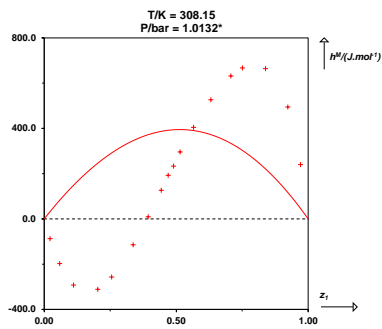
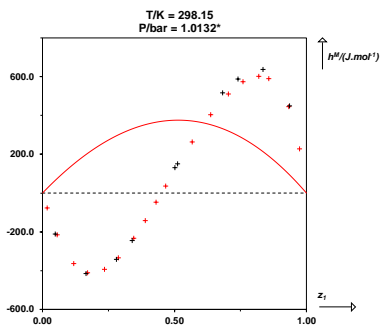


Isothermal phase equilibrium data			P / bar =	UNKNOWN (1.0132)
Nagata, Isamu, Isothermal (vapour + liquid) equilibria of propan-1-ol + acetonitrile and + trichloromethane and of (propan-1-ol + acetonitrile + trichloromethane), The Journal of Chemical Thermodynamics. 17 (1985) 1017-1022. doi:10.1016/0021-9614(85)90086-2			$h^M / \text{J.mol}^{-1}$	x_1
T / K =	328.15		-76.90	0.0171
P / bar	x_1	y_1	-214.60	0.0556
0.3396	0.1670	0.6110	-364.30	0.1184
0.4380	0.2660	0.7310	-411.50	0.1701
0.4698	0.3000	0.7490	-394.30	0.2351
0.5766	0.4230	0.8220	-334.50	0.2868
0.6645	0.5580	0.8740	-232.60	0.3453
0.7507	0.7690	0.9150	-141.80	0.3887
0.7719	0.8270	0.9300	-47.80	0.4306
0.7845	0.8660	0.9400	36.20	0.4668
0.8059	0.9320	0.9640	263.10	0.5667
			403.00	0.6369
			510.80	0.7037
			573.80	0.7601
			601.50	0.8190
			589.50	0.8569
			445.00	0.9326
			227.50	0.9739
Isobaric phase equilibrium data			Hirobe, H., Thermochemical studies, J. Fac. Sci. Univ. Tokyo Sect. 1. 1 (1926) 155-222.	
Wang Shouyu - Cai Shuxing, VLE Data for Chloroform - n-Propanol and its System Containing Salt, Huaxue Gongcheng. 22 (1994) 36-40.			T / K =	298.15
P / bar =	1.013		P / bar =	UNKNOWN (1.0132)
T / K	x_1	y_1	$h^M / \text{J.mol}^{-1}$	x_1
365.65	0.0480	0.2040	-211.85	0.0486
362.25	0.0930	0.3460	-415.33	0.1640
357.45	0.1570	0.4990	-342.06	0.2794
355.05	0.1940	0.5650	-244.51	0.3399
351.35	0.2530	0.6560	131.47	0.5011
347.85	0.3270	0.7360	151.56	0.5123
344.35	0.4030	0.7920	515.81	0.6823
342.05	0.4960	0.8400	586.99	0.7411
340.35	0.5610	0.8680	636.81	0.8347
338.45	0.6640	0.8940	449.66	0.9359
337.35	0.7530	0.9120		
336.05	0.8600	0.9390		
335.25	0.9400	0.9690		
334.85	0.9840	0.9870		
Enthalpy of mixing			Nagata, I. - Kawamura, Y. - Asano, H. - Fujiwara, K. - Ogasawara, Y., Excess Enthalpies for Binary Mixtures of Chloroform with Alcohols, Z. Phys. Chem. Leipzig. 259 (1978) 1109-1116.	
T / K =	298.15		T / K =	308.15
			P / bar =	UNKNOWN (1.0132)
			$h^M / \text{J.mol}^{-1}$	x_1
			-88.00	0.0226
			-197.90	0.0586
			-291.90	0.1103
			-311.30	0.2020
			-256.60	0.2552
			-113.80	0.3363

SA-HD systems (BAC = 7)

9.800	0.3935
126.40	0.4438
193.10	0.4698
233.50	0.4903
295.20	0.5147
404.20	0.5659
526.40	0.6314
631.50	0.7069
667.40	0.7507
664.00	0.8388
494.40	0.9223
239.60	0.9709

SA-HD systems (BAC = 7)



ETHYL FORMATE (1) + CHLOROFORM (2)

CAS	109-94-4	67-66-3
InChiKey	WBJINCZRDRDGAQ-UHFFFAOYSA-N	HEDRZPFGACZZDS-UHFFFAOYSA-N
T_c / K	508.40	536.40
P_c / bar	47.40	54.72
ω	0.285	0.222

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = -41.89$$

$$B/\text{MPa} = -103.6$$

Deviations

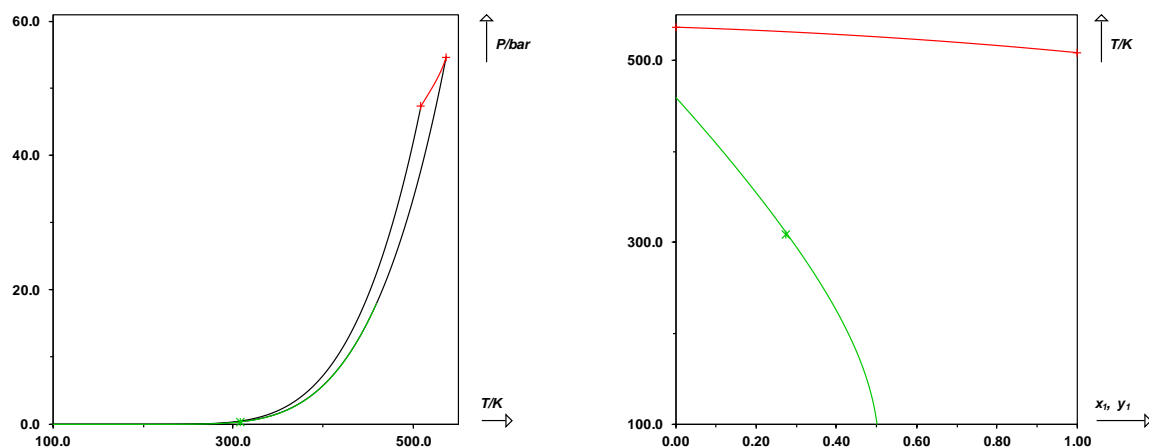
$$\text{MAPE on } x = 7.4 \%$$

$$\text{MAPE on } y = 7.0 \%$$

$$\text{MAPE on } x_{\text{az}} = 1.2 \%$$

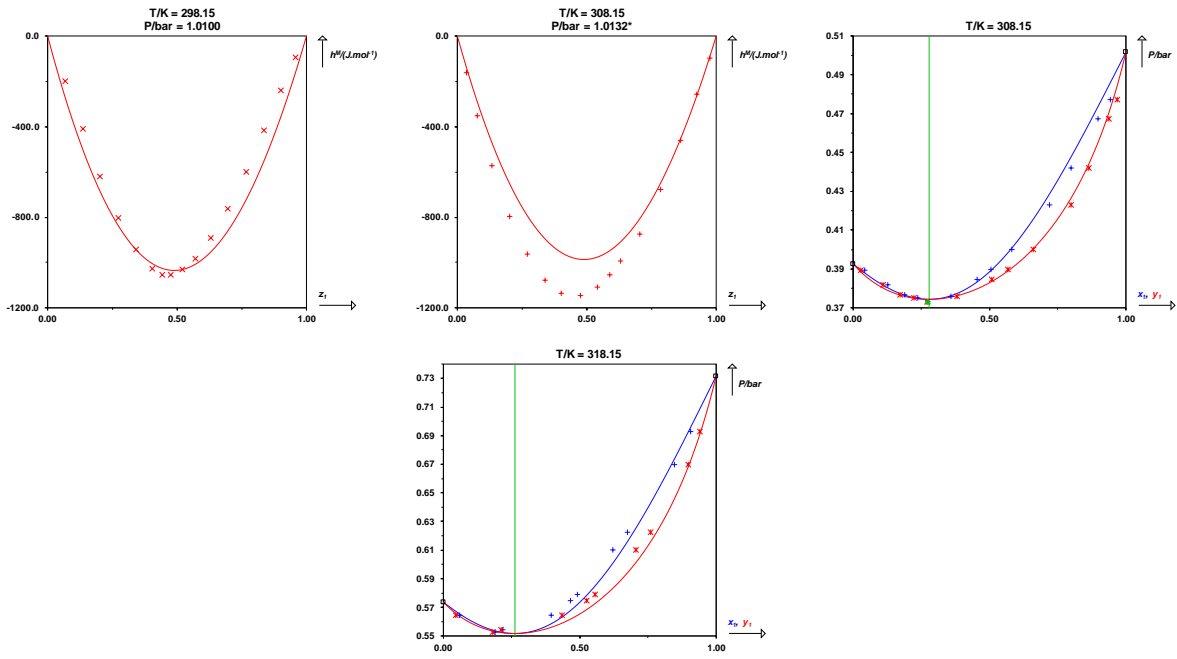
$$\text{MAPE on } P_{\text{az}} = 0.29 \%$$

$$\text{MAPE on } h^{\text{M}} = 14 \%$$



Isothermal phase equilibrium data			$h^M / \text{J.mol}^{-1}$	z_1
-----			-200.70	0.0689
-----			-411.20	0.1356
Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378- 3812(80)80008-2			-620.70	0.2004
T / K = 308.15			-804.40	0.2722
P / bar	x_1	y_1	-940.80	0.3419
0.3894	0.0410	0.0290	-1025.7	0.4045
0.3817	0.1280	0.1100	-1054.7	0.4415
0.3765	0.1890	0.1720	-1054.3	0.4769
0.3750	0.2360	0.2240	-1031.4	0.5198
0.3733	0.2730	0.2710	-982.80	0.5694
0.3733	0.2740	0.2740	-891.70	0.6309
0.3760	0.3570	0.3820	-762.80	0.6968
0.3848	0.4540	0.5080	-599.50	0.7665
0.3898	0.5050	0.5670	-416.30	0.8367
0.4001	0.5800	0.6590	-239.00	0.8999
0.4228	0.7210	0.7980	-93.20	0.9568
0.4418	0.8000	0.8640	Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378- 3812(80)80008-2	
0.4672	0.8970	0.9380	T / K = 308.15	
0.4773	0.9440	0.9680	P / bar = UNKNOWN (1.0132)	
Ohta, Tatsuhiko - Asano, Hisashi - Nagata, Isamu, Thermodynamic study of complex formation in four binary liquid mixtures containing chloroform, Fluid Phase Equilibria. 4 (1980) 105-114. doi:10.1016/0378- 3812(80)80008-2			$h^M / \text{J.mol}^{-1}$	x_1
T / K = 318.15			-162.00	0.0340
P / bar	x_1	y_1	-351.80	0.0770
0.5642	0.0580	0.0440	-573.80	0.1330
0.5526	0.1900	0.1790	-797.00	0.2010
0.5541	0.2160	0.2120	-963.90	0.2700
0.5646	0.3960	0.4350	-1077.8	0.3400
0.5748	0.4660	0.5250	-1136.1	0.4010
0.5788	0.4900	0.5560	-1147.4	0.4750
0.6102	0.6220	0.7050	-1109.7	0.5400
0.6227	0.6740	0.7580	-1054.4	0.5890
0.6698	0.8460	0.8980	-992.80	0.6300
0.6930	0.9050	0.9410	-873.30	0.7060
-----			-678.70	0.7850
Enthalpy of mixing			-460.20	0.8610
-----			-255.70	0.9260
Ortega, J., Excess enthalpy. Trichloromethane-ethyl methanoate system, Int. Data Ser. Sel. Data Mixtures Ser. A. 21 (1993)			-97.10	0.9740
T / K = 298.15				
P / bar = 1.010				

SA-HD systems (BAC = 7)



CHLOROFORM (1) + 1-BUTANOL (2)

CAS	67-66-3	71-36-3
InChiKey	HEDRZPFGACZZDS-UHFFFAOYSA-N	LRHPLDYGYMQRHN-UHFFFAOYSA-N
T_c / K	536.40	563.10
P_c / bar	54.72	44.14
ω	0.222	0.588

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 30.42$$

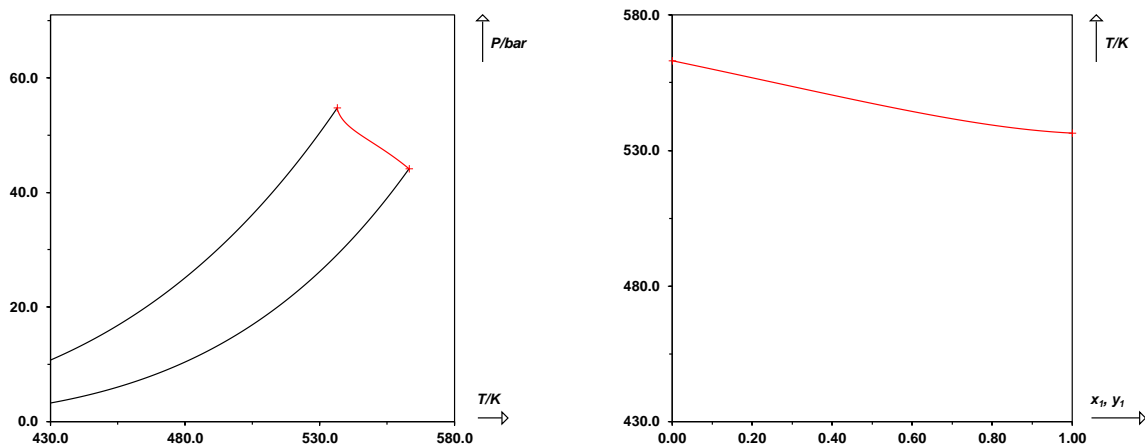
$$B/\text{MPa} = 31.22$$

Deviations

$$\text{MAPE on } x = 6.3 \%$$

$$\text{MAPE on } y = 5.1 \%$$

$$\text{MAPE on } h^M = 66 \%$$



-----			375.70	0.4539	0.8343
Isobaric phase equilibrium data			373.25	0.4895	0.8650
-----			370.13	0.5728	0.8967
Chen, Geng-Hua - Wang, Qi - Ma, Zhong-Min - Yan, Xin-Huan - Han, Shi-Jun, Phase equilibria at superatmospheric pressures for systems containing halohydrocarbon, aromatic hydrocarbon, and alcohol, Journal of Chemical & Engineering Data. 40 (1995) 361-366. doi:10.1021/je00018a003			367.67	0.6357	0.9151
P / bar = 1.050			365.94	0.7025	0.9329
T / K	x ₁	y ₁	363.50	0.7925	0.9580
390.62	0.0091	0.0449	362.03	0.8435	0.9653
388.96	0.0213	0.1255	360.93	0.8815	0.9763
387.43	0.0357	0.1801	Chen, Geng-Hua - Wang, Qi - Ma, Zhong-Min - Yan, Xin-Huan - Han, Shi-Jun, Phase equilibria at superatmospheric pressures for systems containing halohydrocarbon, aromatic hydrocarbon, and alcohol, Journal of Chemical & Engineering Data. 40 (1995) 361-366. doi:10.1021/je00018a003		
383.69	0.0612	0.3066	P / bar = 3.030		
380.17	0.0865	0.3937	T / K	x ₁	y ₁
376.14	0.1195	0.4974	421.35	0.0471	0.1560
370.37	0.1707	0.6171	421.05	0.0501	0.1709
365.64	0.2203	0.6899	420.29	0.0602	0.1970
361.90	0.2644	0.7575	418.27	0.0833	0.2583
357.72	0.3247	0.8065	415.33	0.1140	0.3422
354.43	0.3773	0.8499	412.51	0.1420	0.3981
351.34	0.4278	0.8767	409.16	0.1900	0.4901
349.62	0.4624	0.8909	408.39	0.2041	0.5163
347.67	0.5091	0.9166	407.12	0.2187	0.5462
343.31	0.6386	0.9405	406.10	0.2365	0.5756
341.13	0.6967	0.9461	404.14	0.2633	0.6087
340.09	0.7445	0.9497	399.76	0.3310	0.6834
339.67	0.7798	0.9608	397.69	0.3480	0.7111
339.36	0.7981	0.9633	396.56	0.3723	0.7249
339.09	0.8113	0.9635	394.10	0.4275	0.7630
337.54	0.8755	0.9762	389.90	0.5019	0.8226
335.56	0.9804	0.9921	385.93	0.5879	0.8676
Chen, Geng-Hua - Wang, Qi - Ma, Zhong-Min - Yan, Xin-Huan - Han, Shi-Jun, Phase equilibria at superatmospheric pressures for systems containing halohydrocarbon, aromatic hydrocarbon, and alcohol, Journal of Chemical & Engineering Data. 40 (1995) 361-366. doi:10.1021/je00018a003			382.06	0.6789	0.9096
P / bar = 2.050			379.32	0.7705	0.9419
T / K	x ₁	y ₁	376.85	0.8548	0.9617
405.03	0.0677	0.2509	373.91	0.9513	0.9871
402.09	0.0967	0.3336	-----		
401.06	0.1053	0.3525	Enthalpy of mixing		
398.92	0.1293	0.4149	-----		
395.84	0.1580	0.4940	Chao, Jian-Ping - Zhang, Fu-Qiang - Dai, Ming, Studies of thermodynamic properties of binary mixtures containing an alcohol XVIII. Excess molar enthalpies of each of (one of the four butanols + trichloromethane or 1,2-dichloroethane), The Journal of Chemical Thermodynamics. 24 (1992) 823-827. doi:10.1016/S0021-9614(05)80227-7		
392.70	0.1993	0.5650	T / K = 298.15		
384.13	0.3160	0.7129	P / bar = UNKNOWN (1.0132)		
379.79	0.3866	0.7805			
375.54	0.4522	0.8342			

SA-HD systems (BAC = 7)

$h^M / \text{J.mol}^{-1}$	x_1		
-111.80	0.0265	Nagata, I. - Kawamura, Y. - Asano, H. - Fujiwara, K. -	
-185.00	0.0453	Ogasawara, Y., Excess Enthalpies for Binary Mixtures of	
-289.20	0.0827	Chloroform with Alcohols, Z. Phys. Chem. Leipzig. 259	
-348.40	0.1098	(1978) 1109-1116.	
-388.80	0.1516	T / K =	308.15
-391.60	0.1931	P / bar =	UNKNOWN (1.0132)
-372.70	0.2293	$h^M / \text{J.mol}^{-1}$	x_1
-312.40	0.2829	-107.40	0.0352
-223.10	0.3360	-220.10	0.0960
-118.10	0.3883	-248.80	0.1699
-10.50	0.4401	-202.60	0.2304
90.20	0.4912	-106.80	0.2947
189.20	0.5417	45.50	0.3711
275.20	0.5915	186.30	0.4344
350.80	0.6408	315.00	0.4920
420.20	0.6895	398.20	0.5308
475.80	0.7377	461.90	0.5625
508.20	0.7852	542.60	0.6055
518.60	0.8169	615.60	0.6497
508.20	0.8478	684.80	0.7042
482.60	0.8787	732.40	0.7965
427.50	0.9099	639.40	0.8852
337.90	0.9398	420.60	0.9455
200.20	0.9700	209.30	0.9772

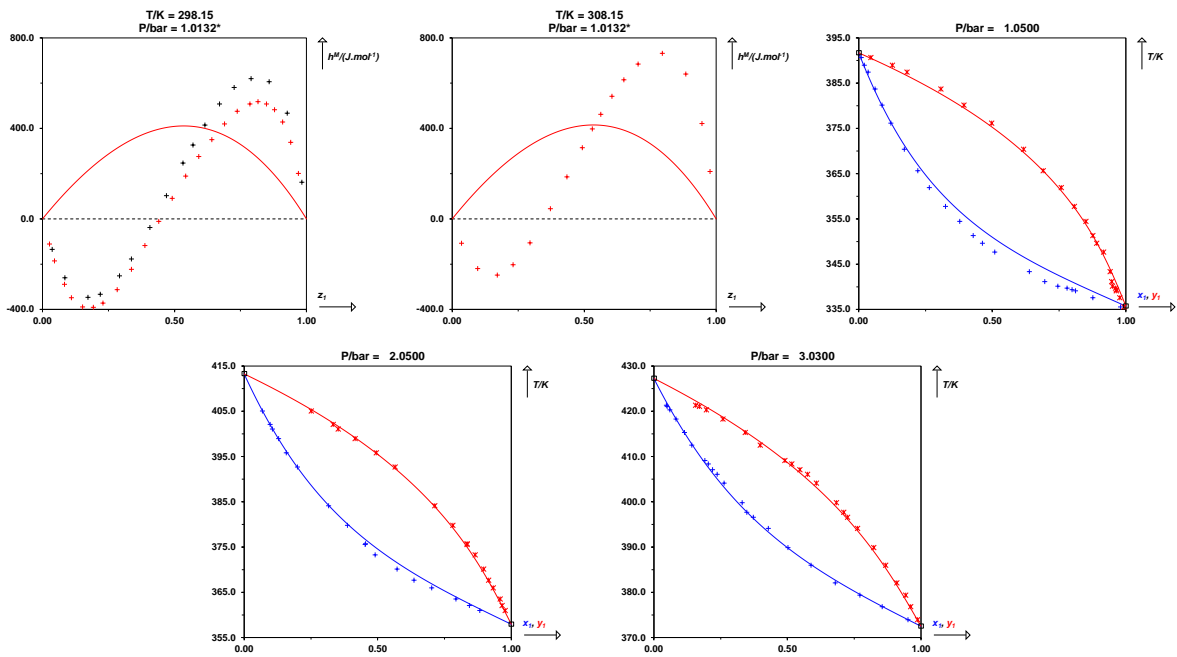
Nagata, I. - Kawamura, Y. - Asano, H. - Fujiwara, K. - Ogasawara, Y., Excess Enthalpies for Binary Mixtures of Chloroform with Alcohols, Z. Phys. Chem. Leipzig. 259 (1978) 1109-1116.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
-135.60	0.0371
-260.60	0.0851
-347.00	0.1718
-333.30	0.2191
-251.70	0.2918
-176.80	0.3369
-38.10	0.4062
101.80	0.4700
247.40	0.5320
327.20	0.5701
414.50	0.6150
507.90	0.6707
580.20	0.7264
620.40	0.7899
606.50	0.8579
467.60	0.9275
161.60	0.9822

SA-HD systems (BAC = 7)



TRICHLOROETHYLENE (1) + 1-BUTANOL (2)

CAS	79-01-6	71-36-3
InChiKey	XSTXAVWGXDKEL-UHFFFAOYSA-N	LRHPLDYGYMQRHN-UHFFFAOYSA-N
T_c / K	571.00	563.10
P_c / bar	49.10	44.14
ω	0.217	0.588

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 54.57$$

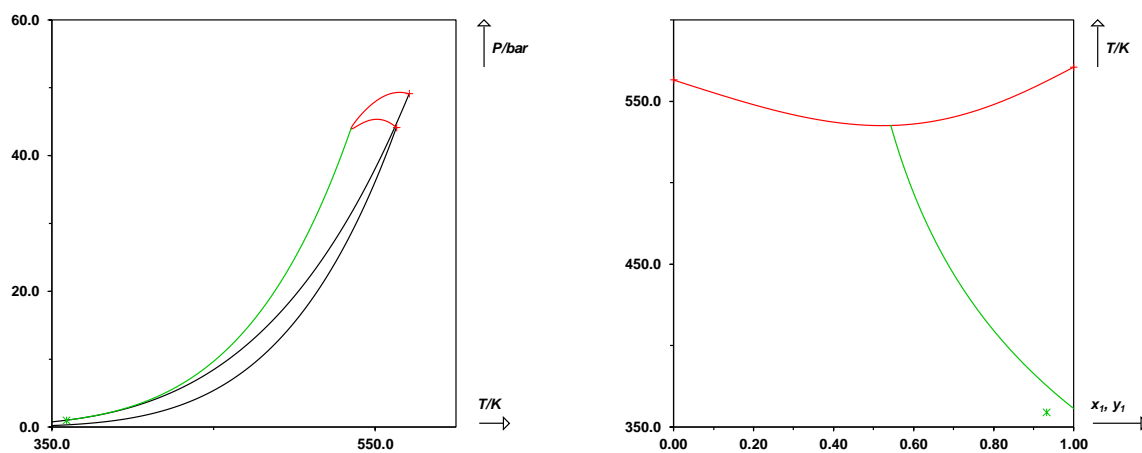
$$B/\text{MPa} = -42.36$$

Deviations

$$\text{MAPE on } x = 14 \%$$

$$\text{MAPE on } y = 12 \%$$

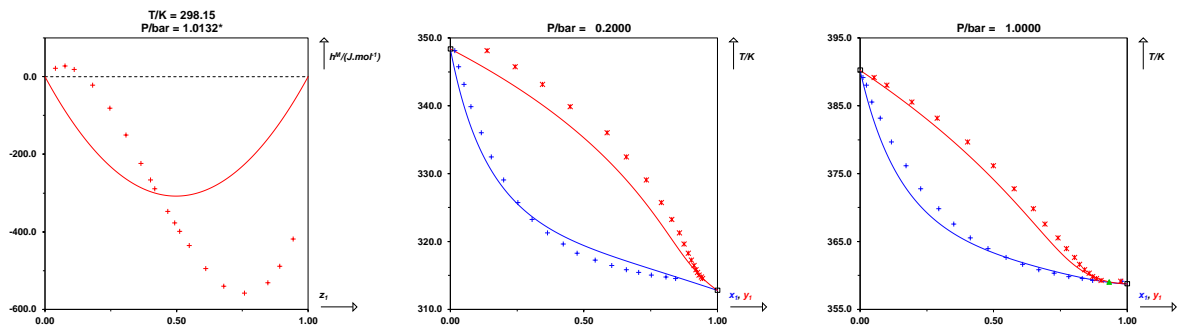
$$\text{MAPE on } h^M = 55 \%$$



-----			360.35	0.7270	0.8580	
Isobaric phase equilibrium data			359.85	0.7810	0.8710	
-----			359.55	0.8310	0.8850	
Dejoz, Ana - González-Alfaro, Vicenta - Miguel, Pablo J. -			359.25	0.8710	0.9020	
Vázquez, M. Isabel, Isobaric Vapor–Liquid Equilibria of			359.05	0.9320	0.9320	AZEO
Trichloroethylene with 1-Butanol and 2-Butanol at 20 and			359.15	0.9800	0.9760	
100 kPa, Journal of Chemical & Engineering Data. 41						
(1996) 89-92. doi:10.1021/je950163g						
P / bar = 0.2000						
T / K	x ₁	y ₁				
348.15	0.0160	0.1370				
345.75	0.0310	0.2430				
343.15	0.0510	0.3450				
339.85	0.0770	0.4490				
336.05	0.1160	0.5860				
332.45	0.1530	0.6590				
329.05	0.1990	0.7330				
325.75	0.2530	0.7900				
323.25	0.3060	0.8290				
321.25	0.3640	0.8580				
319.65	0.4230	0.8740				
318.25	0.4740	0.8900				
317.25	0.5420	0.9020				
316.45	0.6040	0.9120				
315.85	0.6580	0.9190				
315.45	0.7040	0.9250				
315.05	0.7520	0.9310				
314.75	0.8070	0.9390				
314.55	0.8430	0.9440				
Dejoz, Ana - González-Alfaro, Vicenta - Miguel, Pablo J. -						
Vázquez, M. Isabel, Isobaric Vapor–Liquid Equilibria of						
Trichloroethylene with 1-Butanol and 2-Butanol at 20 and						
100 kPa, Journal of Chemical & Engineering Data. 41						
(1996) 89-92. doi:10.1021/je950163g						
P / bar = 1.0000						
T / K	x ₁	y ₁				
389.15	0.0110	0.0520				
388.05	0.0230	0.1000				
385.55	0.0440	0.1940				
383.15	0.0760	0.2880				
379.65	0.1170	0.4030				
376.15	0.1720	0.4990				
372.75	0.2270	0.5760				
369.85	0.2950	0.6480				
367.55	0.3510	0.6920				
365.55	0.4120	0.7400				
363.95	0.4780	0.7720				
362.65	0.5460	0.8020				
361.65	0.6080	0.8210				
360.85	0.6680	0.8400				

Enthalpy of mixing						

Iloukhani, H., Excess Molar Enthalpies for Binary Mixtures						
with Trichloroethylene + Alkan-1-ols (C3–C8) at 298.15 K,						
Journal of Chemical & Engineering Data. 42 (1997) 802-						
804. doi:10.1021/je970024u						
T / K = 298.15						
P / bar = UNKNOWN (1.0132)						
	h ^M / J.mol ⁻¹	x ₁				
	21.50	0.0400				
	27.30	0.0764				
	18.50	0.1111				
	-22.30	0.1809				
	-81.70	0.2461				
	-150.30	0.3071				
	-223.90	0.3639				
	-266.10	0.4004				
	-288.80	0.4168				
	-347.10	0.4658				
	-376.90	0.4933				
	-399.30	0.5113				
	-435.70	0.5484				
	-495.10	0.6102				
	-540.20	0.6797				
	-557.80	0.7583				
	-531.10	0.8474				
	-488.90	0.8928				
	-418.50	0.9434				



2-BUTANOL (1) + TRICHLOROETHYLENE (2)

CAS	78-92-2	79-01-6
InChiKey	BTANRVKQNVYAZ-UHFFFAOYSA-N	XSTXAVWGXDKEL-UHFFFAOYSA-N
T_c / K	535.90	571.00
P_c / bar	41.89	49.10
ω	0.581	0.217

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 48.14$$

$$B/\text{MPa} = -43.12$$

Deviations

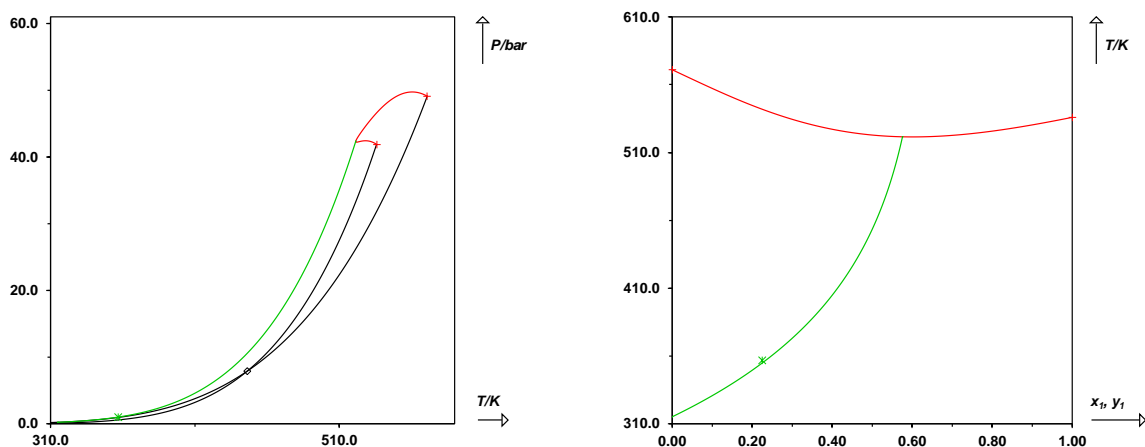
$$\text{MAPE on } x = 12 \%$$

$$\text{MAPE on } y = 13 \%$$

$$\text{MAPE on } x_{\text{az}} = 2.4 \%$$

$$\text{MAPE on } P_{\text{az}} = 0.28 \%$$

$$\text{MAPE on } h^{\text{M}} = 34 \%$$

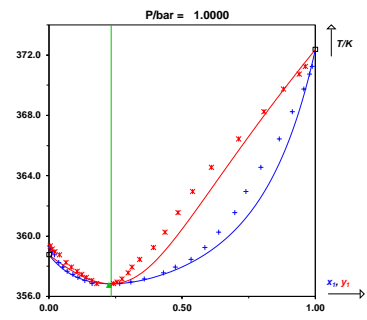
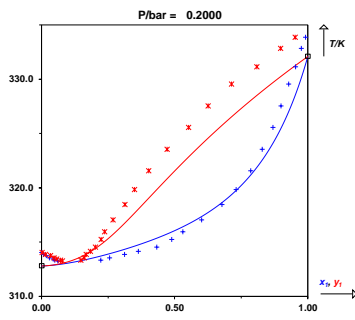
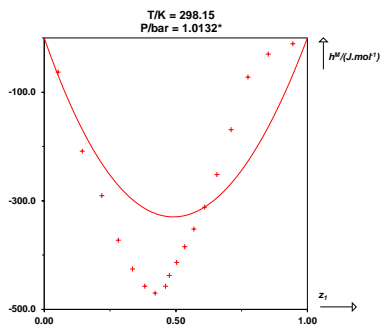


-----			360.25	0.6370	0.4360	
Isobaric phase equilibrium data			359.25	0.5850	0.3920	
-----			358.45	0.5330	0.3410	
Dejoz, Ana - González-Alfaro, Vicenta - Miguel, Pablo J. -			357.95	0.4750	0.3120	
Vázquez, M. Isabel, Isobaric Vapor-Liquid Equilibria of			357.55	0.4300	0.2970	
Trichloroethylene with 1-Butanol and 2-Butanol at 20 and			357.15	0.3580	0.2740	
100 kPa, Journal of Chemical & Engineering Data. 41			356.95	0.3070	0.2550	
(1996) 89-92. doi:10.1021/je950163g			356.85	0.2660	0.2430	
P / bar = 0.2000			356.75	0.2250	0.2250	AZEO
T / K	x ₁	y ₁	356.85	0.1620	0.1790	
333.85	0.9910	0.9530	357.05	0.1350	0.1610	
332.85	0.9750	0.8980	357.25	0.1080	0.1400	
331.15	0.9540	0.8080	357.45	0.0900	0.1230	
329.55	0.9280	0.7140	357.65	0.0680	0.1050	
327.55	0.8990	0.6250	357.95	0.0520	0.0840	
325.55	0.8690	0.5520	358.25	0.0370	0.0640	
323.55	0.8290	0.4720	358.75	0.0200	0.0390	
321.55	0.7850	0.4030	358.95	0.0120	0.0220	
319.85	0.7300	0.3490	359.15	0.0060	0.0120	
318.45	0.6780	0.3130	359.35	0.0020	0.0050	
317.05	0.6010	0.2680				
315.95	0.5300	0.2370				
315.25	0.4890	0.2230				
314.55	0.4330	0.2020				
314.15	0.3630	0.1830				
313.85	0.3110	0.1670				
313.55	0.2560	0.1600				
313.35	0.2220	0.1470				
313.25	0.0610	0.0780				
313.35	0.0490	0.0710				
313.45	0.0430	0.0570				
313.55	0.0300	0.0460				
313.75	0.0180	0.0330				
313.85	0.0080	0.0150				
314.05	0.0010	0.0020				

			Enthalpy of mixing			

Dejoz, Ana - González-Alfaro, Vicenta - Miguel, Pablo J. -			Iloukhani, H. - Parsa, J.B., Excess Molar Enthalpies of			
Vázquez, M. Isabel, Isobaric Vapor-Liquid Equilibria of			Binary Mixtures of Trichloroethylene with Six 2-Alkanols			
Trichloroethylene with 1-Butanol and 2-Butanol at 20 and			at 25°C, J. Solution Chem. 30 (2001) 425-433.			
100 kPa, Journal of Chemical & Engineering Data. 41			doi:10.1023/A:1010396430848			
(1996) 89-92. doi:10.1021/je950163g			T / K = 298.15			
P / bar = 1.0000			P / bar = UNKNOWN			
T / K	x ₁	y ₁	(1.0132)			
371.25	0.9880	0.9620	h ^M / J.mol ⁻¹	x ₁		
370.75	0.9790	0.9400	-11.10	0.9450		
369.75	0.9570	0.8800	-29.50	0.8513		
368.25	0.9140	0.8070	-72.50	0.7745		
366.45	0.8640	0.7120	-169.30	0.7104		
364.55	0.7950	0.6090	-251.70	0.6561		
362.95	0.7390	0.5390	-311.50	0.6095		
361.55	0.6970	0.4850	-352.10	0.5691		
			-384.30	0.5337		
			-413.60	0.5025		
			-437.80	0.4747		
			-457.40	0.4609		
			-469.80	0.4216		
			-457.20	0.3815		
			-425.40	0.3354		
			-372.90	0.2819		
			-290.30	0.2190		
			-208.70	0.1440		
			-63.00	0.0531		

SA-HD systems (BAC = 7)



TRICHLOROETHYLENE (1) + 2-METHOXYETHANOL (2)

CAS	79-01-6	109-86-4
InChiKey	XSTXAVWGXDKEL-UHFFFAOYSA-N	XNWFRZJHXBZDAG-UHFFFAOYSA-N
T_c / K	571.00	597.60
P_c / bar	49.10	52.85
ω	0.217	0.454

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 58.17$$

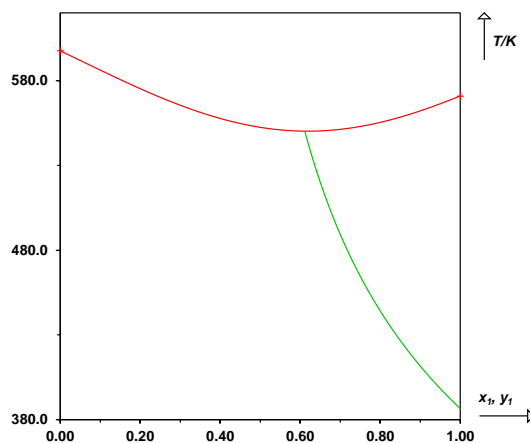
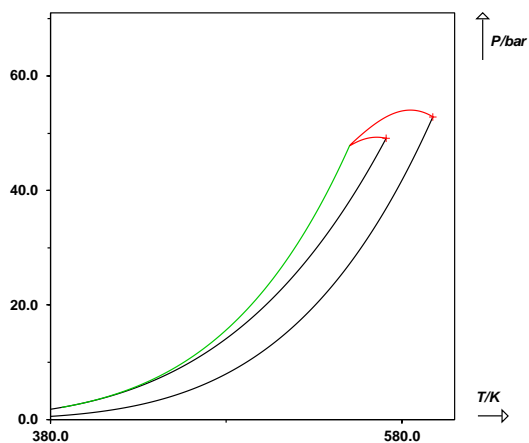
$$B/\text{MPa} = -41.35$$

Deviations

$$\text{MAPE on } x = 8.5\%$$

$$\text{MAPE on } y = 3.4\%$$

$$\text{MAPE on } h^M = 54\%$$



-----			-111.70	0.0535
Isothermal phase equilibrium data			-266.80	0.1487
-----			-306.20	0.1827
Jonasson, Ari - Savoia, Marco - Persson, Ole - Fredenslund, Aage, Isothermal vapor-liquid equilibrium data for ether + glycol, chloroalkene + glycol, epoxy ether + alkane, epoxy ether + alkene, and epoxy ether + chloroalkane systems, Journal of Chemical & Engineering Data. 39 (1994) 134-139. doi:10.1021/je00013a038			-381.80	0.2865
T / K = 341.01			-397.90	0.3077
P / bar	x ₁	y ₁	-380.10	0.4202
0.1436	0.0220	0.1796	-390.00	0.4365
0.1735	0.0474	0.3311	-332.30	0.5223
0.2594	0.1370	0.5867	-267.50	0.5854
0.3217	0.2201	0.6942	-198.30	0.6388
0.3778	0.3139	0.7604	-96.10	0.7086
0.4317	0.4319	0.8139	-21.70	0.7442
0.4705	0.5446	0.8483	36.20	0.7847
0.5046	0.6782	0.8809	101.10	0.8335
0.5288	0.7991	0.9083	147.10	0.8760
0.5427	0.8928	0.9347	172.80	0.9350
			121.90	0.9695

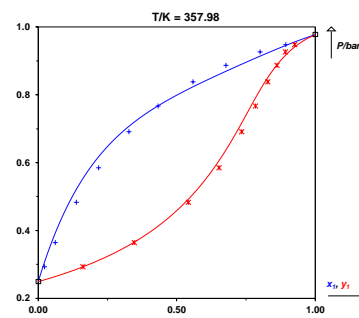
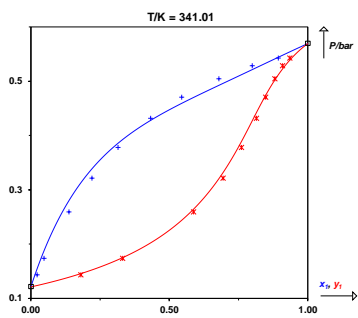
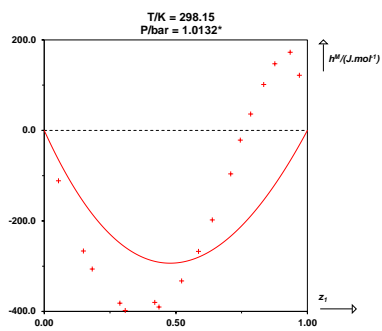
Jonasson, Ari - Savoia, Marco - Persson, Ole - Fredenslund, Aage, Isothermal vapor-liquid equilibrium data for ether + glycol, chloroalkene + glycol, epoxy ether + alkane, epoxy ether + alkene, and epoxy ether + chloroalkane systems, Journal of Chemical & Engineering Data. 39 (1994) 134-139. doi:10.1021/je00013a038

-----			T / K = 357.98
P / bar	x ₁	y ₁	
0.2931	0.0227	0.1608	
0.3642	0.0608	0.3470	
0.4835	0.1373	0.5416	
0.5853	0.2181	0.6523	
0.6907	0.3265	0.7345	
0.7672	0.4319	0.7841	
0.8381	0.5578	0.8281	
0.8868	0.6779	0.8609	
0.9260	0.8000	0.8922	
0.9482	0.8939	0.9245	

Enthalpy of mixing

Venkatesulu, D. - Rao, M.V.Prabhakara - Veeranna, D., Excess enthalpies of 2-alkoxyethanols with trichloroethylene and tetrachloroethylene at 298.15 K, Thermochemica Acta. 242 (1994) 33-39. doi:10.1016/0040-6031(94)85006-2

-----		T / K = 298.15
P / bar = UNKNOWN (1.0132)		
h ^M / J.mol ⁻¹	x ₁	



n-PROPYL FORMATE (1) + 1,1,2,2-TETRACHLOROETHANE (2)

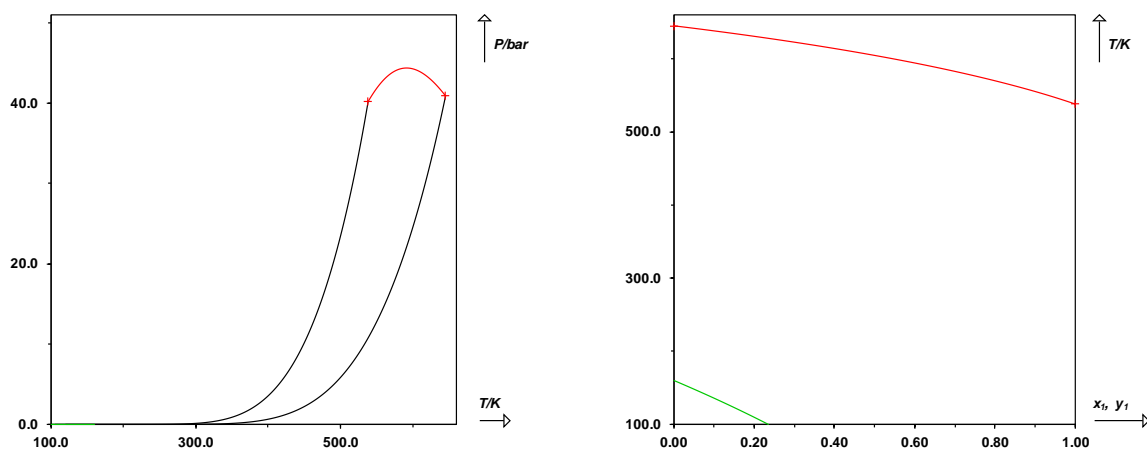
CAS	110-74-7	79-34-5
InChiKey	KFNNIILCVOLYIR-UHFFFAOYSA-N	QPFMBZIOSGYJDE-UHFFFAOYSA-N
T_c / K	538.00	645.00
P_c / bar	40.20	40.90
ω	0.309	0.247

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

A/MPa = -57.63

B/MPa = -120.7

*Deviations*MAPE on x = 6.3 %MAPE on y = 11 %MAPE on h^M = 9.8 %

Isothermal phase equilibrium data

Farkova, J. - Wichterle, I., Vapor-liquid equilibria of 1, 1, 2, 2-tetrachloroethane + some n-alkyl n-alkanoates, ELDATA Int. Electron. J. Phys.-Chem. Data. 1 (1995) 13-22.

T / K =	330.00	
P / bar	x₁	y₁
0.1178	0.2965	0.7416
0.1329	0.3406	0.7851
0.1464	0.3780	0.8178
0.1656	0.4213	0.8572
0.2093	0.5196	0.9155
0.2277	0.5606	0.9317
0.2505	0.6088	0.9470
0.2709	0.6514	0.9561
0.2912	0.6877	0.9645
0.3106	0.7270	0.9706
0.3290	0.7666	0.9728
0.3499	0.8090	0.9766
0.3935	0.8977	0.9917
0.4098	0.9324	0.9932
0.4278	0.9713	0.9970

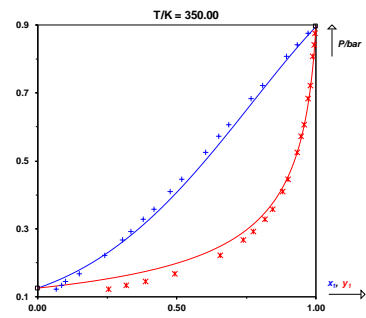
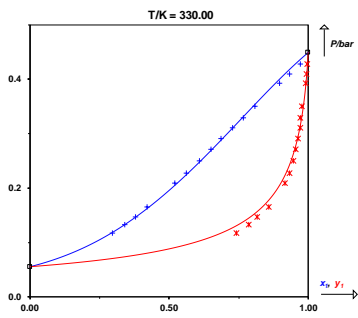
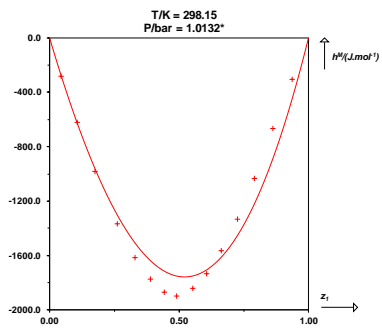
Farkova, J. - Wichterle, I., Vapor-liquid equilibria of 1, 1, 2, 2-tetrachloroethane + some n-alkyl n-alkanoates, ELDATA Int. Electron. J. Phys.-Chem. Data. 1 (1995) 13-22.

T / K =	350.00	
P / bar	x₁	y₁
0.1234	0.0651	0.2539
0.1339	0.0857	0.3172
0.1460	0.0997	0.3886
0.1679	0.1481	0.4911
0.2225	0.2411	0.6555
0.2668	0.3046	0.7392
0.2915	0.3334	0.7739
0.3286	0.3780	0.8170
0.3583	0.4178	0.8454
0.4085	0.4755	0.8799
0.4454	0.5161	0.9008
0.5257	0.6037	0.9332
0.5717	0.6505	0.9462
0.6059	0.6861	0.9569
0.6828	0.7674	0.9713
0.7212	0.8074	0.9789
0.8075	0.8954	0.9895
0.8407	0.9324	0.9932
0.8750	0.9706	0.9970

Enthalpy of mixing

Fenby, D.V. - Scott, R.L., Excess enthalpy. Hexafluorobenzene-benzene system, Int. Data Ser. Sel. Data Mixtures Ser. A. (1975) 130-138.

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h^M / J.mol⁻¹	x₁	
-279.60	0.0455	
-622.30	0.1058	
-984.30	0.1754	
-1365.2	0.2602	
-1614.7	0.3298	
-1773.9	0.3889	
-1868.8	0.4414	
-1897.4	0.4899	
-1844.1	0.5535	
-1737.2	0.6072	
-1566.9	0.6635	
-1330.9	0.7248	
-1034.3	0.7906	
-668.00	0.8615	
-303.90	0.9358	



CARBON DIOXIDE (1) + WATER (2)

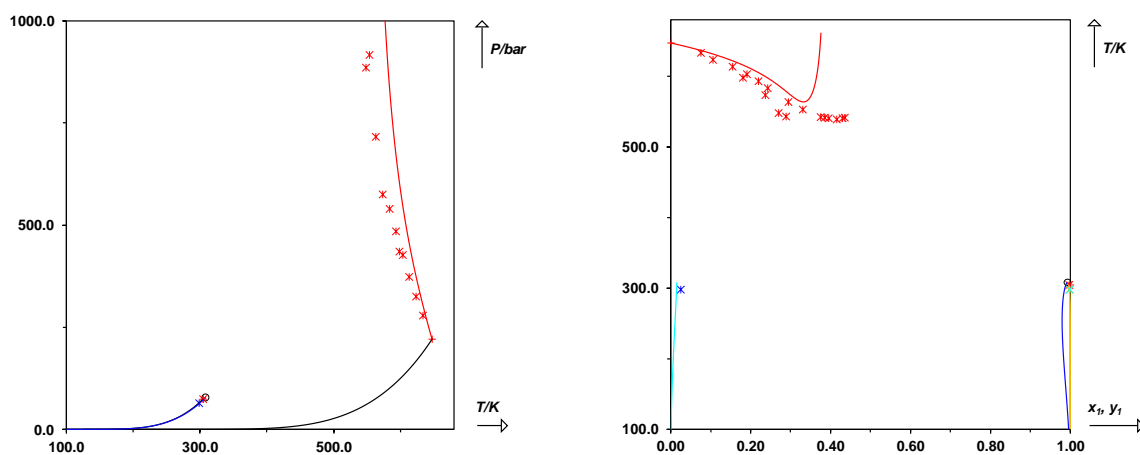
CAS	124-38-9	7732-18-5
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	XLYOFNOQVPJJP-UHFFFAOYSA-N
T_c / K	304.21	647.10
P_c / bar	73.83	220.64
ω	0.224	0.345

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

A/MPa = 589.9

B/MPa = 296.7

*Deviations*MAPE on x = 9.7 %MAPE on y = 13 %MAPE on x_c = 15 %MAPE on P_c = 38 %MAPE on z_{LLV} = 82 %MAPE on P_{LLV} = 2.4 %MAPE on h^M = 29 %

-----				Fluids.	52	(2010)	142-150.
Isothermal phase equilibrium data				doi:10.1016/j.supflu.2009.10.005			
-----				T / K =	308.15		
Zel'venskii, Ya.D., The solubility of carbon dioxide in water under pressure, Zh. Khim. Prom. 14 (1937) 1250-1257.				P / bar	x_1		
T / K =	298.15			75.80	0.0228766		
P / bar	x_1			103.40	0.0239265		
10.74	0.0064			131.00	0.0246281		
10.82	0.0062			54.50	0.0228766		
21.33	0.0118			57.20	0.0239265		
22.48	0.0124			58.50	0.0246281		
24.29	0.0129			Liu, Yuanhui - Hou, Minqiang - Yang, Guanying - Han, Buxing, Solubility of CO ₂ in aqueous solutions of NaCl, KCl, CaCl ₂ and their mixed salts at different temperatures and pressures, The Journal of Supercritical Fluids. 56 (2011) 125-129. doi:10.1016/j.supflu.2010.12.003			
25.50	0.0134			T / K =	308.15		
30.79	0.0156			P / bar	x_1		
33.70	0.0166			21.00	0.0093343		
33.79	0.0166			40.90	0.0157410		
38.08	0.0185			60.80	0.0203520		
38.42	0.0186			80.90	0.0223964		
43.25	0.0203			100.80	0.0231388		
44.18	0.0204			120.50	0.0237513		
54.98	0.0229			140.10	0.0245403		
55.06	0.0230			158.30	0.0249355		
61.68	0.0240			King, M.B. - Mubarak, A. - Kim, J.D. - Bott, T.R., The mutual solubilities of water with supercritical and liquid carbon dioxides, The Journal of Supercritical Fluids. 5 (1992) 296-302. doi:10.1016/0896-8446(92)90021-B			
Hou, Shu-Xin - Maitland, Geoffrey C. - Trusler, J.P. Martin, Measurement and modeling of the phase behavior of the (carbon dioxide+water) mixture at temperatures from 298.15K to 448.15K, The Journal of Supercritical Fluids. 73 (2013) 87-96. doi:10.1016/j.supflu.2012.11.011				T / K =	308.15		
P / bar	x_1^a	x_1^b	y_1	P / bar	y_1		
16.66	0.0089	-	0.9973	91.20	0.99616		
32.58	0.0154	-	0.9984	101.30	0.99593		
63.91	0.0248	0.9974	0.9981	111.50	0.99586		
Liu, Yuanhui - Hou, Minqiang - Ning, Hui - Yang, Dezhong - Yang, Guanying - Han, Buxing, Phase Equilibria of CO ₂ + N ₂ + H ₂ O and N ₂ + CO ₂ + H ₂ O + NaCl + KCl + CaCl ₂ Systems at Different Temperatures and Pressures, Journal of Chemical & Engineering Data. 57 (2012) 1928-1932. doi:10.1021/je3000958				126.70	0.99565		
T / K =	308.15			136.80	0.99560		
P / bar	x_1			152.00	0.99543		
80.00	0.0224			202.70	0.99502		
120.00	0.0238			Zaalishvili, S.D., Solubility of carbon dioxide from its mixtures with hydrogen and nitrogen in water under pressure, Zh. Fiz. Khim. 14 (1940) 413-417.			
160.00	0.0250			T / K =	308.15		
Ferrentino, Giovanna - Barletta, Diego - Balaban, Murat Omer - Ferrari, Giovanna - Poletto, Massimo, Measurement and prediction of CO ₂ solubility in sodium phosphate monobasic solutions for food treatment with high pressure carbon dioxide, The Journal of Supercritical				P / bar	x_1		
				3.242	0.00187		
				6.080	0.00352		
				10.23	0.00592		
				13.68	0.00791		
				3.546	0.00211		
				3.040	0.00178		

6.688 0.00391
9.018 0.00527

Hou, Shu-Xin - Maitland, Geoffrey C. - Trusler, J.P. Martin, Measurement and modeling of the phase behavior of the (carbon dioxide+water) mixture at temperatures from 298.15K to 448.15K, The Journal of Supercritical Fluids. 73 (2013) 87-96. doi:10.1016/j.supflu.2012.11.011

T / K = 323.15

P / bar	x ₁	y ₁
10.89	0.0033	0.9719
29.80	0.0090	0.9949
74.06	0.0183	0.9965
100.21	0.0205	0.9960
129.73	0.0214	0.9947
175.33	0.0226	0.9939

Dohrn, R. - Bünz, A.P. - Devlieghere, F. - Thelen, D., Experimental measurements of phase equilibria for ternary and quaternary systems of glucose, water, CO₂ and ethanol with a novel apparatus, Fluid Phase Equilibria. 83 (1993) 149-158. doi:10.1016/0378-3812(93)87017-U

T / K = 323.15

P / bar	x ₁	y ₁
101.00	0.0208	0.9945
201.00	0.0235	0.9932
301.00	0.0251	0.9922

D'souza, Rupert - Patrick, Jennie R. - Teja, Aryn S., High Pressure Phase Equilibria in the Carbon Dioxide - n-Hexadecane and Carbon Dioxide - Water Systems, The Canadian Journal of Chemical Engineering. 66 (1988) 319-323. doi:10.1002/cjce.5450660221

T / K = 323.15

P / bar	x ₁	y ₁
101.33	0.0198	0.9945
152.00	0.0210	0.9921

Briones, J.A. - Mullins, J.C. - Thies, M.C. - Kim, B.-U., Ternary phase equilibria for acetic acid-water mixtures with supercritical carbon dioxide, Fluid Phase Equilibria. 36 (1987) 235-246. doi:10.1016/0378-3812(87)85026-4

T / K = 323.15

P / bar	x ₁	y ₁
68.20	0.0165	0.9966
75.30	0.0175	0.9966
87.20	0.0177	0.9964
101.30	0.0208	0.9956
122.10	0.0210	0.9946
147.50	0.0221	0.9939
176.80	0.0226	0.9936

Bamberger, A. - Sieder, G. - Maurer, G., High-pressure (vapor+liquid) equilibrium in binary mixtures of (carbon dioxide+water or acetic acid) at temperatures from 313 to 353 K, The Journal of Supercritical Fluids. 17 (2000) 97-110. doi:10.1016/S0896-8446(99)00054-6

T / K = 333.20

P / bar	x ₁	y ₁
40.50	0.0096	0.9934
70.80	0.0157	0.9949
80.80	0.0166	0.9950
90.90	0.0179	0.9953
100.90	0.0186	0.9951
111.00	0.0195	0.9947
121.00	0.0201	0.9942
141.10	0.0208	0.9922

Hou, Shu-Xin - Maitland, Geoffrey C. - Trusler, J.P. Martin, Measurement and modeling of the phase behavior of the (carbon dioxide+water) mixture at temperatures from 298.15K to 448.15K, The Journal of Supercritical Fluids. 73 (2013) 87-96. doi:10.1016/j.supflu.2012.11.011

T / K = 348.15

P / bar	x ₁	y ₁
11.01	0.0022	0.9687
29.21	0.0061	0.9858
71.23	0.0127	0.9916
101.67	0.0159	0.9919
132.82	0.0186	0.9916
169.18	0.0199	0.9900

D'souza, Rupert - Patrick, Jennie R. - Teja, Aryn S., High Pressure Phase Equilibria in the Carbon Dioxide - n-Hexadecane and Carbon Dioxide - Water Systems, The Canadian Journal of Chemical Engineering. 66 (1988) 319-323. doi:10.1002/cjce.5450660221

T / K = 348.15

P / bar	x ₁	y ₁
101.33	0.0156	0.9926
152.00	0.0188	0.9910

Gillespie, P.C. - Wilson, G.M., Vapor-Liquid and Liquid-Liquid Equilibria: Water - Methane, Water - Carbon Dioxide, Water - Hydrogen Sulfide, Water - n-Pentane, Water - Methane - n-Pentane, GPA Research Report. (1982) 1-73.

T / K = 348.15

P / bar	x ₁	y ₁
6.895	0.0015	0.9399
25.34	0.0054	0.9818
50.68	0.0101	0.9891
101.35	0.0162	0.9927
202.71	0.0209	0.9906

Bamberger, A. - Sieder, G. - Maurer, G., High-pressure (vapor+liquid) equilibrium in binary mixtures of (carbon dioxide+water or acetic acid) at temperatures from 313 to 353 K, The Journal of Supercritical Fluids. 17 (2000) 97-110. doi:10.1016/S0896-8446(99)00054-6

T / K = 353.10

P / bar	x ₁	y ₁
40.50	0.0080	0.9857
60.60	0.0114	0.9891
70.80	0.0128	0.9896
80.80	0.0140	0.9903
90.90	0.0151	0.9908
100.90	0.0160	0.9907
111.00	0.0172	0.9910
121.00	0.0176	0.9904
131.00	0.0184	0.9900

Gillespie, P.C. - Wilson, G.M., Vapor-Liquid and Liquid-Liquid Equilibria: Water - Methane, Water - Carbon Dioxide, Water - Hydrogen Sulfide, Water - n-Pentane, Water - Methane - n-Pentane, GPA Research Report. (1982) 1-73.

T / K = 366.48

P / bar	x ₁	y ₁
6.895	0.0010	0.8797
25.34	0.0043	0.9653
50.68	0.0085	0.9803
101.35	0.0145	0.9863
202.71	0.0206	0.9857

Hou, Shu-Xin - Maitland, Geoffrey C. - Trusler, J.P. Martin, Measurement and modeling of the phase behavior of the (carbon dioxide+water) mixture at temperatures from 298.15K to 448.15K, The Journal of Supercritical Fluids. 73 (2013) 87-96. doi:10.1016/j.supflu.2012.11.011

T / K = 373.15

P / bar	x ₁	y ₁
11.07	0.0017	0.9120
24.26	0.0039	0.9531
70.88	0.0109	0.9790
102.35	0.0137	0.9825
133.52	0.0163	0.9832
170.70	0.0187	0.9829

Pfohl, O. - Avramova, Pavlina - Brunner, Gerd, Two- and three-phase equilibria in systems containing benzene derivatives, carbon dioxide, and water at 373.15 K and 10-30 MPa, Fluid Phase Equilibria. 141 (1998) 179-206. doi:10.1016/S0378-3812(97)00210-0

T / K = 373.15

P / bar	x ₁	y ₁
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100.00	0.0110	0.9799
200.00	0.0179	0.9810
300.00	0.0204	0.9767

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K = 383.15

P / bar	x ₁	y ₁
100.00	0.0140	0.9560
200.00	0.0210	0.9580
300.00	0.0240	0.9480
399.99	0.0260	0.9320
500.00	0.0280	0.9140
600.00	0.0300	0.8930
700.00	0.0315	0.8720
800.00	0.0330	0.8540
900.01	0.0345	0.8400
1000.0	0.0360	0.8300
1100.0	0.0370	0.8220
1200.0	0.0375	0.8160
1300.0	0.0385	0.8100
1400.0	0.0390	0.8040
1500.0	0.0400	0.8000

Gillespie, P.C. - Wilson, G.M., Vapor-Liquid and Liquid-Liquid Equilibria: Water - Methane, Water - Carbon Dioxide, Water - Hydrogen Sulfide, Water - n-Pentane, Water - Methane - n-Pentane, GPA Research Report. (1982) 1-73.

T / K = 394.26

P / bar	x ₁	y ₁
6.895	0.0009	0.6889
25.34	0.0036	0.9078
50.68	0.0073	0.9483
101.35	0.0132	0.9677
202.71	0.0205	0.9728

Hou, Shu-Xin - Maitland, Geoffrey C. - Trusler, J.P. Martin, Measurement and modeling of the phase behavior of the (carbon dioxide+water) mixture at temperatures from 298.15K to 448.15K, The Journal of Supercritical Fluids. 73 (2013) 87-96. doi:10.1016/j.supflu.2012.11.011

T / K = 398.15

P / bar	x ₁	y ₁
11.58	0.0014	0.7869
31.76	0.0044	0.9147
73.21	0.0100	0.9554
99.84	0.0131	0.9644
134.56	0.0157	0.9664
174.35	0.0186	0.9691

Hou, Shu-Xin - Maitland, Geoffrey C. - Trusler, J.P. Martin, Measurement and modeling of the phase behavior of the (carbon dioxide+water) mixture at temperatures from 298.15K to 448.15K, The Journal of Supercritical Fluids. 73 (2013) 87-96. doi:10.1016/j.supflu.2012.11.011

T / K =	423.15	
P / bar	x ₁	y ₁
14.28	0.0013	0.6536
29.87	0.0035	0.8107
71.97	0.0087	0.9055
100.14	0.0123	0.9250
134.18	0.0156	0.9363
173.55	0.0191	0.9434

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K =	423.15	
P / bar	x ₁	y ₁
100.00	0.0135	0.8800
200.00	0.0215	0.9100
300.00	0.0260	0.9000
399.99	0.0290	0.8820
500.00	0.0320	0.8620
600.00	0.0345	0.8400
700.00	0.0370	0.8240
800.00	0.0390	0.8080
900.01	0.0405	0.7940
1000.0	0.0420	0.7800
1100.0	0.0440	0.7700
1200.0	0.0450	0.7640
1300.0	0.0460	0.7580
1400.0	0.0470	0.7540
1500.0	0.0480	0.7520

Hou, Shu-Xin - Maitland, Geoffrey C. - Trusler, J.P. Martin, Measurement and modeling of the phase behavior of the (carbon dioxide+water) mixture at temperatures from 298.15K to 448.15K, The Journal of Supercritical Fluids. 73 (2013) 87-96. doi:10.1016/j.supflu.2012.11.011

T / K =	448.15	
P / bar	x ₁	y ₁
13.27	0.00063	0.29570
36.57	0.00370	0.71000
75.65	0.00861	0.84270
104.97	0.01135	0.88080
134.42	0.01413	0.89333
174.59	0.01764	0.89825

Zawisza, Andrzej - Malesinska, Boguslawa, Solubility of carbon dioxide in liquid water and of water in gaseous carbon dioxide in the range 0.2-5 MPa and at temperatures up to 473 K, Journal of Chemical & Engineering Data. 26 (1981) 388-391. doi:10.1021/je00026a012

T / K =	448.15	
P / bar	x ₁	
11.97	0.0005	
19.77	0.0016	
25.96	0.0025	
30.37	0.0030	
40.80	0.0046	

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K =	473.15	
P / bar	x ₁	y ₁
100.00	0.0130	0.7150
200.00	0.0260	0.8200
300.00	0.0340	0.8250
399.99	0.0410	0.8160
500.00	0.0470	0.8000
600.00	0.0520	0.7800
700.00	0.0560	0.7600
800.00	0.0580	0.7450
900.01	0.0610	0.7320
1000.0	0.0630	0.7200
1100.0	0.0650	0.7160
1200.0	0.0670	0.7060
1300.0	0.0690	0.7000
1400.0	0.0700	0.6940
1500.0	0.0720	0.6900

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K =	523.15	
P / bar	x ₁	y ₁
100.00	0.0120	0.4100
200.00	0.0270	0.6360
300.00	0.0420	0.6800
399.99	0.0550	0.6760
500.00	0.0640	0.6600
600.00	0.0740	0.6360
700.00	0.0840	0.6130
800.00	0.0940	0.5930
900.01	0.1040	0.5800
1000.0	0.1150	0.5670

SA-HA systems (BAC = 8)

1100.0	0.1250	0.5550	1500.0	0.2400	0.5260	
1200.0	0.1320	0.5480	1890.0	0.3950	0.3950	CRIT
1300.0	0.1360	0.5420	3140.0	0.4300	0.4300	CRIT
			3500.0	0.3550	0.5100	

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K = 533.15

P / bar	x ₁	y ₁
200.00	0.0270	0.5720
250.01	0.0350	0.6200
300.00	0.0440	0.6400
399.99	0.0590	0.6420
500.00	0.0730	0.6240
600.00	0.0870	0.6040
700.00	0.1000	0.5800
800.00	0.1130	0.5600
900.01	0.1250	0.5480
1000.0	0.1350	0.5360
1100.0	0.1450	0.5240
1200.0	0.1550	0.5100
1300.0	0.1600	0.5040
1400.0	0.1650	0.5020
1500.0	0.1750	0.5000

Tödheide, K. - Franck, E. U., Das Zweiphasengebiet und die kritische Kurve im System Kohlendioxid-Wasser bis zu Drucken von 3500 bar, Zeitschrift für Physikalische Chemie. 37 (1963) 387-401. doi:10.1524/zpch.1963.37.5_6.387

T / K = 538.15

P / bar	x ₁	y ₁
200.00	0.0260	0.5770
500.00	0.0800	0.6570
1000.0	0.1550	0.6000
1500.0	0.2150	0.5460
2000.0	0.2720	0.5080
2500.0	0.2980	0.4930
3000.0	0.2920	0.5500
3500.0	0.2800	0.5700

Tödheide, K. - Franck, E. U., Das Zweiphasengebiet und die kritische Kurve im System Kohlendioxid-Wasser bis zu Drucken von 3500 bar, Zeitschrift für Physikalische Chemie. 37 (1963) 387-401. doi:10.1524/zpch.1963.37.5_6.387

T / K = 540.15

P / bar	x ₁	y ₁
200.00	0.0260	0.5670
500.00	0.0820	0.6500
1000.0	0.1700	0.5750

Tödheide, K. - Franck, E. U., Das Zweiphasengebiet und die kritische Kurve im System Kohlendioxid-Wasser bis zu Drucken von 3500 bar, Zeitschrift für Physikalische Chemie. 37 (1963) 387-401. doi:10.1524/zpch.1963.37.5_6.387

T / K = 541.15

P / bar	x ₁	y ₁	
200.00	0.0260	0.5590	
300.00	0.0480	0.6200	
400.00	0.0640	0.6440	
500.00	0.0830	0.6420	
600.00	0.0950	0.6380	
700.00	0.1180	0.6220	
799.99	0.1380	0.6030	
899.99	0.1600	0.5860	
1000.0	0.1790	0.5690	
1100.0	0.1970	0.5560	
1200.0	0.2110	0.5470	
1300.0	0.2280	0.5300	
1400.0	0.2480	0.5180	
1500.0	0.2780	0.4970	
1620.0	0.3850	0.3850	CRIT
3600.0	0.4350	0.4350	CRIT

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K = 543.15

P / bar	x ₁	y ₁	
200.00	0.0270	0.5300	
250.01	0.0360	0.5700	
500.00	0.0870	0.5700	
600.00	0.1060	0.5460	
700.00	0.1250	0.5200	
800.00	0.1450	0.4960	
900.01	0.1660	0.4620	
1000.0	0.1900	0.4240	
1100.0	0.2150	0.3820	
1200.0	0.2500	0.3400	
1230.0	0.2880	0.2880	CRIT

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

SA-HA systems (BAC = 8)

T / K =	548.15		250.01	0.0400	0.1620	
P / bar	x ₁	y ₁	300.00	0.0640	0.1660	
100.00	0.0100	0.2560	325.00	0.1050	0.1050	CRIT
150.00	0.0190	0.4260				
200.00	0.0280	0.5000				
250.01	0.0380	0.5400				
500.00	0.0960	0.5300				
600.00	0.1200	0.4960				
700.00	0.1440	0.4600				
800.00	0.1750	0.4200				
885.00	0.2700	0.2700				CRIT

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K =	573.15		
P / bar	x ₁	y ₁	
100.00	0.0040	0.0800	
150.00	0.0160	0.2900	
200.00	0.0290	0.3900	
250.01	0.0410	0.4340	
300.00	0.0540	0.4540	
350.00	0.0680	0.4560	
399.99	0.0840	0.4480	
450.00	0.1040	0.4220	
500.00	0.1270	0.3800	
549.99	0.1700	0.3200	
575.00	0.2360	0.2360	CRIT

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K =	598.15		
P / bar	x ₁	y ₁	
150.00	0.0100	0.1060	
200.00	0.0260	0.2460	
250.01	0.0430	0.3210	
300.00	0.0610	0.3420	
350.00	0.0820	0.3340	
399.99	0.1120	0.2860	
435.00	0.1800	0.1800	CRIT

Takenouchi, S. - Kennedy, G. C., The binary system H₂O-CO₂ at high temperatures and pressures, American Journal of Science. 262 (1964) 1055-1074. doi:10.2475/ajs.262.9.1055

T / K =	623.15		
P / bar	x ₁	y ₁	
200.00	0.0150	0.0900	

Isobaric phase equilibrium data

Gillespie, P.C. - Wilson, G.M., Vapor-Liquid and Liquid-Liquid Equilibria: Water - Methane, Water - Carbon Dioxide, Water - Hydrogen Sulfide, Water - n-Pentane, Water - Methane - n-Pentane, GPA Research Report. (1982) 1-73.

P / bar =	101.35	
T / K	x ₁	y ₁
288.71	0.0242	0.9972
298.15	0.0249	0.9966
302.59	0.0239	0.9961
304.21	0.0241	0.9959

Gillespie, P.C. - Wilson, G.M., Vapor-Liquid and Liquid-Liquid Equilibria: Water - Methane, Water - Carbon Dioxide, Water - Hydrogen Sulfide, Water - n-Pentane, Water - Methane - n-Pentane, GPA Research Report. (1982) 1-73.

P / bar =	202.71	
T / K	x ₁	y ₁
288.71	0.0261	0.9971
298.15	0.0257	0.9962
302.59	0.0263	0.9956
304.21	0.0262	0.9955

Enthalpy of mixing

Pérez, Eduardo - Sánchez-Vicente, Yolanda - Cabañas, Albertina - Pando, Concepción - Renuncio, Juan A.R., Excess molar enthalpies for mixtures of supercritical carbon dioxide and water+ethanol solutions, The Journal of Supercritical Fluids. 36 (2005) 23-30. doi:10.1016/j.supflu.2005.03.006

T / K =	308.15	
P / bar =	76.40	
h ^M / J.mol ⁻¹	z ₁	
-94.00	0.0060	
-207.00	0.0110	
-231.00	0.0300	
-220.00	0.0500	
-215.00	0.0720	
-212.00	0.1050	
-201.00	0.1170	
-187.00	0.1550	
-184.00	0.1710	

SA-HA systems (BAC = 8)

-179.00	0.2020	1667.0	0.0340
-172.00	0.2160	2108.0	0.0489
-168.00	0.2380	2638.0	0.0642
-159.00	0.2590	3527.0	0.0789
-137.00	0.3560	4016.0	0.0935
-98.00	0.5130	5103.0	0.1143
-67.00	0.6280	5397.0	0.1252
-33.00	0.7290	6487.0	0.1403
-20.00	0.8120	6654.0	0.1473
15.00	0.9370	8237.0	0.1845
		11436.0	0.2551
		11811.0	0.2710
Xuemin Chen - Gillespie, Sue E. - Oscarson, John L. - Izatt, Reed M., Calorimetric determination of thermodynamic quantities for chemical reactions in the system CO ₂ -NaOH-H ₂ O from 225 to 325°C, Journal of Solution Chemistry. 21 (1992) 825-848. doi:10.1007/BF00651511		14357.0	0.3116
		15441.0	0.3407
		15217.0	0.4045
T / K = 498.15		14370.0	0.4250
P / bar = 124.00		13600.0	0.4741
$h^M / J.mol^{-1}$ z_1		12158.0	0.5048
546.00	0.0508	11990.0	0.5289
715.00	0.0666	11168.0	0.5906
960.00	0.0869	8414.0	0.6711
1737.0	0.1599	6954.0	0.7403
2481.0	0.2222	5123.0	0.8032
2881.0	0.2631	4475.0	0.8323
3842.0	0.3487	3203.0	0.8715
4560.0	0.4166	1594.0	0.9395
5265.0	0.4716		
5747.0	0.5171		
6582.0	0.5881	Xuemin Chen - Gillespie, Sue E. - Oscarson, John L. - Izatt, Reed M., Calorimetric determination of thermodynamic quantities for chemical reactions in the system CO ₂ -NaOH-H ₂ O from 225 to 325°C, Journal of Solution Chemistry. 21 (1992) 825-848. doi:10.1007/BF00651511	
7595.0	0.6817		
7782.0	0.7281		
7302.0	0.7407	T / K = 573.15	
6117.0	0.7812	P / bar = 110.00	
5338.0	0.8107	$h^M / J.mol^{-1}$ z_1	
4371.0	0.8510	543.00	0.0085
3555.0	0.8771	803.00	0.0113
2652.0	0.9049	1482.0	0.0169
1858.0	0.9346	2018.0	0.0224
1396.0	0.9501	2776.0	0.0279
		3339.0	0.0332
		3827.0	0.0399
Xuemin Chen - Gillespie, Sue E. - Oscarson, John L. - Izatt, Reed M., Calorimetric determination of thermodynamic quantities for chemical reactions in the system CO ₂ -NaOH-H ₂ O from 225 to 325°C, Journal of Solution Chemistry. 21 (1992) 825-848. doi:10.1007/BF00651511		5154.0	0.0491
		6532.0	0.0644
		8137.0	0.0789
T / K = 548.15		10128.0	0.0936
P / bar = 104.00		12053.0	0.1146
$h^M / J.mol^{-1}$ z_1		13872.0	0.1250
306.00	0.0112	15744.0	0.1474
802.00	0.0223	18379.0	0.1848

17141.0	0.2553
15497.0	0.3119
13796.0	0.4047
11557.0	0.5049
9054.0	0.6047
7691.0	0.6710
6241.0	0.7328
4480.0	0.8031
3024.0	0.8718
1448.0	0.9391

Wormald, C.J. - Lancaster, N.M. - Sellars, A.J., The excess molar enthalpies of $\{x\text{H}_2\text{O} + (1-x)\text{CO}\}(\text{g})$ and $\{x\text{H}_2\text{O} + (1-x)\text{CO}_2\}(\text{g})$ at high temperatures and pressures, The Journal of Chemical Thermodynamics. 18 (1986) 135-147. doi:10.1016/0021-9614(86)90128-X

T / K = 648.20

P / bar = 50.00

$h^M / \text{J}\cdot\text{mol}^{-1}$ z_1

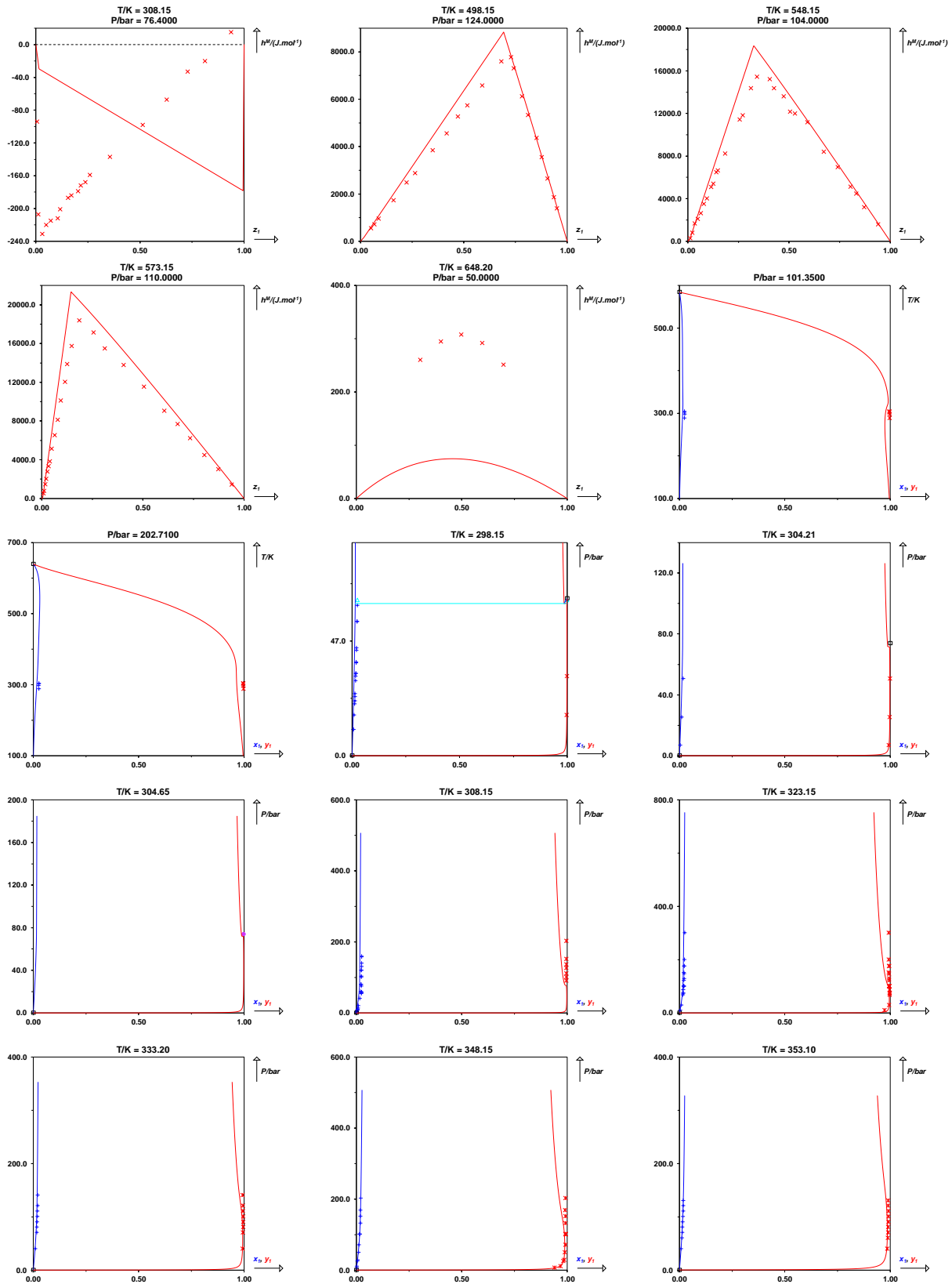
260.00	0.3030
295.00	0.4010
308.00	0.4970
292.00	0.5970
251.00	0.6980

Critical point

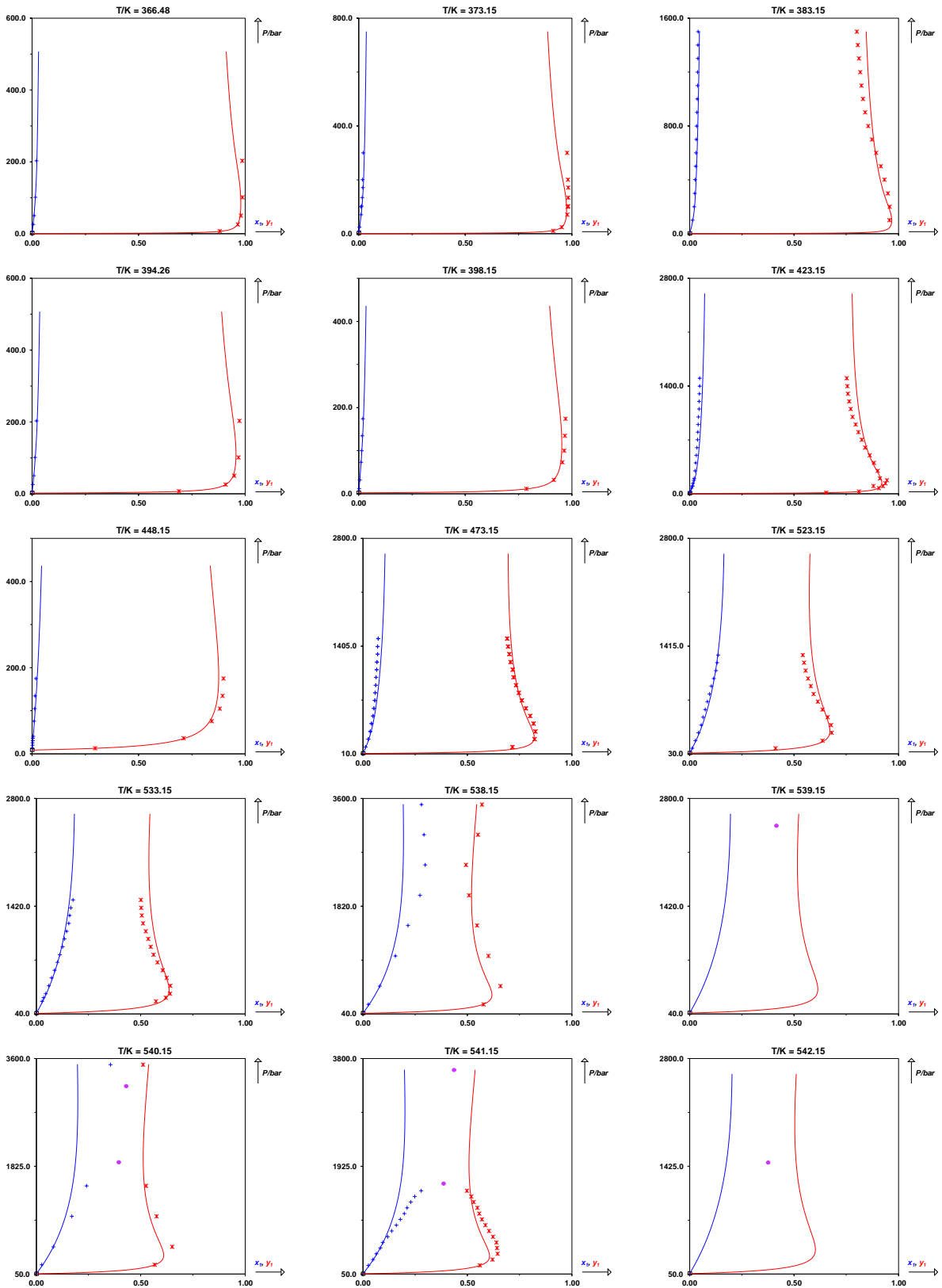
Tödheide, K. - Franck, E. U., Das Zweiphasengebiet und die kritische Kurve im System Kohlendioxid–Wasser bis zu Drucken von 3500 bar, Zeitschrift für Physikalische Chemie. 37 (1963) 387-401. doi:10.1524/zpch.1963.37.5_6.387

T / K	P / bar	x_1
539.15	2450.0	0.4150
542.15	1470.0	0.3750
553.15	917.00	0.3300
563.15	716.00	0.2950
583.15	539.00	0.2420
593.15	485.00	0.2200
603.15	427.00	0.1900
613.15	373.00	0.1550
633.15	279.00	0.0750

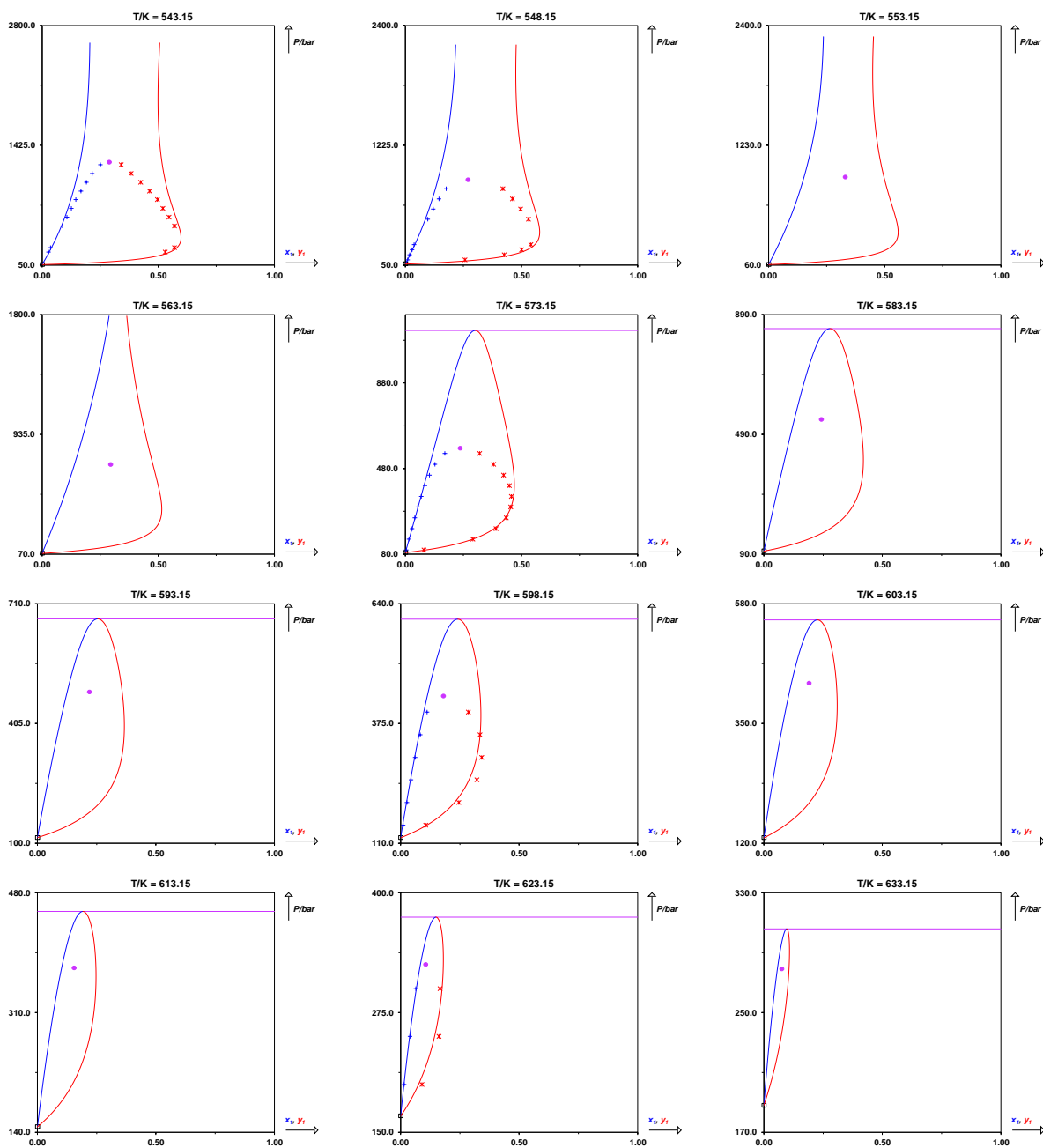
SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



DIMETHYL ETHER (1) + WATER (2)

CAS	115-10-6	7732-18-5
InChiKey	LCGLNKUTAGEVQW-UHFFFAOYSA-N	XLYOFNOQVPJJP-UHFFFAOYSA-N
T_c / K	400.10	647.10
P_c / bar	53.70	220.64
ω	0.200	0.345

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 306.2$$

$$B/\text{MPa} = -84.48$$

Deviations

$$\text{MAPE on } x = 24 \%$$

$$\text{MAPE on } y = 24 \%$$

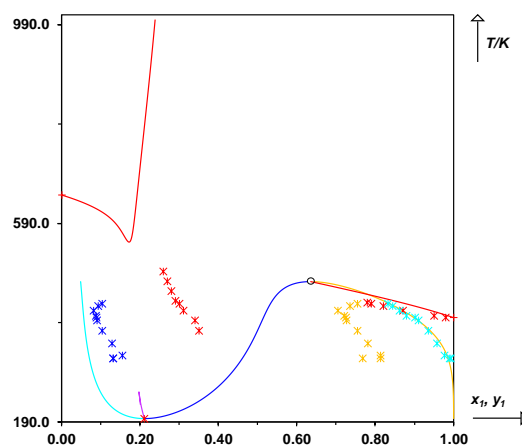
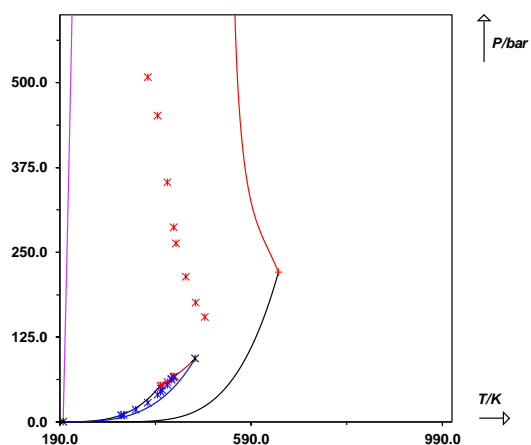
$$\text{MAPE on } x_c = 126 \%$$

$$\text{MAPE on } P_c = 68 \%$$

$$\text{MAPE on } x_{\text{LLV}} = 35 \%$$

$$\text{MAPE on } P_{\text{LLV}} = 26 \%$$

$$\text{MAPE on } h^{\text{M}} = 77 \%$$



Isothermal phase equilibrium data			P / bar	x ₁	y ₁		
-----			1.370	0.0066	0.7846		
-----			1.790	0.0093	0.8384		
Song, H.J. - Zhang, H.T. - Ying, W.Y., Study on vapor-liquid equilibrium for dimethyl ether/methanol binary system, Tianranqi Huagong. 30 (2005) 67-71.			2.050	0.0111	0.8625		
T / K = 309.15			2.530	0.0148	0.8747		
P / bar	x ₁	y ₁	2.890	0.0188	0.8956		
1.260	0.0137	0.9345	4.740	0.0355	0.9351		
1.580	0.0175	0.9465	5.950	0.0416	0.9448		
1.950	0.0218	0.9516	6.320	0.0459	0.9485		
2.260	0.0264	0.9547	7.160	0.0554	0.9496		
2.580	0.0306	0.9585	7.740	0.0628	0.9513		
2.890	0.0354	0.9619	8.530	0.0746	0.9551		
3.160	0.0398	0.9658	9.260	0.0891	0.9606		
3.420	0.0443	0.9704	Poza, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030				
3.630	0.0486	0.9756	T / K = 348.15				
4.050	0.0573	0.9815	P / bar	x ₁ ^a	x ₁ ^b	y ₁	
Laursen, T. - Rasmussen, P. - Andersen, S.I., VLE and VLE Measurements of Dimethyl Ether Containing Systems, J. Chem. Eng. Data. 47 (2002) 198-202. doi:10.1021/je010154+			3.240	0.0110	-	0.8500	
T / K = 318.15			4.000	0.0150	-	0.8780	
P / bar	x ₁	y ₁	5.520	0.0190	-	0.9130	
9.400	0.1317	0.9921	8.070	0.0280	-	0.9330	
9.400	0.8139	0.9921	9.450	0.0430	-	0.9410	
9.400	0.1309	0.9900	13.24	0.0710	-	0.9560	
9.400	0.7683	0.9900	15.93	0.0870	-	0.9570	
Song, H.J. - Zhang, H.T. - Ying, W.Y., Study on vapor-liquid equilibrium for dimethyl ether/methanol binary system, Tianranqi Huagong. 30 (2005) 67-71.			18.00	0.1280	0.7810	0.9580	3PL
T / K = 323.15			18.82	-	0.9070	0.9720	
P / bar	x ₁	y ₁	20.20	-	0.9910	0.9940	
1.530	0.0094	0.9012	Song, H.J. - Zhang, H.T. - Ying, W.Y., Study on vapor-liquid equilibrium for dimethyl ether/methanol binary system, Tianranqi Huagong. 30 (2005) 67-71.				
1.890	0.0123	0.9167	T / K = 348.15				
2.420	0.0182	0.9328	P / bar	x ₁	y ₁		
2.890	0.0247	0.9408	1.530	0.0048	0.6756		
3.420	0.0326	0.9485	2.000	0.0069	0.7508		
3.890	0.0381	0.9539	2.530	0.0093	0.7948		
4.890	0.0480	0.9594	3.740	0.0137	0.8713		
5.740	0.0562	0.9639	3.890	0.0146	0.8752		
6.320	0.0631	0.9646	5.160	0.0180	0.9049		
7.050	0.0756	0.9648	6.370	0.0216	0.9223		
7.680	0.0854	0.9652	7.420	0.0247	0.9280		
Song, H.J. - Zhang, H.T. - Ying, W.Y., Study on vapor-liquid equilibrium for dimethyl ether/methanol binary system, Tianranqi Huagong. 30 (2005) 67-71.			8.680	0.0336	0.9368		
T / K = 333.15			9.680	0.0453	0.9423		
P / bar	x ₁	y ₁	10.63	0.0539	0.9466		
1.530	0.0094	0.9012	11.68	0.0615	0.9499		
1.890	0.0123	0.9167	12.32	0.0655	0.9524		
2.420	0.0182	0.9328					
2.890	0.0247	0.9408					
3.420	0.0326	0.9485					
3.890	0.0381	0.9539					
4.890	0.0480	0.9594					
5.740	0.0562	0.9639					
6.320	0.0631	0.9646					
7.050	0.0756	0.9648					
7.680	0.0854	0.9652					

SA-HA systems (BAC = 8)

Song, H.J. - Zhang, H.T. - Ying, W.Y., Study on vapor-liquid equilibrium for dimethyl ether/methanol binary system, Tianranqi Huagong. 30 (2005) 67-71.

T / K = 358.15

P / bar	x ₁	y ₁
2.050	0.0052	0.6436
2.580	0.0068	0.7203
3.050	0.0103	0.7678
4.160	0.0126	0.8236
4.580	0.0135	0.8408
5.370	0.0146	0.8649
7.000	0.0225	0.8897
7.740	0.0243	0.8988
8.950	0.0306	0.9083
10.37	0.0398	0.9181
11.42	0.0469	0.9248
12.74	0.0533	0.9317
14.16	0.0605	0.9370

Song, H.J. - Zhang, H.T. - Ying, W.Y., Study on vapor-liquid equilibrium for dimethyl ether/methanol binary system, Tianranqi Huagong. 30 (2005) 67-71.

T / K = 373.15

P / bar	x ₁	y ₁
2.790	0.0065	0.6166
3.740	0.0071	0.7003
3.890	0.0072	0.7116
4.580	0.0075	0.7554
5.320	0.0079	0.7926
5.950	0.0097	0.8136
6.320	0.0125	0.8242
7.370	0.0191	0.8449
8.260	0.0198	0.8632
9.110	0.0204	0.8653
10.58	0.0223	0.8801
11.35	0.0250	0.8876
12.95	0.0313	0.8996

Pozo, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030

T / K = 373.26

P / bar	x ₁ ^a	x ₁ ^β	y ₁
3.450	0.0070	-	0.6840
5.650	0.0080	-	0.8030
7.170	0.0180	-	0.8410
9.790	0.0210	-	0.8720
13.72	0.0340	-	0.9050
17.44	0.0440	-	0.9150

20.62	0.0540	-	0.9250
24.41	0.0650	-	0.9310
28.48	0.1040	0.7550	0.9360
28.61	-	0.7770	0.9410
29.58	-	0.8550	0.9500
31.10	-	0.9340	0.9670
508.00	0.3500	0.3500	-

3PL

CRIT

Song, H.J. - Zhang, H.T. - Ying, W.Y., Study on vapor-liquid equilibrium for dimethyl ether/methanol binary system, Tianranqi Huagong. 30 (2005) 67-71.

T / K = 393.15

P / bar	x ₁	y ₁
3.950	0.0024	0.4629
4.370	0.0032	0.5148
4.680	0.0035	0.5446
5.110	0.0045	0.5762
5.740	0.0050	0.6156
7.890	0.0081	0.7352
9.630	0.0126	0.7629
11.58	0.0137	0.7931
13.00	0.0169	0.8136
15.68	0.0226	0.8411
17.16	0.0253	0.8521
18.42	0.0271	0.8568
21.68	0.0305	0.8697

Pozo, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030

T / K = 394.21

P / bar	x ₁ ^a	x ₁ ^β	y ₁
4.960	0.0040	-	0.5630
7.310	0.0070	-	0.6970
9.100	0.0120	-	0.7490
11.10	0.0130	-	0.7850
13.79	0.0190	-	0.8180
17.79	0.0260	-	0.8520
22.20	0.0310	-	0.8710
26.20	0.0430	-	0.8810
28.61	0.0480	-	0.8840
35.65	0.0690	-	0.8990
40.54	0.0900	0.7270	0.9100
41.51	-	0.8060	0.9180
42.20	-	0.8510	0.9220
43.99	-	0.8980	0.9380
46.06	-	0.9490	0.9690
451.00	0.3400	0.3400	-

3PL

CRIT

SA-HA systems (BAC = 8)

Pozo, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030

T / K = 403.26

P / bar	x_1^a	x_1^b	y_1	
5.860	0.0030	-	0.5180	
7.240	0.0050	-	0.6110	
8.480	0.0060	-	0.6620	
9.450	0.0080	-	0.6870	
10.14	0.0100	-	0.7050	
12.82	0.0120	-	0.7450	
17.72	0.0200	-	0.8110	
24.27	0.0290	-	0.8350	
31.16	0.0400	-	0.8630	
37.09	0.0530	-	0.8750	
41.23	0.0670	-	0.8770	
46.61	0.0870	0.7210	0.8790	3PL
47.09	-	0.7780	0.8900	
48.13	-	0.8190	0.8950	
50.81	-	0.8550	0.9190	
50.12	-	0.8710	0.9150	
50.81	-	0.8850	0.9190	
52.26	-	0.9170	0.9360	
53.30	-	0.9360	0.9480	
54.00	-	0.9500	0.9500	CRIT

Pozo, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030

T / K = 414.00

P / bar	x_1^a	x_1^b	y_1	
5.790	0.0010	-	0.3550	
6.620	0.0020	-	0.4410	
7.580	0.0030	-	0.5080	
9.790	0.0040	-	0.5900	
13.38	0.0100	-	0.6830	
16.55	0.0110	-	0.7410	
21.37	0.0170	-	0.7840	
30.61	0.0270	-	0.8170	
37.09	0.0350	-	0.8450	
43.51	0.0510	-	0.8540	
48.95	0.0670	-	0.8590	
54.54	0.0810	0.7050	0.8620	3PL
56.81	-	0.8030	0.8740	
58.05	-	0.8290	0.8760	
59.09	-	0.8520	0.8730	
59.29	-	0.8660	0.8720	

59.00 - 0.8700 0.8700 CRIT

Pozo, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030

T / K = 423.50

P / bar	x_1^a	x_1^b	y_1	
6.140			0.2110	
6.830			0.2970	
7.450			0.3420	
8.410			0.4040	
10.34	0.0050	-	0.4930	
11.17	0.0060	-	0.5200	
13.51	0.0080	-	0.5920	
15.86	0.0120	-	0.6430	
20.55	0.0170	-	0.7100	
22.06	0.0180	-	0.7240	
25.58	0.0250	-	0.7570	
31.72	0.0330	-	0.7830	
37.65	0.0400	-	0.8080	
43.99	0.0540	-	0.8120	
51.30	0.0560	-	0.8290	
58.19	0.0820	-	0.8390	
62.19	0.0930	0.7360	0.8440	3PL
62.81	-	0.7640	0.8450	
63.91	-	0.7940	0.8410	
64.19	-	0.8150	0.8340	
64.00	-	0.8200	0.8200	CRIT

Isobaric phase equilibrium data

Holldorff, H. - Knapp, H., Binary vapor-liquid-liquid equilibrium of dimethyl ether - water and mutual solubilities of methyl chloride and water: Experimental results and data reduction, Fluid Phase Equilibria. 44 (1988) 195-209. doi:10.1016/0378-3812(88)80111-0

P / bar = 1.0000

T / K	x_1^a	x_1^b
253.7	-	0.9015
255.1	-	0.8988
259.3	0.2081	-
263.7	-	0.8854
265.8	0.205	-
270.4	0.2027	-
272.5	0.2021	-
273.5	-	0.8717
274.3	-	0.8706
278.1	0.1967	-

SA-HA systems (BAC = 8)

279.5	0.1961	-	Pozo, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030		
280.4	0.1972	-			
282.50	0.194	-			
283.50	-	0.8577			
284.00	0.1915	-	T / K	P / bar	x ₁
289.20	0.1884	-	400.49	53.00	0.9800
289.90	0.1851	-	414.01	353.00	0.3100
293.30	-	0.8446	427.40	287.00	0.3000
293.60	-	0.8448	427.40	66.00	0.7900
295.70	0.1795	-	430.15	67.20	0.7800
299.20	0.1735	-	433.20	263.00	0.2900
303.00	-	0.8332	453.30	214.00	0.2800
306.40	0.1635	-	473.60	176.00	0.2700
312.60	-	0.8231	493.16	155.00	0.2600
312.90	-	0.8224			
314.10	0.1528	-			
319.60	0.1462	-			
319.90	0.1451	-			
321.10	-	0.8143			

Three-phase line

Pozo, Maria E. - Streett, William B., Fluid phase equilibria for the system dimethyl ether/water from 50 to 220.degree.C and pressures to 50.9 MPa, Journal of Chemical & Engineering Data. 29 (1984) 324-329. doi:10.1021/je00037a030

T / K	P / bar	x ₁ ^a	x ₁ ^β	y ₁
323.15	10.27	0.1550	0.8140	0.9770
400.49	44.40	0.0890	0.7250	0.9010
427.40	66.05	0.1040	0.7550	0.8320

Enthalpy of mixing

Park, So-Jin - Han, Kyu-Jin - Gmehling, Jürgen, Isothermal Phase Equilibria and Excess Molar Enthalpies for Binary Systems with Dimethyl Ether at 323.15 K, Journal of Chemical & Engineering Data. 52 (2007) 1814-1818. doi:10.1021/je700174h

T / K = 323.15

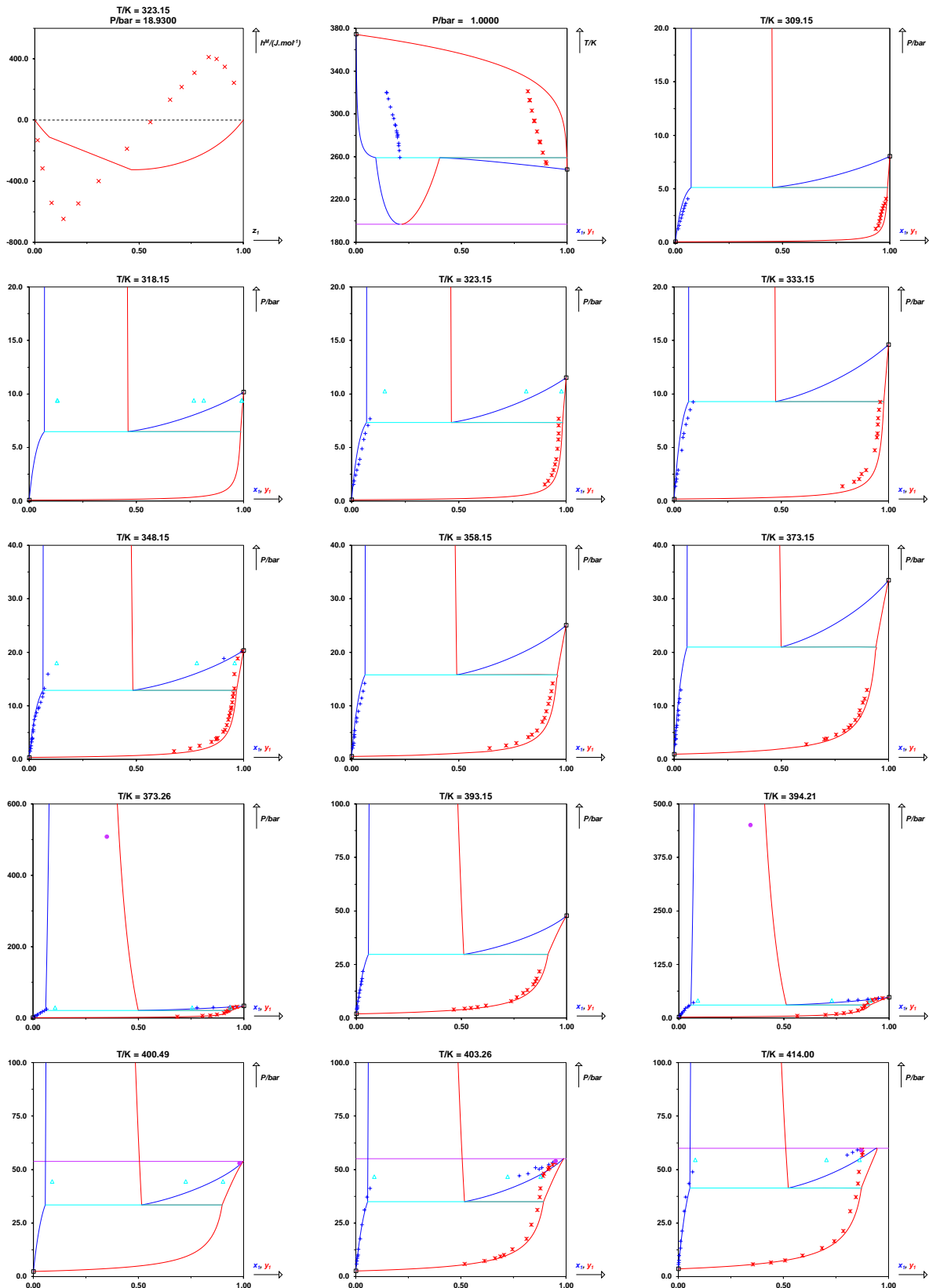
P / bar = 18.93

h^M / J.mol⁻¹

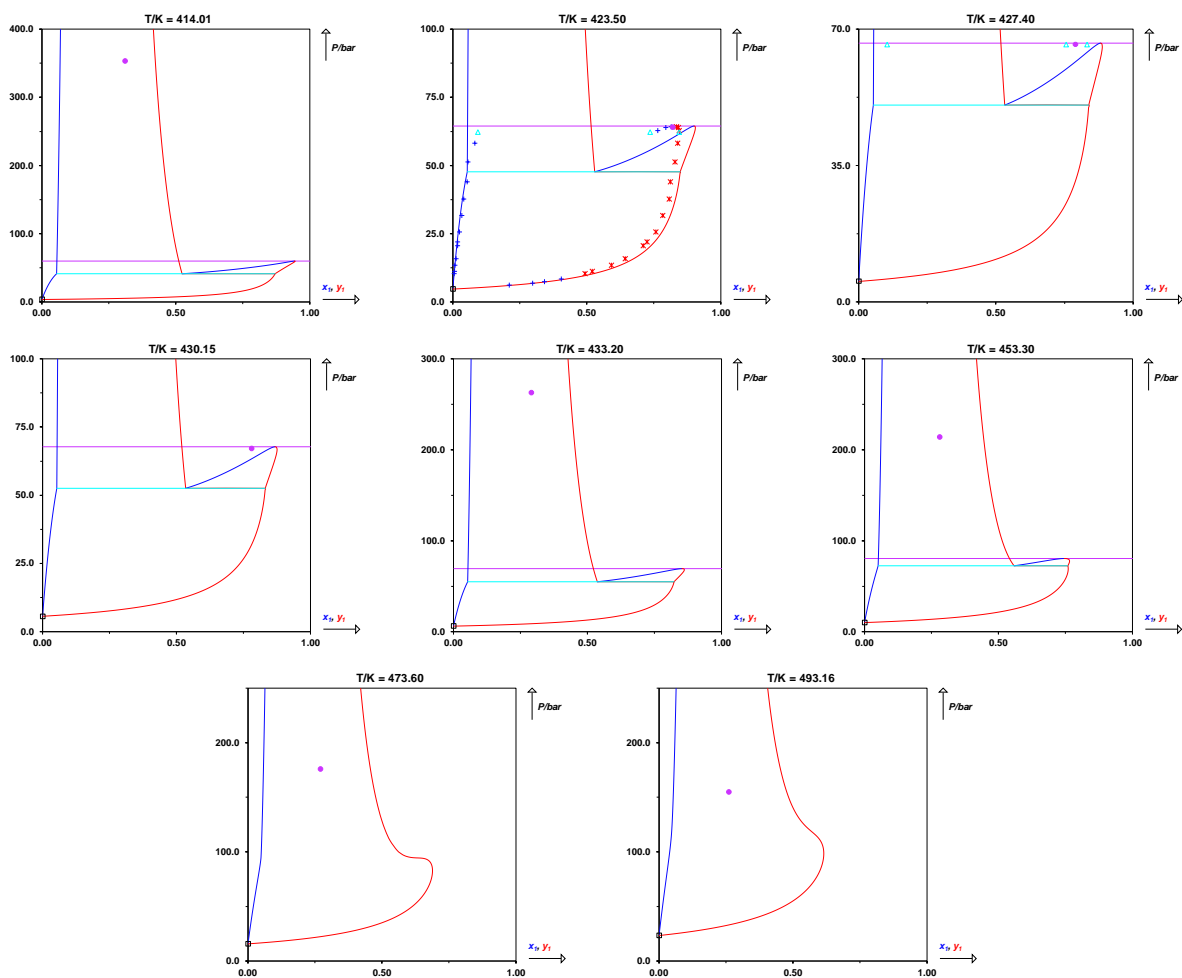
z ₁	h ^M / J.mol ⁻¹
0.0137	-131.64
0.0363	-316.77
0.0808	-542.52
0.1366	-646.32
0.2087	-547.04
0.3054	-399.40
0.4418	-187.92
0.5543	-14.71
0.6487	132.12
0.7036	215.55
0.7649	307.98
0.8337	412.57
0.8713	399.51
0.9114	348.00
0.9542	242.54

Critical point

SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



ACETONE (1) + WATER (2)

CAS	67-64-1	7732-18-5
InChiKey	CSCPPACGZOO CGX-UHFFFAOYSA-N	XLYOFNOQVPJJNP-UHFFFAOYSA-N
T_c / K	508.20	647.10
P_c / bar	47.01	220.64
ω	0.307	0.345

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 266.1$$

$$B/\text{MPa} = 26.57$$

Deviations

$$\text{MAPE on } x = 86\%$$

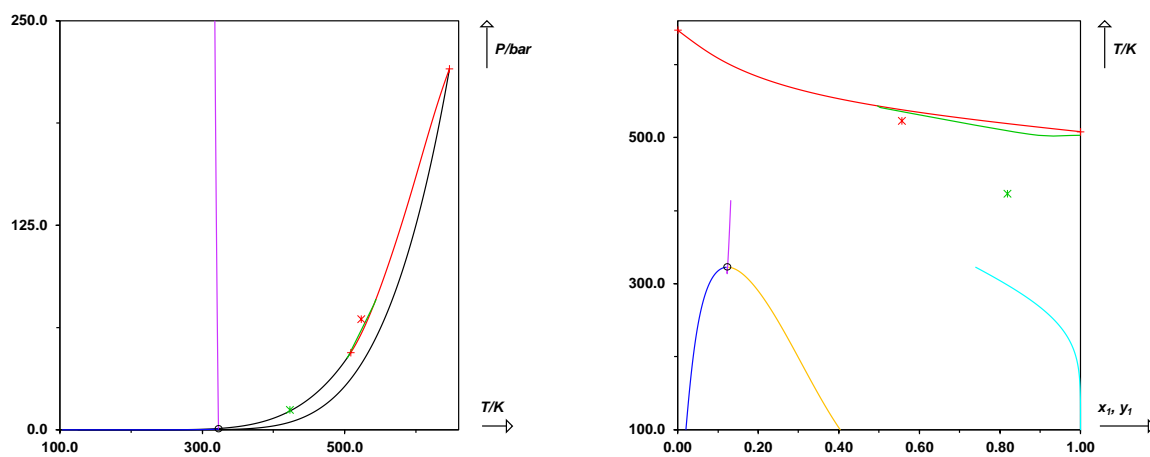
$$\text{MAPE on } y = 32\%$$

$$\text{MAPE on } x_c = 41\%$$

$$\text{MAPE on } P_c = 13\%$$

$$\text{MAPE on } h^M = 74\%$$

$$\text{MAPE on } c_p^M = 199\%$$



-----			P / bar	x ₁	y ₁
Isothermal phase equilibrium data			0.1127	0.0201	0.5148
-----			0.2469	0.0918	0.7805
Pierotti, G. J. - Deal, C. H. - Derr, E. L., Activity Coefficients and Molecular Structure, Industrial & Engineering Chemistry. 51 (1959) 95-102. doi:10.1021/ie50589a048			0.2694	0.1135	0.8103
T / K = 288.15			0.3337	0.2084	0.8585
P / bar	x ₁	y ₁	0.3717	0.3260	0.8691
0.0280	0.0085	0.4040	0.3848	0.4171	0.8798
0.0513	0.0284	0.6760	0.3990	0.5314	0.8870
0.0793	0.0640	0.7670	0.4080	0.6141	0.8853
			0.4229	0.7273	0.9074
			0.4321	0.8016	0.9234
			0.4517	0.9452	0.9770
Im, J.N. - Park, S.S. - Lee, H.O., Isothermal vapor-liquid equilibrium for the binary system acetone-water by the total pressure method, Korean Chemical Engineering Research. 12 (1974) 179-187.			Lieberwirth, I. - Schuberth, H., Das isotherme Dampf-Flüssigkeits-Phasengleichgewichtsverhalten des Systems Aceton/Wasser bei 35° C, Zeitschrift für Physikalische Chemie. 2600 (1979) doi:10.1515/zpch-1979-26090		
T / K = 288.15			T / K = 308.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.0401	0.0201	0.5980	0.1833	0.0500	0.7060
0.0961	0.0918	0.8481	0.2668	0.1000	0.8160
0.1076	0.1135	0.8647	0.3102	0.1500	0.8440
0.1388	0.2084	0.9056	0.3374	0.2000	0.8590
0.1607	0.3260	0.9061	0.3541	0.2500	0.8710
0.1677	0.4171	0.9188	0.3658	0.3000	0.8780
0.1733	0.5314	0.9284	0.3738	0.3500	0.8820
0.1771	0.6141	0.9290	0.3798	0.4000	0.8850
0.1813	0.7273	0.9327	0.3853	0.4500	0.8880
0.1843	0.8016	0.9390	0.3909	0.5000	0.8920
0.1909	0.9452	0.9776	0.3973	0.5500	0.8970
Treiner, Claude - Tzias, Pierre, Standard Gibbs Free Energy of Transfer of n-Bu4NBr from Water to Water-Organic Solvent Mixtures as Deduced from Precise Vapor Pressure Measurements at 298.15°K, Thermodynamic Behavior of Electrolytes in Mixed Solvents. 155 (1976) 303-317.			0.4034	0.6000	0.9010
T / K = 298.15			0.4098	0.6500	0.9070
P / bar	x ₁	y ₁	0.4165	0.7000	0.9130
0.0652	0.0158	0.5217	0.4233	0.7500	0.9200
0.0837	0.0261	0.6133	0.4305	0.8000	0.9290
0.1054	0.0404	0.6984	0.4382	0.8500	0.9390
0.1378	0.0711	0.8060	0.4469	0.9000	0.9530
0.1893	0.1172	0.8477	0.4561	0.9500	0.9720
0.2145	0.1713	0.8688	Sokolova, E.P. - Morachevskii, A.G., Thermodynamic properties of the acetone-water system, Vestn Lenin U. Fiz. Kh. (1967) 110-115.		
0.2298	0.2372	0.8809	T / K = 308.15		
0.2441	0.3183	0.8901	P / bar	x ₁	y ₁
0.2665	0.5572	0.9074	0.1832	0.0490	0.7130
Im, J.N. - Park, S.S. - Lee, H.O., Isothermal vapor-liquid equilibrium for the binary system acetone-water by the total pressure method, Korean Chemical Engineering Research. 12 (1974) 179-187.			0.2893	0.1260	0.8230
T / K = 308.15			0.3349	0.1970	0.8530
			0.3686	0.2980	0.8720
			0.3921	0.4500	0.8810
			0.4040	0.5720	0.8880

SA-HA systems (BAC = 8)

0.4320 0.7840 0.9160
0.4512 0.9010 0.9510

11.82 0.9120 0.9020
11.61 0.9600 0.9570
11.56 0.9700 0.9680

Im, J.N. - Park, S.S. - Lee, H.O., Isothermal vapor-liquid equilibrium for the binary system acetone-water by the total pressure method, Korean Chemical Engineering Research. 12 (1974) 179-187.

T / K = 318.15
P / bar x₁ y₁
0.1909 0.0201 0.4716
0.3773 0.0918 0.7743
0.4197 0.1135 0.7844
0.5069 0.2084 0.8347
0.5537 0.3260 0.8492
0.5698 0.4171 0.8606
0.5922 0.5314 0.8657
0.6054 0.6141 0.8758
0.6237 0.7273 0.8967
0.6386 0.8016 0.9133
0.6698 0.9452 0.9669

Griswold, J. - Wong, S.Y., Phase-equilibria in the acetone-methanol-water system from 100° into the critical region, Chemical Engineering Progress Symposium Series. 48 (1952) 18-34.

T / K = 523.15
P / bar x₁ y₁
40.40 0.0020 0.0150
40.96 0.0040 0.0250
41.78 0.0070 0.0390
46.61 0.0260 0.1380
55.43 0.1040 0.2920
60.40 0.2270 0.3630
63.02 0.2850 0.3920
63.36 0.2960 0.4000
65.43 0.4010 0.4620
65.78 0.4120 0.4660
66.88 0.4960 0.5210
67.57 0.5560 0.5560 CRIT

Sokolova, E.P. - Morachevskii, A.G., Thermodynamic properties of the acetone-water system, Vestn Lenin U. Fiz. Kh. (1967) 110-115.

T / K = 323.15
P / bar x₁ y₁
0.4038 0.0570 0.7100
0.4512 0.0760 0.7430
0.6072 0.1880 0.8210
0.6602 0.2980 0.8430
0.7018 0.4500 0.8540
0.7259 0.5720 0.8670
0.7679 0.7840 0.9000
0.7869 0.9010 0.9400

Isobaric phase equilibrium data

Verhoeve, Lucien - De Schepper, Herman, The vapour-liquid equilibria of the binary, ternary and quaternary systems formed by acetone, methanol, propan-2-ol, and water, Journal of Applied Chemistry and Biotechnology. 23 (2007) 607-619. doi:10.1002/jctb.5020230807

P / bar = 1.013
T / K x₁ y₁
349.40 0.0490 0.6050
345.55 0.0690 0.6780
339.60 0.1270 0.7530
335.90 0.2000 0.7900
335.49 0.2760 0.8040
334.05 0.4000 0.8260
333.32 0.4950 0.8320
331.95 0.6500 0.8550
331.62 0.6940 0.8620
331.10 0.7500 0.8760
330.40 0.8290 0.9030
329.90 0.9000 0.9360
329.60 0.9400 0.9590

Griswold, J. - Wong, S.Y., Phase-equilibria in the acetone-methanol-water system from 100° into the critical region, Chemical Engineering Progress Symposium Series. 48 (1952) 18-34.

T / K = 423.15
P / bar x₁ y₁
6.722 0.0240 0.2950
9.373 0.1630 0.5250
11.68 0.5780 0.6770
11.89 0.6860 0.7310
11.95 0.7220 0.7500
12.02 0.7630 0.7770
12.00 0.8180 0.8180 AZEO
12.01 0.8180 0.8210
11.99 0.8540 0.8450
11.90 0.8870 0.8770

Ochi, K. - Kojima, K., Vapor-liquid equilibria for the system acetone + methanol + water, Kagaku Kogaku. 35 (1971) 583-586. doi:10.1252/kakoronbunshu1953.35.583
P / bar = 1.013

SA-HA systems (BAC = 8)

T / K	x ₁	y ₁			
360.60	0.0164	0.3547	338.41	0.1500	0.7716
352.33	0.0346	0.5472	336.74	0.2000	0.7916
346.57	0.0573	0.6377	335.75	0.2500	0.8034
343.06	0.0826	0.7047	335.02	0.3000	0.8124
340.93	0.1044	0.7286	334.41	0.3500	0.8201
339.15	0.1337	0.7535	333.90	0.4000	0.8269
338.71	0.1446	0.7578	333.50	0.4500	0.8326
338.41	0.1511	0.7586	333.10	0.5000	0.8387
338.06	0.1576	0.7713	332.69	0.5500	0.8455
337.61	0.1708	0.7736	332.27	0.6000	0.8532
337.20	0.1851	0.7798	331.86	0.6500	0.8615
337.00	0.1923	0.7781	331.44	0.7000	0.8712
336.56	0.2122	0.7821	331.05	0.7500	0.8817
335.28	0.2836	0.7965	330.64	0.8000	0.8950
334.91	0.3115	0.8034	330.23	0.8500	0.9118
334.75	0.3264	0.8060	329.83	0.9000	0.9335
334.47	0.3495	0.8100	329.45	0.9500	0.9627
333.97	0.3989	0.8169			
333.98	0.3998	0.8186			
333.78	0.4212	0.8169			
333.56	0.4473	0.8195			
333.46	0.4510	0.8252			
333.27	0.4806	0.8284			
333.09	0.5060	0.8275			
332.98	0.5184	0.8287			
332.96	0.5212	0.8301			
332.93	0.5244	0.8323			
332.65	0.5574	0.8342			
332.38	0.5911	0.8409			
331.97	0.6409	0.8476			
331.55	0.6932	0.8584			
331.46	0.7207	0.8621			
331.15	0.7417	0.8697			
330.73	0.7856	0.8811			
330.61	0.7996	0.8892			
330.19	0.8469	0.9045			
329.79	0.8956	0.9184			
329.58	0.9307	0.9443			
329.42	0.9472	0.9581			
329.21	0.9867	0.9878			

Othmer, Donald F. - Chudgar, Manu M. - Levy, Sherman L., Binary and Ternary Systems of Acetone, Methyl Ethyl Ketone, and Water, Industrial & Engineering Chemistry. 44 (1952) 1872-1881. doi:10.1021/ie50512a042

P / bar = 3.447

T / K	x ₁	y ₁
395.65	0.0170	0.3490
393.15	0.0240	0.3980
385.15	0.0550	0.5180
379.15	0.1070	0.6080
375.95	0.1940	0.6700
374.45	0.2730	0.6950
373.05	0.3880	0.7180
372.15	0.5450	0.7470
371.95	0.6330	0.7680
371.75	0.7780	0.8300
371.55	0.8900	0.9030
371.35	0.9500	0.9510

Enthalpy of mixing

French, H.T, Excess enthalpies of (acetone + water) at 278.15, 288.15, 298.15, 308.15, 318.15, and 323.15 K, The Journal of Chemical Thermodynamics. 21 (1989) 801-809. doi:10.1016/0021-9614(89)90026-8

T / K = 278.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
-24.00	0.0019
-73.00	0.0061
-122.00	0.0104
-168.00	0.0147

Kojima, K. - Tochigi, K. - Seki, H. - Watase, K., Determination of vapor-liquid equilibriums from boiling point curves, Kagaku Kogaku. 32 (1968) 149-153. doi:10.1252/kakoronbunshu1953.32.149

P / bar = 1.013

T / K	x ₁	y ₁
347.95	0.0500	0.6381
341.68	0.1000	0.7301

SA-HA systems (BAC = 8)

		$h^M / \text{J.mol}^{-1}$	z_1
-213.00	0.0190		
-276.00	0.0255	-416.40	0.0460
-353.00	0.0342	-661.00	0.0990
-424.00	0.0431	-756.00	0.1510
-487.00	0.0522	-772.90	0.1950
-544.00	0.0613	-743.90	0.2480
-592.00	0.0704	-672.60	0.3050
-636.00	0.0797	-590.50	0.3490
-672.00	0.0887	-601.40	0.3500
-715.00	0.1024	-501.90	0.4040
-762.00	0.1215	-416.60	0.4480
-792.00	0.1414	-317.00	0.4970
-810.00	0.1618	-211.90	0.5480
-817.00	0.1820	-103.50	0.6020
-815.00	0.2025	-12.30	0.6500
-805.00	0.2233	72.40	0.6990
-788.00	0.2440	147.10	0.7520
-771.00	0.2597	199.50	0.8010
-753.00	0.2654	228.80	0.8530
-758.00	0.2707	203.50	0.9010
-731.00	0.2817	144.20	0.9480
-705.00	0.2995		
-673.00	0.3192		
-638.00	0.3396		
-596.00	0.3620		
-547.00	0.3879		
-489.00	0.4167		
-421.00	0.4495		
-342.00	0.4868		
-251.00	0.5294		
-161.00	0.5715		
-77.00	0.6121		
-1.0000	0.6504		
61.00	0.6844		
122.00	0.7212		
178.00	0.7627		
221.00	0.8087		
238.00	0.8486		
230.00	0.8857		
195.00	0.9225		
140.00	0.9532		
56.00	0.9841		

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 293.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1
-223.52	0.0264
-453.88	0.0576
-632.32	0.0948
-732.67	0.1400
-764.12	0.1963
-687.30	0.2682
-494.27	0.3631
-185.10	0.4942
189.62	0.6874
248.83	0.7375
277.32	0.7928
255.16	0.8543
109.05	0.9229

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochemica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 283.15

P / bar = 4.000

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 298.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1		
-209.00	0.0264	-83.37	0.3631
-422.81	0.0576	169.28	0.4942
-590.23	0.0948	438.53	0.6874
-685.63	0.1400	450.01	0.7375
-708.45	0.1963	401.52	0.7928
-624.30	0.2682	296.98	0.8543
-422.46	0.3631	48.05	0.9229

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 308.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1	$h^M / \text{J.mol}^{-1}$	z_1
-182.37	0.0264	-173.10	0.0460
-384.16	0.0576	-216.70	0.0990
-506.93	0.0948	-207.90	0.1510
-591.39	0.1400	-169.80	0.1950
-612.93	0.1963	-103.90	0.2480
-514.77	0.2682	-13.30	0.3050
-329.22	0.3631	65.10	0.3500
-7.000	0.4942	163.40	0.4040
345.44	0.6874	247.30	0.4480
376.48	0.7375	333.70	0.4970
379.60	0.7928	413.50	0.5480
314.29	0.8543	491.60	0.6020
116.39	0.9229	542.20	0.6500
		577.50	0.6990
		586.60	0.7520
		560.90	0.8010
		502.00	0.8530
		383.40	0.9010
		227.50	0.9480

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 323.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$	z_1	$h^M / \text{J.mol}^{-1}$	z_1
-138.31	0.0264	65.10	0.3500
-281.67	0.0577	163.40	0.4040
-381.66	0.0948	247.30	0.4480
-418.33	0.1400	333.70	0.4970
-365.36	0.1963	413.50	0.5480
-255.19	0.2682	491.60	0.6020
		542.20	0.6500
		577.50	0.6990
		586.60	0.7520
		560.90	0.8010
		502.00	0.8530
		383.40	0.9010
		227.50	0.9480

Heat capacity of mixing

Costas, Miguel - Patterson, Donald, Heat capacities of water + organic-solvent mixtures, Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases. 81 (1985) doi:10.1039/f19858102381

T / K = 298.15

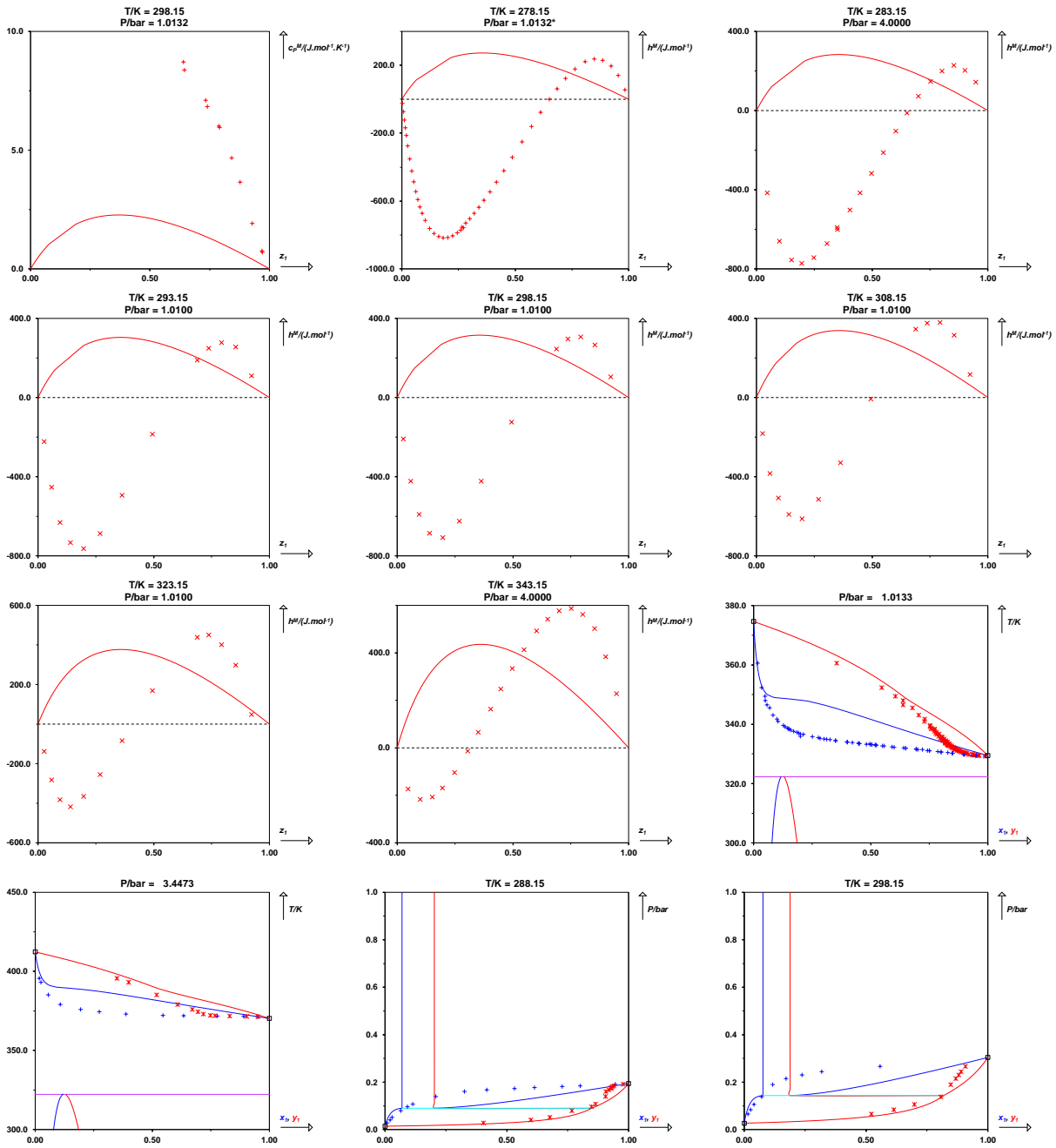
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
8.711	0.6393
8.377	0.6443
7.100	0.7336
6.833	0.7407
6.007	0.7881

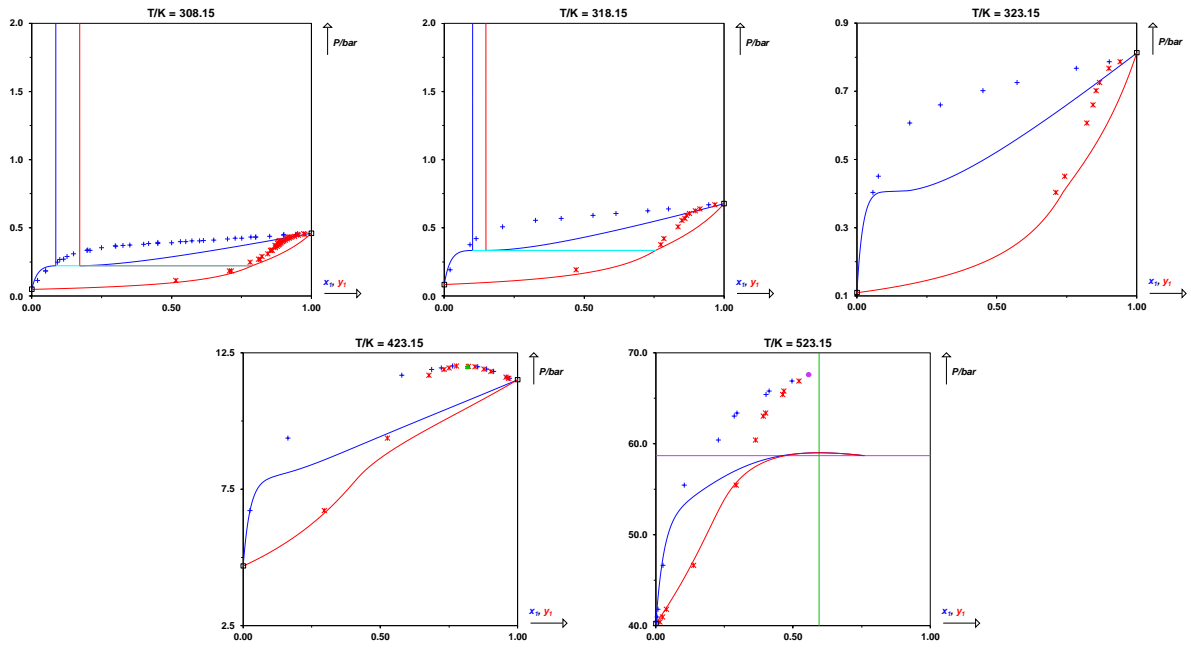
SA-HA systems (BAC = 8)

5.961	0.7912
4.662	0.8417
3.644	0.8775
1.910	0.9286
0.7597	0.9688
0.6918	0.9705

SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



CARBON MONOXIDE (1) + METHANOL (2)

CAS	630-08-0	67-56-1
InChiKey	WSFSSNUMVMOOMR-UHFFFAOYSA-N	OKKJLVBELUTLKV-UHFFFAOYSA-N
T_c / K	132.92	512.50
P_c / bar	34.99	80.84
ω	0.048	0.566

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 222.3$

$B/\text{MPa} = 234.1$

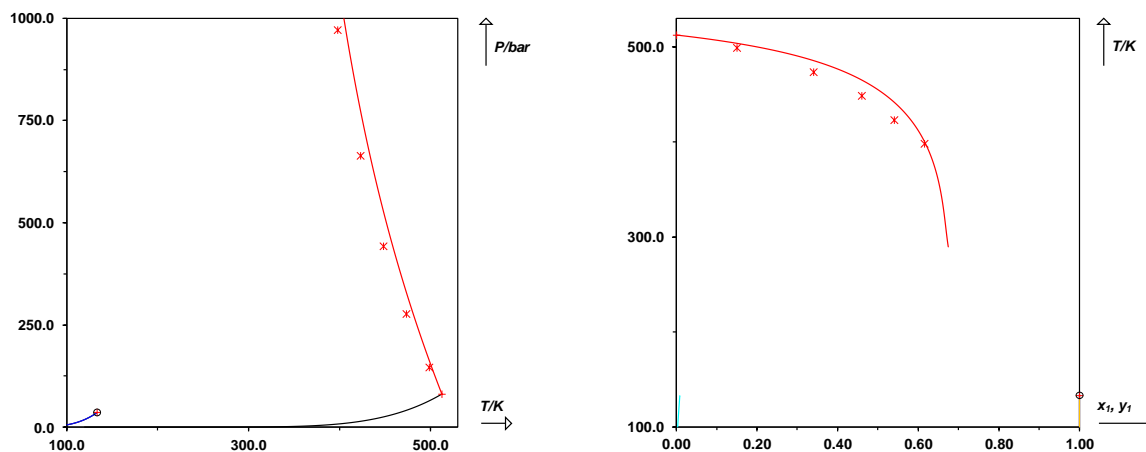
Deviations

MAPE on $x = 8.3\%$

MAPE on $y = 18\%$

MAPE on $x_c = 13\%$

MAPE on $P_c = 16\%$



Isothermal phase equilibrium data

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 298.15

P / bar	y_1
24.00	0.9911
36.00	0.9934
50.00	0.9948
55.00	0.9950
100.00	0.9964
600.00	0.9945
800.00	0.9891
1000.0	0.9862

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 298.15

P / bar	x_1
22.82	0.0082
45.43	0.0164
68.79	0.0246
93.41	0.0327
144.90	0.0484
244.30	0.0768
331.00	0.0988
469.00	0.1298
849.00	0.2030
1007.0	0.2323

Li, N. - Ma, P. - Xia, S., Determination of Solubility of Carbon Monoxide in Methanol-Dimethyl Carbonate under High Pressure, Shiyou Huagong. 34 (2005) 60-64.

T / K = 298.15

P / bar	x_1
80.30	0.0267
61.30	0.0207
40.00	0.0140
20.20	0.0088

Krichevskii, I.R. - Zhavoronkov, N.M. - Tsiklis, D.S., Solubility of hydrogen, carbon monoxide and of their

mixtures in methanol at high pressures, Zh. Fiz. Khim. 9 (1937) 317-328.

T / K = 298.15

P / bar	x_1
60.80	0.0191
67.89	0.0217
111.46	0.0358
182.39	0.0556
188.46	0.0559
244.19	0.0757
246.22	0.0769

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 323.15

P / bar	y_1
50.00	0.9842
100.00	0.9895
200.00	0.9909
400.00	0.9883
600.00	0.9841
800.00	0.9792
1000.0	0.9742

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 323.15

P / bar	x_1
43.57	0.0156
65.28	0.0233
87.13	0.0310
112.40	0.0394
237.80	0.0779
373.00	0.1155
577.00	0.1667
817.00	0.2158
990.00	0.2539

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

SA-HA systems (BAC = 8)

T / K =	373.15	601.00	0.8705
P / bar	γ_1	477.00	0.8980
100.00	0.9395	403.80	0.9023
200.00	0.9538	311.10	0.9076
300.00	0.9544	195.50	0.9019
400.00	0.9504	109.90	0.8846
600.00	0.9371	72.80	0.8517
800.00	0.9191		
1000.0	0.8944		

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 373.15

P / bar	x_1
21.35	0.0072
40.06	0.0147
57.85	0.0216
76.68	0.0287
93.80	0.0356
113.10	0.0430
150.10	0.0568
186.40	0.0737
286.50	0.1064
379.00	0.1400
530.50	0.1900
738.00	0.2599
893.00	0.3132

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 398.15

P / bar	γ_1	CRIT
971.00	0.6161	CRIT
971.00	0.6278	
970.00	0.6429	
965.00	0.6777	
961.00	0.7049	
934.00	0.7430	
914.00	0.7653	
830.00	0.8098	
762.00	0.8359	
718.00	0.8459	
667.00	0.8570	

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 398.15

P / bar	x_1
72.00	0.0291
161.80	0.0672
276.50	0.1174
444.00	0.1807
582.00	0.2402
707.00	0.3028
862.00	0.3961
904.00	0.4338
931.00	0.4636
954.00	0.4851
960.00	0.5036
967.00	0.5485
969.00	0.5942
968.00	0.5994

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 423.15

P / bar	γ_1	CRIT
664.00	0.5400	CRIT
664.00	0.5538	
663.00	0.5650	
658.00	0.6306	
653.00	0.6512	
549.00	0.7723	
450.00	0.8160	
331.00	0.8361	
273.30	0.8435	
220.00	0.8375	
121.50	0.8043	
116.60	0.7964	

SA-HA systems (BAC = 8)

86.20 0.7519
48.60 0.6320

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 423.15

P / bar x_1
71.50 0.0280
158.00 0.0702
236.00 0.1123
311.00 0.1518
403.00 0.1992
457.00 0.2370
510.00 0.2800
559.00 0.3246
607.20 0.3886
632.00 0.4238
661.00 0.4875
664.00 0.5398

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 448.15

P / bar y_1
442.00 0.4600 CRIT
440.00 0.5025
434.80 0.5541
402.30 0.6264
352.00 0.6805
302.10 0.7020
245.00 0.7150
185.20 0.7093
132.20 0.6750
93.10 0.6176
59.70 0.4924

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 448.15

P / bar x_1

113.00 0.0518
184.70 0.0987
271.00 0.1571
362.40 0.2451
421.00 0.3368
433.30 0.3768
434.40 0.3861
439.10 0.4240

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 473.15

P / bar y_1
276.00 0.3400 CRIT
243.00 0.4906
167.20 0.5143
121.00 0.4718
78.30 0.3408

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 473.15

P / bar x_1
160.00 0.0919
219.00 0.1604
263.00 0.2469
275.00 0.2684

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 498.75

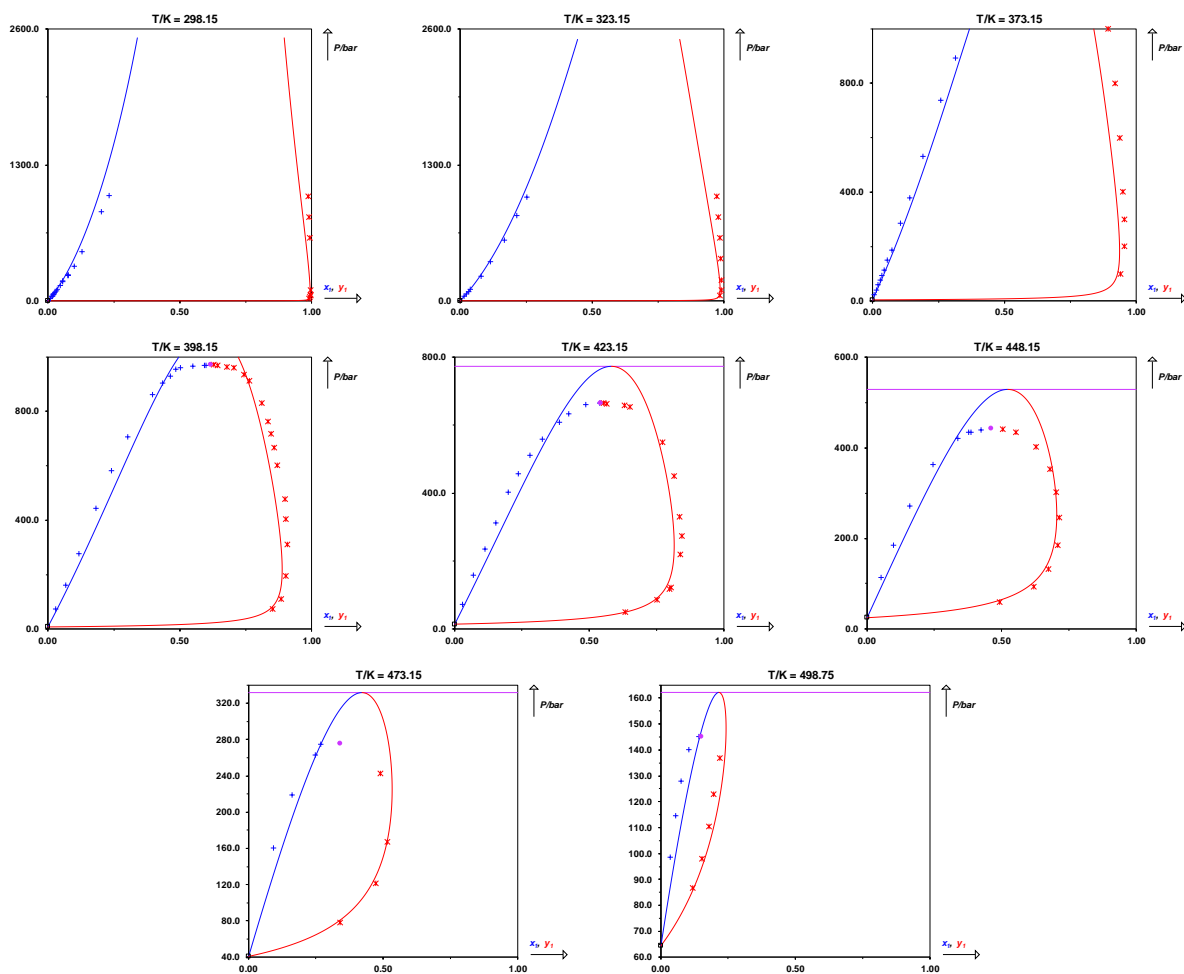
P / bar y_1
86.60 0.1167
98.00 0.1523
110.50 0.1784
123.00 0.1970
136.70 0.2201
145.20 0.1500 CRIT

Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K = 498.75

P / bar	x_1
98.50	0.0355
114.50	0.0542
128.00	0.0750
140.00	0.1023
145.20	0.1415

SA-HA systems (BAC = 8)



CARBON DIOXIDE (1) + METHANOL (2)

CAS	124-38-9	67-56-1
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	OKKJLVBELUTLKV-UHFFFAOYSA-N
T_c / K	304.21	512.50
P_c / bar	73.83	80.84
ω	0.224	0.566

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 142.2$$

$$B/\text{MPa} = 32.81$$

Deviations

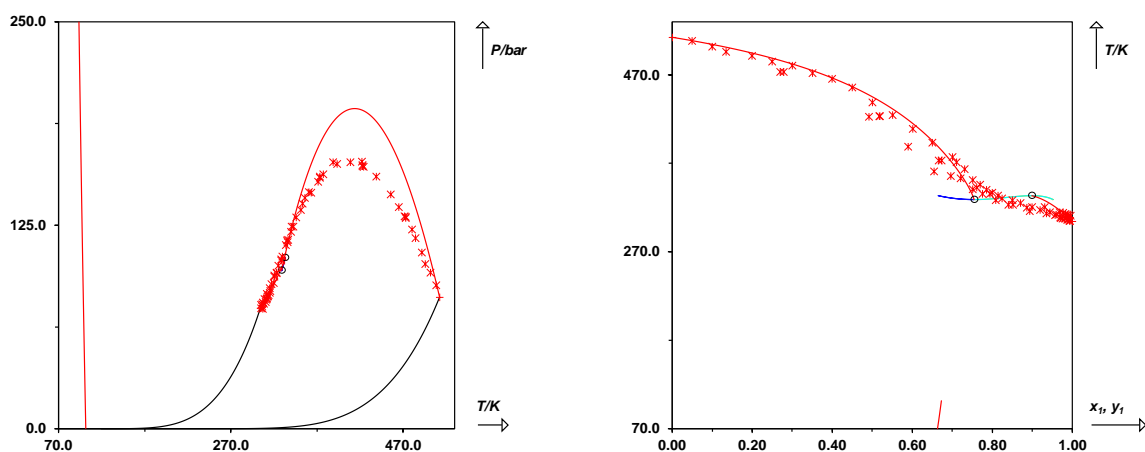
$$\text{MAPE on } x = 9.7\%$$

$$\text{MAPE on } y = 7.9\%$$

$$\text{MAPE on } x_c = 20\%$$

$$\text{MAPE on } P_c = 7.8\%$$

$$\text{MAPE on } h^M = 31\%$$



-----			P / bar	x ₁	y ₁
Isothermal phase equilibrium data			7.895	0.0596	0.9761
-----			19.06	0.1548	0.9907
Naidoo, Paramespri - Ramjugernath, Deresh - Raal, Johan David, A new high-pressure vapour-liquid equilibrium apparatus, Fluid Phase Equilibria. 269 (2008) 104-112. doi:10.1016/j.fluid.2008.05.002			30.65	0.2601	0.9920
T / K = 273.15			40.03	0.3495	0.9929
P / bar	x ₁	y ₁	49.31	0.4886	0.9930
8.910	0.1106	0.9908	55.74	0.6451	0.9931
17.92	0.2315	0.9943	Katayama, Takashi - Ohgaki, Kazunari - Maekawa, Goro - Goto, Motojiro - Nagano, Tamon, Isothermal Vapor-Liquid Equilibria Of Acetone-Carbon Dioxide And Methanol-Carbon Dioxide Systems At High Pressures, Journal of Chemical Engineering of Japan. 8 (1975) 89-92. doi:10.1252/jcej.8.89		
26.81	0.4155	0.9968	T / K = 298.15		
32.73	0.6753	0.9975	P / bar	x ₁	y ₁
Hong, Jane H. - Kobayashi, Riki, Vapor-liquid equilibrium studies for the carbon dioxide-methanol system, Fluid Phase Equilibria. 41 (1988) 269-276. doi:10.1016/0378-3812(88)80011-6			2.186	0.0150	0.9202
T / K = 273.15			5.652	0.0410	0.9685
P / bar	x ₁	y ₁	9.511	0.0700	0.9797
6.895	0.0828	0.9942	17.31	0.1310	0.9878
13.79	0.1692	0.9969	30.01	0.2560	0.9917
17.24	0.2210	0.9975	41.34	0.3610	0.9928
20.68	0.2710	0.9979	47.59	0.4500	0.9930
27.58	0.4163	0.9984	54.59	0.6100	0.9929
30.82	0.5394	0.9985	56.51	0.6620	0.9922
33.03	0.7680	0.9985	58.54	0.8100	0.9926
33.23	0.8160	0.9986	59.83	0.9225	0.9930
Hong, Jane H. - Kobayashi, Riki, Vapor-liquid equilibrium studies for the carbon dioxide-methanol system, Fluid Phase Equilibria. 41 (1988) 269-276. doi:10.1016/0378-3812(88)80011-6			60.25	0.9325	0.9926
T / K = 290.00			61.28	0.9573	0.9937
P / bar	x ₁	y ₁	Chang, Chiehming J. - Day, Chany-Yih - Ko, Ching-Ming - Chiu, Kou-Lung, Densities and P-x-y diagrams for carbon dioxide dissolution in methanol, ethanol, and acetone mixtures, Fluid Phase Equilibria. 131 (1997) 243-258. doi:10.1016/S0378-3812(96)03208-6		
6.895	0.0550	0.9844	T / K = 303.18		
13.79	0.1159	0.9910	P / bar	x ₁	y ₁
17.24	0.1475	0.9925	8.900	0.0689	0.9766
27.58	0.2475	0.9948	13.10	0.0924	0.9807
41.37	0.4310	0.9959	16.50	0.1204	0.9825
48.26	0.6671	0.9959	20.10	0.1509	0.9848
50.06	0.8454	0.9960	24.30	0.1814	0.9859
50.33	0.8964	0.9961	29.10	0.2154	0.9866
51.64	0.9694	0.9971	34.20	0.2571	0.9877
Ohgaki, Kazunari - Katayama, Takashi, Isothermal vapor-liquid equilibrium data for binary systems containing carbon dioxide at high pressures: methanol-carbon dioxide, n-hexane-carbon dioxide, and benzene-carbon dioxide systems, Journal of Chemical & Engineering Data. 21 (1976) 53-55. doi:10.1021/je60068a015			38.90	0.2972	0.9985
T / K = 298.15			42.50	0.3245	0.9906
			45.60	0.3507	0.9912
			49.40	0.4005	0.9918
			53.10	0.4777	0.9901
			55.80	0.5455	0.9885
			59.30	0.6219	0.9867

SA-HA systems (BAC = 8)

			P / bar	x ₁	y ₁
61.70	0.7083	0.9834	27.30	0.1479	0.9781
63.20	0.8833	0.9740	37.80	0.2199	0.9832
Hong, Jane H. - Kobayashi, Riki, Vapor—liquid equilibrium studies for the carbon dioxide—methanol system, Fluid Phase Equilibria. 41 (1988) 269-276. doi:10.1016/0378-3812(88)80011-6			56.00	0.3546	0.9857
T / K = 310.00			65.70	0.4555	0.9846
P / bar	x ₁	y ₁	78.40	0.7651	0.9757
6.895	0.0373	0.9516	79.30	0.8218	0.9743
10.34	0.0573	0.9665	79.90	0.8968	0.9745
13.79	0.0779	0.9751	80.60	0.9147	0.9688
20.68	0.1214	0.9826	81.00	0.9298	0.9635
27.58	0.1648	0.9863	81.20	0.9350	0.9452
41.37	0.2628	0.9891	81.50	0.9351	0.9351 CRIT
55.16	0.3831	0.9894			
68.95	0.5954	0.9874			
71.15	0.6458	0.9862			
72.40	0.7248	0.9856			
73.77	0.8493	0.9847			
74.33	0.8931	0.9846			
74.39	0.9184	0.9844			
74.46	0.9065	0.9846			
74.81	0.9348	0.9835			
76.67	0.9703	0.9833			
77.22	0.9736	0.9823			
77.29	0.9745	0.9820			
77.43	0.9750	0.9814			

Laursen, T. - Rasmussen, P. - Andersen, S.I., VLE and VLE Measurements of Dimethyl Ether Containing Systems, J. Chem. Eng. Data. 47 (2002) 198-202. doi:10.1021/je010154+

T / K = 313.15		
P / bar	x ₁	y ₁
15.90	0.0887	0.9799
28.80	0.1693	0.9871
41.40	0.2486	0.9889
53.80	0.3448	0.9894
63.40	0.4251	0.9883

Ohgaki, Kazunari - Katayama, Takashi, Isothermal vapor-liquid equilibrium data for binary systems containing carbon dioxide at high pressures: methanol-carbon dioxide, n-hexane-carbon dioxide, and benzene-carbon dioxide systems, Journal of Chemical & Engineering Data. 21 (1976) 53-55. doi:10.1021/je60068a015

T / K = 313.15		
P / bar	x ₁	y ₁
5.773	0.0285	0.9363
17.70	0.1023	0.9774
30.05	0.1641	0.9847
40.87	0.2339	0.9868
57.06	0.3655	0.9882
62.72	0.4201	0.9880
70.93	0.5429	0.9866
77.03	0.6892	0.9840
80.58	0.8970	0.9748

Naidoo, Paramespri - Ramjugernath, Deresh - Raal, Johan David, A new high-pressure vapour—liquid equilibrium apparatus, Fluid Phase Equilibria. 269 (2008) 104-112. doi:10.1016/j.fluid.2008.05.002

T / K = 313.15		
P / bar	x ₁	y ₁
12.91	0.0653	0.9732
23.13	0.1233	0.9825
31.45	0.1856	0.9856
43.39	0.2516	0.9826
51.92	0.3227	0.9845
55.46	0.3470	0.9860
61.31	0.3968	0.9849
67.58	0.4736	0.9866

Kodama, Daisuke - Kubota, Nobuo - Yamaki, Yoshikazu - Tanaka, Hiroyuki - Kato, Masahiro, High Pressure Vapor-Liquid Equilibria and Density Behaviors for Carbon Dioxide+Methanol System at 313.15 K., Netsu Bussei. 10 (1996) 16-20. doi:10.2963/jjtp.10.16

T / K = 313.15		
P / bar	x ₁	y ₁
20.11	0.1060	0.9750
50.35	0.2980	0.9780

Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO₂-alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1

T / K = 313.15

SA-HA systems (BAC = 8)

59.69	0.3750	0.9770		T / K =	330.00		
65.07	0.4260	0.9800		P / bar	x ₁	y ₁	
70.22	0.4920	0.9890		6.895	0.0245	0.8791	
75.06	0.5850	0.9810		13.79	0.0558	0.9403	
				20.68	0.0874	0.9572	
				27.58	0.1183	0.9668	
				41.37	0.1850	0.9746	
				55.16	0.2597	0.9772	
				68.95	0.3448	0.9773	
				82.74	0.4415	0.9735	
				96.53	0.5830	0.9621	
				103.42	0.7127	0.9347	
				104.80	0.7475	0.9203	
				106.18	0.8195	0.8903	
				106.46	0.8460	0.8759	
Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO ₂ -alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1							
T / K =	320.15						
P / bar	x ₁	y ₁					
6.000	0.0326	0.9150					
26.90	0.1371	0.9717					
37.00	0.1913	0.9778					
57.20	0.3166	0.9815					
65.00	0.3750	0.9804					
81.40	0.5505	0.9738					
86.20	0.6757	0.9662					
88.50	0.8053	0.9484					
88.80	0.8287	0.9441					
89.30	0.8791	0.9010					
89.50	0.8860	0.8860	CRIT				
Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO ₂ -alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1							
T / K =	330.00						
P / bar	x ₁	y ₁					
7.800	0.0346	0.8857					
22.40	0.0960	0.9537					
31.20	0.1342	0.9610					
51.70	0.2365	0.9717					
60.70	0.2845	0.9725					
89.00	0.4836	0.9647					
94.20	0.5382	0.9584					
102.20	0.6779	0.9438					
104.80	0.7401	0.8777					
105.50	0.7694	0.8619					
105.70	0.8215	0.8572					
105.90	0.8243	0.8243	CRIT				
Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO ₂ -alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1							
T / K =	335.65						
P / bar	x ₁	y ₁					
8.400	0.0336	0.8592					
30.80	0.1208	0.9502					
44.10	0.1768	0.9620					
65.20	0.2760	0.9671					
74.40	0.3247	0.9664					
93.20	0.4471	0.9583					
102.80	0.5330	0.9466					
111.50	0.6651	0.8948					
112.50	0.6762	0.8901					
114.40	0.7759	0.8250					
114.50	0.7925	0.8059					
114.60	0.7940	0.7940	CRIT				
Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO ₂ -alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1							
T / K =	342.80						
P / bar	x ₁	y ₁					
6.700	0.0247	0.7999					
31.30	0.1145	0.9403					
42.00	0.1553	0.9510					
52.30	0.1961	0.9559					
73.70	0.2909	0.9586					
Hong, Jane H. - Kobayashi, Riki, Vapor—liquid equilibrium studies for the carbon dioxide—methanol system, Fluid Phase Equilibria. 41 (1988) 269-276. doi:10.1016/0378-3812(88)80011-6							

SA-HA systems (BAC = 8)

84.00	0.3427	0.9574	38.73	0.0887	0.8837
104.10	0.4664	0.9432	50.94	0.1258	0.9053
111.00	0.5234	0.9312	68.22	0.1783	0.9138
116.40	0.5806	0.9108	75.28	0.2033	0.9127
122.30	0.6792	0.8498	90.67	0.2531	0.9118
122.10	0.6719	0.8526	105.94	0.3103	0.9100
123.70	0.7311	0.8026	120.68	0.3611	0.8927
123.90	0.7603	0.7720			
124.00	0.7610	0.7610			

Semenova, A.I. - Emel'yanova, E.A. - Tsimmerman, S.S. - Tsiklis, D.S., Phase equilibriums in the methanol-carbon dioxide system, Zh. Fiz. Khim. 53 (1979) 2502-2505.

T / K = 348.15

P / bar	x ₁	y ₁
5.000	0.0110	0.6180
10.00	0.0300	0.8150
15.00	0.0490	0.8780
20.00	0.0680	0.9080
25.00	0.0860	0.9240
30.00	0.1040	0.9350
45.00	0.1580	0.9460
50.00	0.1740	0.9480
60.00	0.2120	0.9530
70.00	0.2520	0.9580
80.00	0.2960	0.9520
90.00	0.3420	0.9460
100.00	0.3860	0.9400
110.00	0.4310	0.9360

Leu, Ah-Dong - Chung, Samuel Y.-K. - Robinson, Donald B., The equilibrium phase properties of (carbon dioxide + methanol), The Journal of Chemical Thermodynamics. 23 (1991) 979-985. doi:10.1016/S0021-9614(05)80178-8

T / K = 352.60

P / bar	x ₁	y ₁
8.250	0.0187	0.7554
21.51	0.0615	0.8917
45.57	0.1409	0.9332
76.68	0.2535	0.9422
113.28	0.4238	0.9224
126.73	0.5273	0.8885

Naidoo, Paramespri - Ramjugernath, Deresh - Raal, Johan David, A new high-pressure vapour-liquid equilibrium apparatus, Fluid Phase Equilibria. 269 (2008) 104-112. doi:10.1016/j.fluid.2008.05.002

T / K = 373.15

P / bar	x ₁	y ₁
21.57	0.0451	0.8042
30.89	0.0697	0.8629

Semenova, A.I. - Emel'yanova, E.A. - Tsimmerman, S.S. - Tsiklis, D.S., Phase equilibriums in the methanol-carbon dioxide system, Zh. Fiz. Khim. 53 (1979) 2502-2505.

T / K = 373.15

P / bar	x ₁	y ₁
5.000	0.0050	0.3500
10.00	0.0180	0.6300
15.00	0.0320	0.7350
20.00	0.0470	0.7890
25.00	0.0610	0.8270
30.00	0.0750	0.8550
35.00	0.0900	0.8760
40.00	0.1040	0.8910
45.00	0.1180	0.9010
50.00	0.1320	0.9070
90.00	0.2500	0.9100
100.00	0.2830	0.9080
110.00	0.3160	0.9040

Zhu Hu-Gang - Tian Yi-Ling - Chen Li - Feng Ji-Jun - Fu Hua-Feng, Studies on vapor-liquid phase equilibria for SCF CO₂+ CH₃OH and SCF CO₂+ C₂H₅OH systems, Gaodeng Xuexiao Huaxue Xuebao. 23 (2002) 1588-1591.

T / K = 373.15

P / bar	x ₁	y ₁
85.00	0.2395	0.9010
90.00	0.2487	0.9117
120.00	0.3534	0.8989
130.00	0.4018	0.8801
150.00	0.5212	0.8092
155.00	0.6654	0.6654

Leu, Ah-Dong - Chung, Samuel Y.-K. - Robinson, Donald B., The equilibrium phase properties of (carbon dioxide + methanol), The Journal of Chemical Thermodynamics. 23 (1991) 979-985. doi:10.1016/S0021-9614(05)80178-8

T / K = 394.20

P / bar	x ₁	y ₁
10.30	0.0087	0.3328
26.80	0.0446	0.6590
37.00	0.0680	0.7458
60.10	0.1243	0.8202
100.50	0.2307	0.8407

SA-HA systems (BAC = 8)

139.10	0.3693	0.7916	-111.20	0.0420
152.80	0.4469	0.7613	-202.80	0.0840
162.90	0.5493	0.6621	-398.20	0.1700

Semenova, A.I. - Emel'yanova, E.A. - Tsimmerman, S.S. - Tsiklis, D.S., Phase equilibriums in the methanol-carbon dioxide system, Zh. Fiz. Khim. 53 (1979) 2502-2505.

T / K = 398.15

P / bar	x ₁	y ₁
10.00	0.0070	0.2680
15.00	0.0190	0.4500
20.00	0.0320	0.6000
25.00	0.0440	0.6600
30.00	0.0560	0.7100
35.00	0.0680	0.7340
40.00	0.0800	0.7620
45.00	0.0940	0.7840
50.00	0.1050	0.8020
60.00	0.1290	0.8240
70.00	0.1540	0.8380
80.00	0.1800	0.8450
90.00	0.2040	0.8480
120.00	0.2920	0.8480
130.00	0.3150	0.8400

-555.60	0.2600
-654.20	0.3530
-640.60	0.5510
-542.40	0.6560
-397.90	0.7650
-172.50	0.8790
-39.00	0.9380

Hauser, Raul A. - Zhao, Jian Ping - Tremaine, Peter R. - Mather, Alan E., Excess molar enthalpies of six (carbon dioxide + a polar solvent) mixtures at the temperatures 298.15 K and 308.15 K and pressures from 7.5 MPa to 12.6 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 1303-1317. doi:10.1006/jcht.1996.0115

T / K = 298.15

P / bar = 126.00

h ^M / J.mol ⁻¹	z ₁
-70.30	0.0430
-145.50	0.0860
-306.70	0.1750
-456.60	0.2660
-511.60	0.3600
-465.50	0.4580
-331.30	0.5580
-206.50	0.6630
-54.80	0.7700
113.00	0.8820
151.00	0.9400

Leu, Ah-Dong - Chung, Samuel Y.-K. - Robinson, Donald B., The equilibrium phase properties of (carbon dioxide + methanol), The Journal of Chemical Thermodynamics. 23 (1991) 979-985. doi:10.1016/S0021-9614(05)80178-8

T / K = 477.60

P / bar	x ₁	y ₁
52.90	0.0173	0.1283
54.40	0.0179	0.1452
63.30	0.0384	0.1854
83.60	0.0769	0.3001
109.40	0.1422	0.3378
121.00	0.1842	0.3112
125.10	0.2131	0.2928

Dai, W. - Kojima, K. - Ochi, K., Measurement and Correlation of Excess Molar Enthalpies of CO₂ + CH₃OH System in the Vicinity of Critical Point of Carbon Dioxide, J. Chem. Eng. Data. 44 (1999) 161-164. doi:10.1021/je980191+

T / K = 303.15

P / bar = 80.00

h ^M / J.mol ⁻¹	z ₁
-36.00	0.0190
-165.00	0.0382
-288.00	0.0774
-424.00	0.1176
-540.00	0.1588
-622.00	0.2011
-702.00	0.2445
-768.00	0.2891
-829.00	0.3349
-857.00	0.3819
-868.00	0.4303

Enthalpy of mixing

Hauser, Raul A. - Zhao, Jian Ping - Tremaine, Peter R. - Mather, Alan E., Excess molar enthalpies of six (carbon dioxide + a polar solvent) mixtures at the temperatures 298.15 K and 308.15 K and pressures from 7.5 MPa to 12.6 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 1303-1317. doi:10.1006/jcht.1996.0115

T / K = 298.15

P / bar = 75.00

h^M / J.mol⁻¹ z₁

SA-HA systems (BAC = 8)

-866.00	0.4800	-1996.2	0.2838
-863.00	0.5311	-2324.4	0.3292
-831.00	0.5838	-2592.2	0.3759
-785.00	0.6380	-2893.2	0.4240
-701.00	0.6938	-3129.4	0.4736
-610.00	0.7513	-3428.2	0.5247
-449.00	0.8106	-3648.1	0.5775
-270.00	0.8717	-3918.9	0.6320
-142.00	0.9349	-4200.8	0.6883

Dai, W. - Kojima, K. - Ochi, K., Measurement and Correlation of Excess Molar Enthalpies of CO₂ + CH₃OH System in the Vicinity of Critical Point of Carbon Dioxide, J. Chem. Eng. Data. 44 (1999) 161-164. doi:10.1021/je980191+

T / K = 303.15

P / bar = 70.00

$h^M / J.mol^{-1}$ z_1

-262.00	0.0374
-627.00	0.0758
-895.00	0.1153
-1151.0	0.1559
-1430.0	0.1975
-1705.0	0.2404
-1963.0	0.2845
-2245.0	0.3299
-2540.0	0.3767
-2773.0	0.4248
-2990.0	0.4744
-3157.0	0.5256
-3315.0	0.5783
-3489.0	0.6328
-3524.0	0.6890
-3500.0	0.7471
-1313.0	0.8194
190.00	0.8692
94.00	0.9335

Dai, Wenbin - Ochi, Kenji - Kurihara, Kiyofumi - Kojima, Kazuo - Hongo, Masaru, Measurement and Correlation of Excess Enthalpy for the System(CO₂+CH₃OH) Containing Supercritical Carbon Dioxide., Netsu Bussei. 12 (1998) 64-69. doi:10.2963/jjtp.12.64

T / K = 308.15

P / bar = 75.00

$h^M / J.mol^{-1}$ z_1

-578.19	0.0756
-872.37	0.1150
-1236.6	0.1554
-1452.8	0.1970
-1708.6	0.2398

-4429.6	0.8066
-4280.1	0.8688
-3319.9	0.9333
-2895.5	0.9464
-2276.8	0.9597
-1524.8	0.9730

Dai, Wenbin - Ochi, Kenji - Kurihara, Kiyofumi - Kojima, Kazuo - Hongo, Masaru, Measurement and Correlation of Excess Enthalpy for the System(CO₂+CH₃OH) Containing Supercritical Carbon Dioxide., Netsu Bussei. 12 (1998) 64-69. doi:10.2963/jjtp.12.64

T / K = 308.15

P / bar = 77.00

$h^M / J.mol^{-1}$ z_1

-199.62	0.1554
-277.63	0.1970
-533.39	0.2398
-803.45	0.2838
-1083.1	0.3292
-1384.0	0.3759
-1656.1	0.4240
-2038.1	0.4736
-2266.5	0.5247
-2489.2	0.5775
-2656.8	0.6320
-2887.3	0.6883
-3010.3	0.7465
-2855.0	0.8066
-2367.7	0.8688
-1488.6	0.9333
-839.63	0.9663

Dai, Wenbin - Ochi, Kenji - Kurihara, Kiyofumi - Kojima, Kazuo - Hongo, Masaru, Measurement and Correlation of Excess Enthalpy for the System(CO₂+CH₃OH) Containing Supercritical Carbon Dioxide., Netsu Bussei. 12 (1998) 64-69. doi:10.2963/jjtp.12.64

T / K = 308.15

P / bar = 79.00

$h^M / J.mol^{-1}$ z_1

SA-HA systems (BAC = 8)

-242.23	0.3292	3360.0	0.8617
-349.88	0.3759		
-545.77	0.4240		
-867.68	0.4736		
-1307.7	0.5247		
-1644.8	0.5775		
-1778.8	0.6320		
-1867.2	0.6883		
-1679.4	0.7465		
-1366.2	0.8066		
-697.48	0.8688		
-388.15	0.9008		
-136.38	0.9333		
Christensen, J.J - Cordray, D.R - Oscarson, J.L - Izatt, R.M, The excess enthalpies of four (carbon dioxide + an alkanol) mixtures from 308.15 to 573.15 K at 7.50 to 12.50 MPa, The Journal of Chemical Thermodynamics. 20 (1988) 867-875. doi:10.1016/0021-9614(88)90076-6			
T / K =	473.15		
P / bar =	75.00		
$h^M / J.mol^{-1}$	z_1		
127.00	0.0139	224.00	0.0155
376.00	0.0423	716.00	0.0469
616.00	0.0568	1110.0	0.0789
1180.0	0.0714	1280.0	0.1115
1440.0	0.0863	1290.0	0.1115
2090.0	0.1013	1480.0	0.1281
3360.0	0.1319	1560.0	0.1448
5920.0	0.1794	1860.0	0.1958
6320.0	0.1956	1910.0	0.2132
7130.0	0.2121	2080.0	0.2484
8240.0	0.2288	2160.0	0.2843
9610.0	0.2629	2240.0	0.3209
10000.0	0.2802	2300.0	0.3583
11200.0	0.3158	2290.0	0.3964
11200.0	0.3339	2260.0	0.4354
11700.0	0.3523	2220.0	0.4751
11800.0	0.3709	2200.0	0.5157
11700.0	0.3899	2010.0	0.5571
11900.0	0.4091	1930.0	0.5782
11300.0	0.4285	1800.0	0.5995
10900.0	0.4483	1780.0	0.6210
10100.0	0.5304	1800.0	0.6427
9480.0	0.5733	1640.0	0.6647
8690.0	0.6176	1600.0	0.6870
7400.0	0.6633	1440.0	0.7094
6570.0	0.7105	1310.0	0.7322
5650.0	0.7592	1170.0	0.7784
4650.0	0.8096	910.00	0.8257
		673.00	0.8740
		380.00	0.9235
		146.00	0.9742

Critical point			

Gurdial, Gurdev S. - Foster, Neil R. - Yun, S. L. Jimmy - Tilly, Kevin D., Phase Behavior of Supercritical Fluid—Entrainer Systems, Supercritical Fluid Engineering Science. 514 (1992) 34-45.			
T / K	P / bar	x_1	
305.00	76.20	0.9924	

SA-HA systems (BAC = 8)

306.20	76.60	0.9874	308.12	76.63	0.9710
307.20	77.40	0.9811	315.67	84.49	0.8940
309.10	79.70	0.9693	328.21	103.92	0.8090
311.70	82.70	0.9562	335.19	115.56	0.7750
314.90	86.50	0.9432	340.65	124.04	0.7510
320.50	93.50	0.9307	353.15	138.37	0.7210

Gil, Laura - Blanco, Sofía T. - Rivas, Clara - Laga, Eduardo - Fernández, Javier - Artal, Manuela - Velasco, Inmaculada, Experimental determination of the critical loci for {n-C6H14 or CO2+alkan-1-ol} mixtures. Evaluation of their critical and subcritical behavior using PC-SAFT EoS, The Journal of Supercritical Fluids. 71 (2012) 26-44. doi:10.1016/j.supflu.2012.07.008

T / K	P / bar	x ₁
305.06	74.02	0.9949
306.25	75.03	0.9901
311.86	80.09	0.9601
317.10	88.78	0.9198
320.75	94.19	0.8989
324.92	100.16	0.8701
328.42	103.45	0.8503
333.74	112.86	0.8144
336.81	116.14	0.7998
339.82	121.12	0.7853
346.18	129.64	0.7695
350.96	134.39	0.7502
363.32	144.87	0.7301
371.44	151.69	0.7101
377.29	156.23	0.7000
393.20	162.66	0.6505
408.98	163.88	0.6006
424.25	160.96	0.5503
438.84	154.80	0.4999
455.58	143.89	0.4494
465.25	136.14	0.4001
471.87	130.58	0.3505
480.24	122.49	0.3000
484.72	117.12	0.2501
491.70	108.30	0.1997
495.95	101.33	0.1351
501.64	95.82	0.0995
508.63	88.07	0.0501

Yeo, Sang-Do - Park, Su-Jin - Kim, Jin-Woo - Kim, Jae-Chang, Critical Properties of Carbon Dioxide + Methanol, + Ethanol, + 1-Propanol, and + 1-Butanol, Journal of Chemical & Engineering Data. 45 (2000) 932-935. doi:10.1021/je000104p

T / K	P / bar	x ₁
307.26	73.52	0.9760

360.65	145.33	0.6540
388.65	163.66	0.5890
422.32	164.15	0.4920

Zhang, J.C. - Wu, X.Y. - Cao, W.L., Phase Equilibrium Properties of Supercritical Carbon Dioxide in Binary System, Gaodeng Xuexiao Huaxue Xuebao. 23 (2002) 10-13.

T / K	P / bar	x ₁
310.45	78.00	0.9951
311.35	79.10	0.9916
312.05	80.00	0.9869
312.75	81.10	0.9826
313.75	82.10	0.9764
314.85	83.40	0.9689

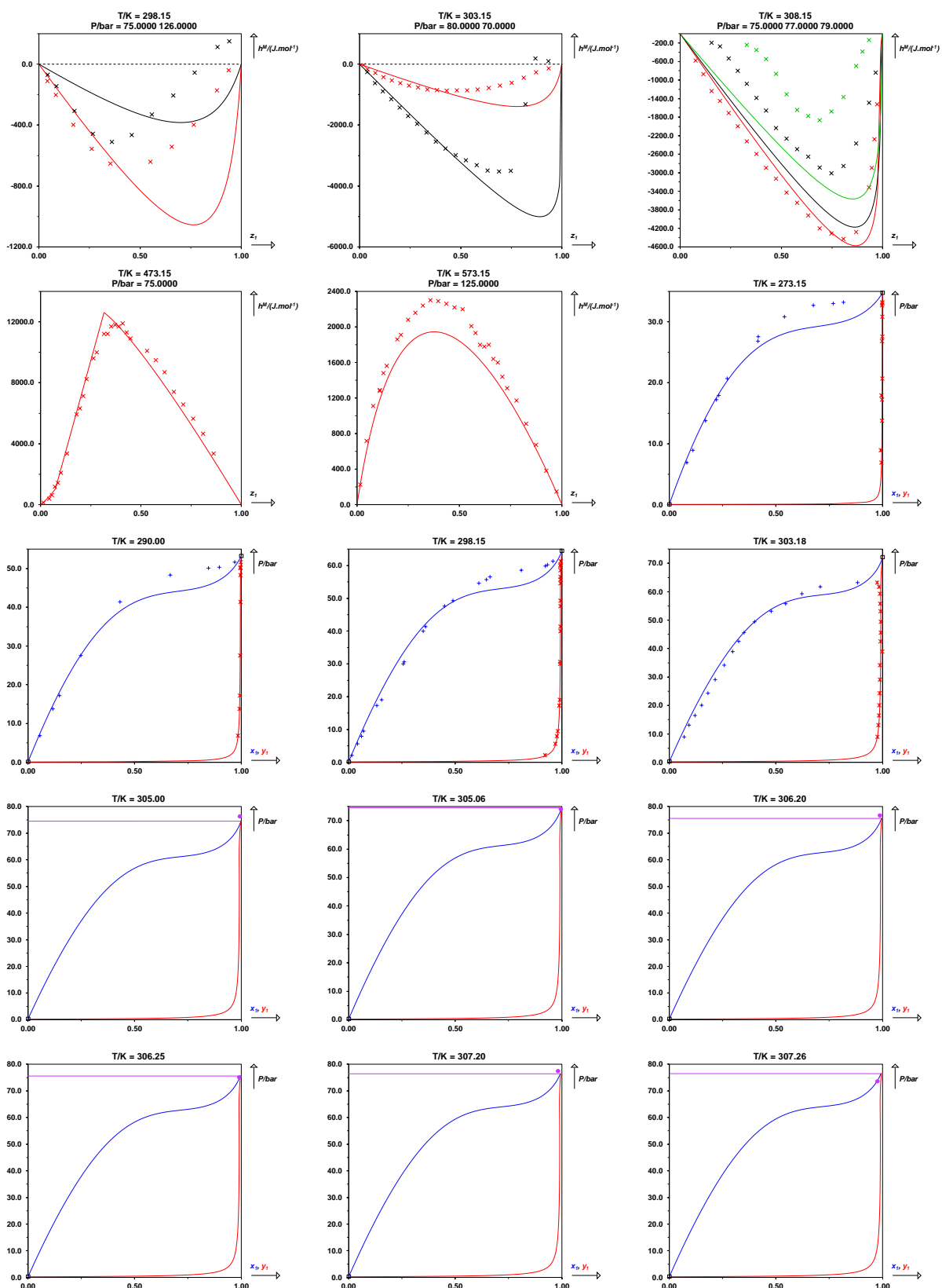
Zhu Hu-Gang - Tian Yi-Ling - Chen Li - Feng Ji-Jun - Fu Hua-Feng, Studies on vapor-liquid phase equilibria for SCF CO2+ CH3OH and SCF CO2+ C2H5OH systems, Gaodeng Xuexiao Huaxue Xuebao. 23 (2002) 1588-1591.

T / K	P / bar	x ₁
323.15	96.00	0.8510
423.15	162.00	0.5184
473.15	130.00	0.2779

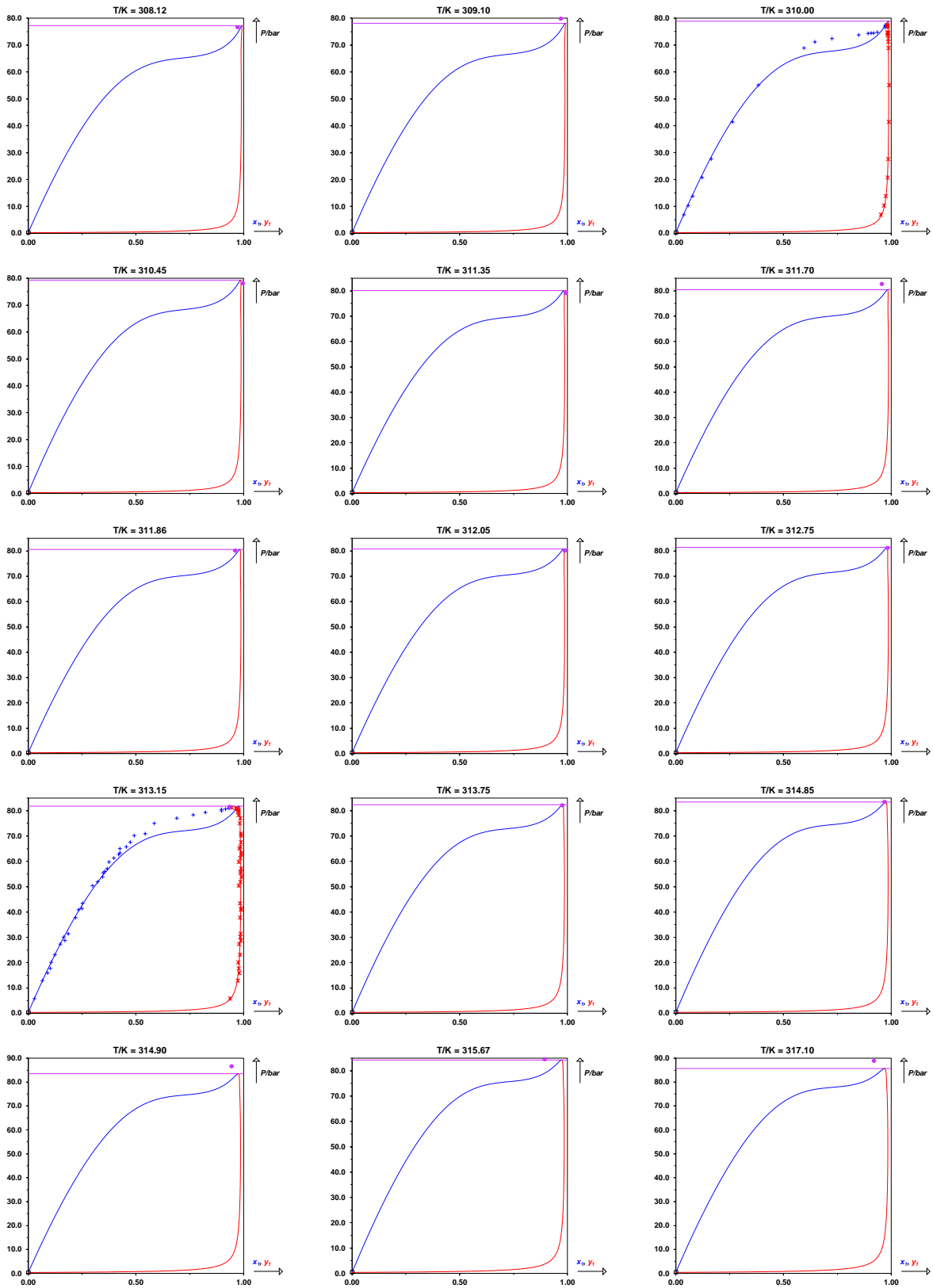
Brunner, E - Hültenschmidt, W - Schlichthärle, G, Fluid mixtures at high pressures IV. Isothermal phase equilibria in binary mixtures consisting of (methanol + hydrogen or nitrogen or methane or carbon monoxide or carbon dioxide), The Journal of Chemical Thermodynamics. 19 (1987) 273-291. doi:10.1016/0021-9614(87)90135-2

T / K	P / bar	x ₁
323.15	95.50	0.8404
373.15	154.20	0.6735
423.15	161.30	0.5178
473.15	129.30	0.2700

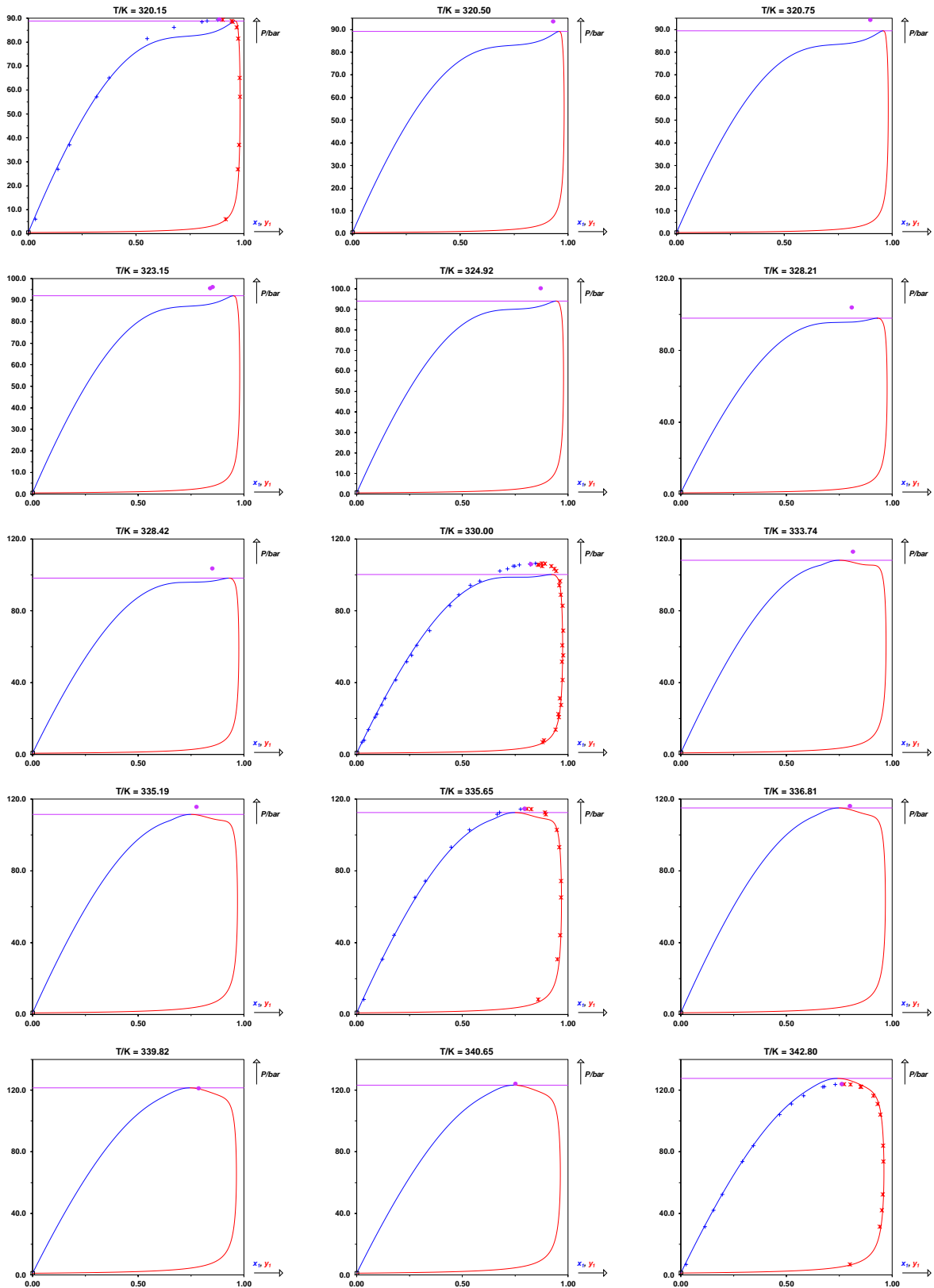
SA-HA systems (BAC = 8)



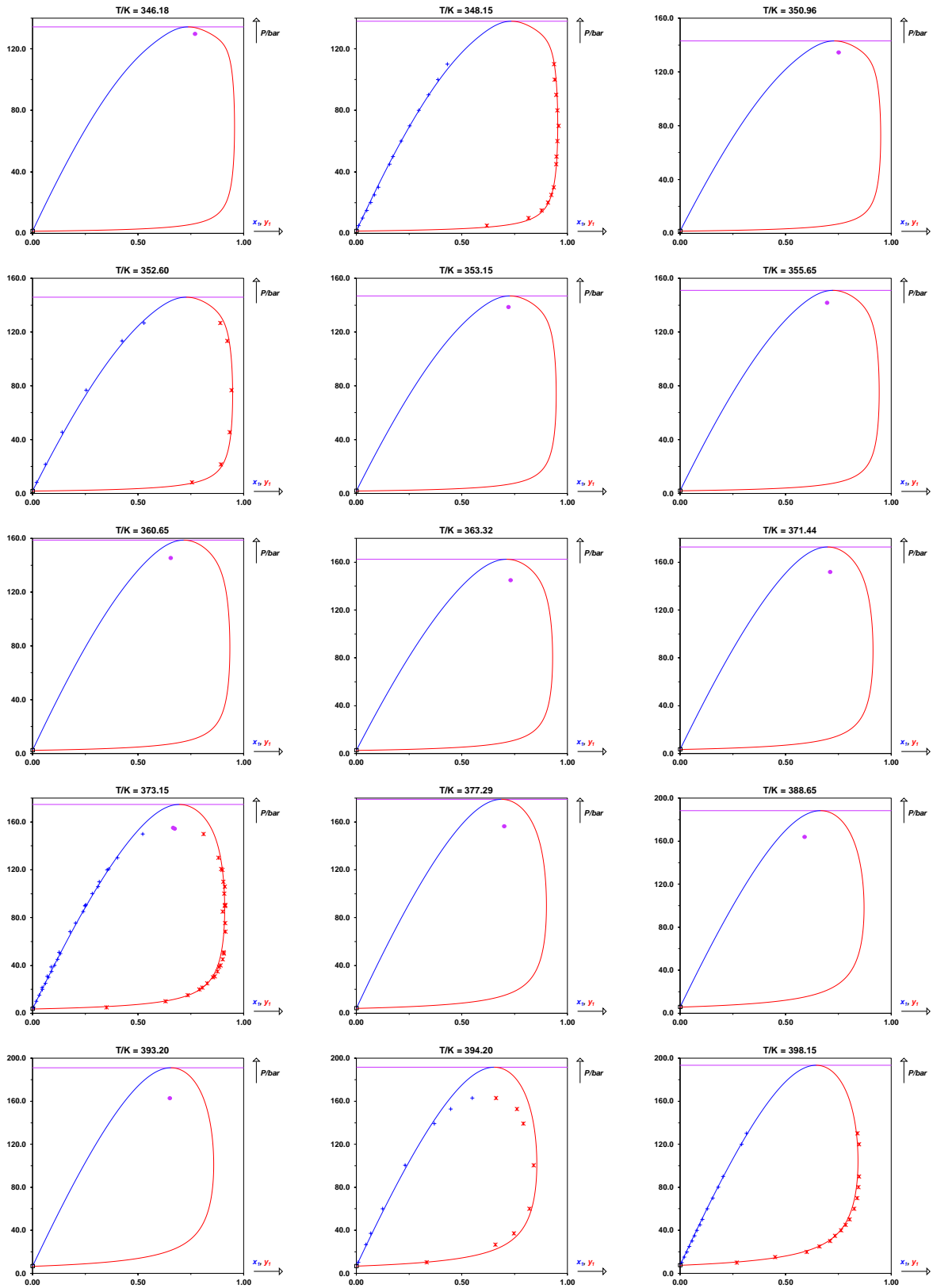
SA-HA systems (BAC = 8)



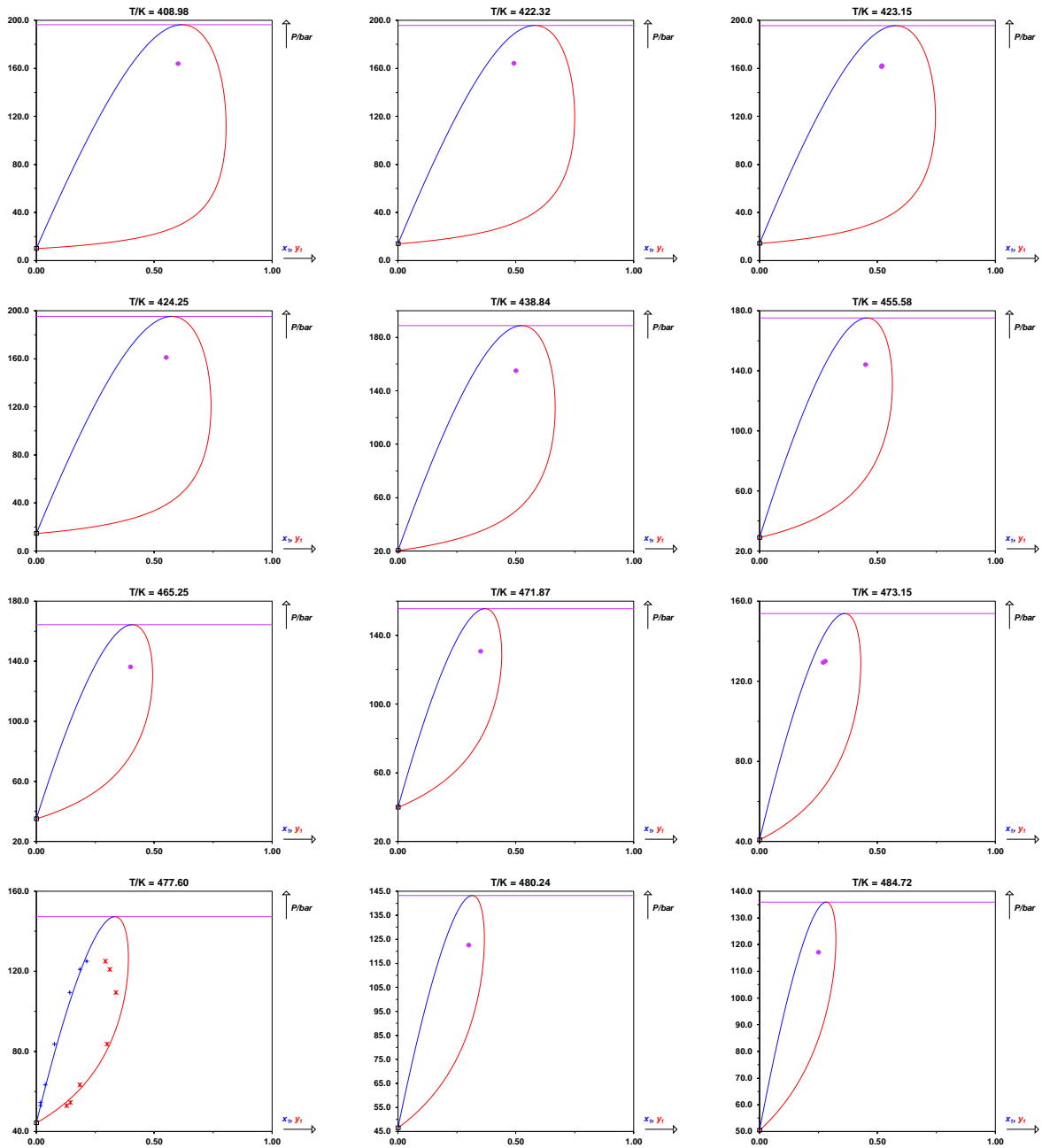
SA-HA systems (BAC = 8)



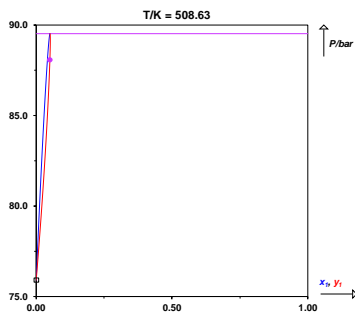
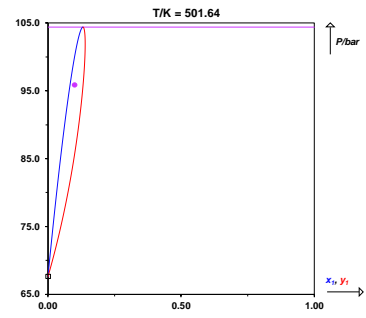
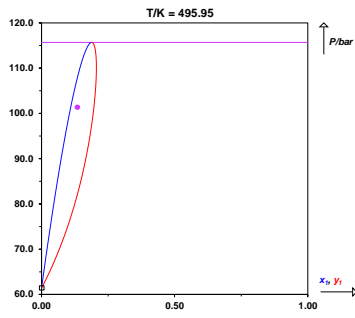
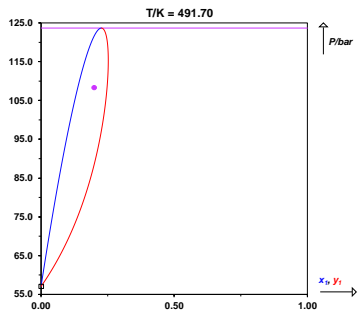
SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



METHANOL (1) + ACETONE (2)

CAS	67-56-1	67-64-1
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	CSCPPACGZOO CGX-UHFFFAOYSA-N
T_c / K	512.50	508.20
P_c / bar	80.84	47.01
ω	0.566	0.307

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 77.63$$

$$B/\text{MPa} = 72.64$$

Deviations

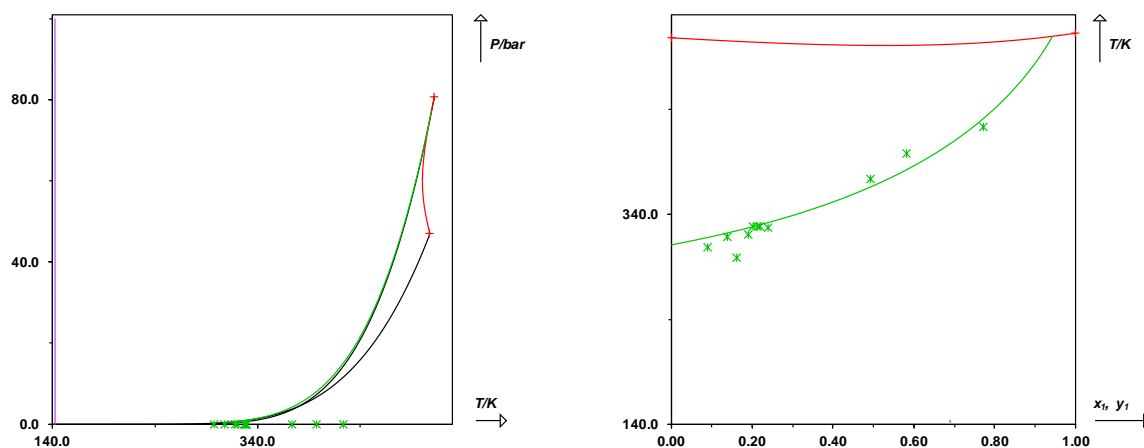
$$\text{MAPE on } x = 28 \%$$

$$\text{MAPE on } y = 22 \%$$

$$\text{MAPE on } x_{\text{az}} = 11 \%$$

$$\text{MAPE on } P_{\text{az}} = 2.8 \%$$

$$\text{MAPE on } h^{\text{M}} = 16 \%$$



-----			0.6054	0.7070	0.5550	
Isothermal phase equilibrium data			0.6366	0.5990	0.4720	
-----			0.6563	0.4990	0.4030	
Tamir, Abraham - Apelblat, Alexander - Wagner, Moshe, An evaluation of thermodynamic analyses of the vapor— liquid equilibria in the ternary system acetone— chloroform—methanol and its binaries, Fluid Phase Equilibria. 6 (1981) 113-139. doi:10.1016/0378- 3812(81)80007-6			0.6697	0.4130	0.3470	
T / K = 298.15			0.6802	0.3130	0.2790	
P / bar	x ₁	y ₁	0.6839	0.2440	0.2260	
0.1949	0.9390	0.7840	0.6870	0.1600	0.1590	
0.2042	0.9140	0.7320	0.6891	0.1370	0.1370	AZEO
0.2080	0.9060	0.7100	0.6837	0.1040	0.1100	
0.2381	0.7960	0.5650	0.6766	0.0480	0.0540	
0.2445	0.7640	0.5320	Marinichev, A.N. - Susarev, M.P., Liquid-vapor equilibriums in the systems acetone-methanol and acetone-cyclohexane at 35, 45, and 55° and a pressure of 760 mm, J. Appl. Chem. USSR. 38 (1965) 371-375.			
0.2736	0.5980	0.4020	T / K = 328.15			
0.2816	0.5400	0.3770	P / bar	x ₁	y ₁	
0.2944	0.4180	0.3050	0.7814	0.9080	0.8140	
0.2996	0.3390	0.2590	0.8563	0.8080	0.6740	
0.3080	0.2140	0.1930	0.9045	0.7100	0.5770	
0.3082	0.1880	0.1900	0.9450	0.5990	0.4890	
0.3080	0.1600	0.1600	0.9690	0.4990	0.4170	
0.3076	0.1220	0.1450	0.9862	0.4160	0.3570	
Marinichev, A.N. - Susarev, M.P., Liquid-vapor equilibriums in the systems acetone-methanol and acetone-cyclohexane at 35, 45, and 55° and a pressure of 760 mm, J. Appl. Chem. USSR. 38 (1965) 371-375.			0.9987	0.3130	0.2880	
T / K = 308.15			1.003	0.2440	0.2380	
P / bar	x ₁	y ₁	1.002	0.2140	0.2140	AZEO
0.3286	0.9060	0.7710	0.9999	0.1490	0.1600	
0.3670	0.8050	0.6310	0.9947	0.1050	0.1180	
0.3956	0.7050	0.5350	0.9833	0.0460	0.0550	
0.4182	0.5990	0.4570	Griswold, J. - Wong, S.Y., Phase-equilibria in the acetone- methanol-water system from 100° into the critical region, Chemical Engineering Progress Symposium Series. 48 (1952) 18-34.			
0.4337	0.4990	0.3870	T / K = 373.15			
0.4449	0.4090	0.3300	P / bar	x ₁	y ₁	
0.4592	0.3130	0.2640	3.523	0.9530	0.9300	
0.4608	0.2440	0.2150	3.565	0.9320	0.9070	
0.4618	0.1600	0.1490	3.758	0.8540	0.8130	
0.4629	0.1050	0.1000	3.793	0.7800	0.7420	
0.4670	0.0880	0.0880	4.012	0.6030	0.5830	
0.4605	0.0460	0.0520	4.027	0.4930	0.4930	AZEO
Marinichev, A.N. - Susarev, M.P., Liquid-vapor equilibriums in the systems acetone-methanol and acetone-cyclohexane at 35, 45, and 55° and a pressure of 760 mm, J. Appl. Chem. USSR. 38 (1965) 371-375.			4.027	0.4380	0.4530	
T / K = 318.15			4.027	0.3760	0.4020	
P / bar	x ₁	y ₁	4.012	0.3590	0.3860	
0.5104	0.9070	0.7910	4.020	0.3400	0.3650	
0.5652	0.8070	0.6530	3.958	0.2530	0.2890	
			3.854	0.1300	0.1810	
			3.751	0.0480	0.0830	
			3.682	0.0230	0.0500	

Wilsak, Richard A. - Campbell, Scott W. - Thodos, George, Vapor—liquid equilibrium measurements for the methanol—acetone system at 372.8, 397.7 and 422.6 K, Fluid Phase Equilibria. 28 (1986) 13-37. doi:10.1016/0378-3812(86)85066-X

T / K = 397.70

P / bar	x ₁	y ₁	
7.515	0.9240	0.8880	
7.681	0.8340	0.7760	
7.763	0.7450	0.7260	
7.826	0.6490	0.6380	
7.826	0.5820	0.5820	AZEO
7.805	0.5680	0.5800	
7.660	0.3850	0.4150	
7.408	0.2350	0.2720	
7.150	0.1310	0.1650	
6.850	0.0390	0.0550	

Griswold, J. - Wong, S.Y., Phase-equilibria in the acetone-methanol-water system from 100° into the critical region, Chemical Engineering Progress Symposium Series. 48 (1952) 18-34.

T / K = 423.15

P / bar	x ₁	y ₁	
14.13	0.9260	0.9170	
14.13	0.9020	0.8930	
14.20	0.8680	0.8620	
14.20	0.8240	0.8190	
14.27	0.7720	0.7720	AZEO
14.20	0.6810	0.6960	
14.07	0.5880	0.6220	
13.93	0.5190	0.5590	
13.72	0.4190	0.4850	
13.38	0.2850	0.3650	
13.10	0.2220	0.3050	
12.62	0.1390	0.2240	
12.27	0.0660	0.1500	
12.00	0.0350	0.1040	
11.65	0.0090	0.0350	

Griswold, J. - Wong, S.Y., Phase-equilibria in the acetone-methanol-water system from 100° into the critical region, Chemical Engineering Progress Symposium Series. 48 (1952) 18-34.

T / K = 473.15

P / bar	x ₁	y ₁	
39.85	0.9110	0.9170	
39.65	0.8780	0.8860	
39.30	0.8340	0.8470	
38.89	0.7720	0.7950	
37.78	0.6680	0.7080	

35.85	0.4720	0.5490	
34.27	0.3080	0.4090	
31.65	0.1000	0.2250	
29.51	0.0100	0.0870	

Isobaric phase equilibrium data

Botía, Diana C. - Riveros, Diana C. - Ortiz, Pablo - Gil, Ivan D. - Sánchez, Oscar F., Vapor–Liquid Equilibrium in Extractive Distillation of the Acetone/Methanol System Using Water as Entrainer and Pressure Reduction, Industrial & Engineering Chemistry Research. 49 (2010) 6176-6183. doi:10.1021/ie901702h

P / bar = 0.7500

T / K	x ₁	y ₁	
320.90	0.0060	0.0070	
320.60	0.0920	0.0950	
320.30	0.1900	0.1900	AZEO
320.30	0.1930	0.1880	
320.20	0.3000	0.2770	
320.80	0.4190	0.3440	
321.70	0.5520	0.4270	
323.00	0.6730	0.5300	
324.50	0.7610	0.6340	
326.50	0.8720	0.7670	

Constantino, Dânia S. M. - Pereira, Carla S. M. - Pinho, Simão P. - Silva, Viviana M. T. M. - Rodrigues, Alírio E., Isobaric Vapor–Liquid Equilibrium Data for Binary System of Glycerol Ethyl Acetal and Acetonitrile at 60.0 kPa and 97.8 kPa, Journal of Chemical & Engineering Data. 58 (2013) 1717-1723. doi:10.1021/je400138m

P / bar = 0.9780

T / K	x ₁	y ₁	
335.20	0.9556	0.8991	
333.80	0.9040	0.8027	
332.90	0.8707	0.7434	
332.10	0.8321	0.6976	
331.30	0.7821	0.6436	
330.40	0.7190	0.5818	
328.80	0.5478	0.4474	
328.20	0.4677	0.3823	
327.80	0.3804	0.3307	
327.40	0.2400	0.2400	AZEO
327.40	0.2290	0.2324	
327.60	0.0814	0.0951	

Li, Wenxiu - Sun, Dezhang - Zhang, Tao - Dai, Shangwu - Pan, Fenjin - Zhang, Zhigang, Separation of acetone and methanol azeotropic system using ionic liquid as

entrainer, Fluid Phase Equilibria. 383 (2014) 182-187.
doi:10.1016/j.fluid.2014.10.011

P / bar = 1.013

T / K	x ₁	y ₁	
336.25	0.9480	0.9020	
333.44	0.8220	0.7080	
332.11	0.7480	0.6230	
330.79	0.6490	0.5280	
329.63	0.5330	0.4460	
329.34	0.4890	0.4190	
328.97	0.4310	0.3760	
328.58	0.3490	0.3080	
328.45	0.3010	0.2720	
328.40	0.2590	0.2410	
328.38	0.2210	0.2220	
328.38	0.2200	0.2200	AZEO
328.39	0.2100	0.2170	
328.40	0.2020	0.2110	
328.44	0.1760	0.1880	
328.47	0.1610	0.1750	
328.67	0.0980	0.1130	
328.89	0.0530	0.0690	

Campbell, A.N. - Kartzmark, E.M., Thermodynamic and other properties of methanol + acetone, carbon disulphide + acetone, carbon disulphide + methanol, and carbon disulphide + methanol + acetone, The Journal of Chemical Thermodynamics. 5 (1973) 163-172.
doi:10.1016/S0021-9614(73)80076-X

P / bar = 1.033

T / K	x ₁	y ₁	
335.85	0.9470	0.9010	
334.85	0.8900	0.8260	
332.85	0.7940	0.7010	
332.05	0.7380	0.6380	
330.75	0.6550	0.5500	
329.55	0.5400	0.4600	
328.85	0.3400	0.3300	
328.85	0.2000	0.2000	AZEO
329.45	0.0920	0.1350	

Enthalpy of mixing

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochemica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 283.15

P / bar = 4.000

h ^M / J.mol ⁻¹	x ₁
105.30	0.9460
189.40	0.8990
282.10	0.8430
355.00	0.7950
429.70	0.7420
485.90	0.6920
535.20	0.6410
569.70	0.5940
598.00	0.5440
616.70	0.4900
621.00	0.4400
613.70	0.3940
596.90	0.3470
567.20	0.3000
511.10	0.2430
455.90	0.2000
378.10	0.1520
262.60	0.0970
132.30	0.0450

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochemica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 298.15

P / bar = 4.000

h ^M / J.mol ⁻¹	x ₁
116.10	0.0540
210.80	0.1010
321.70	0.1570
392.50	0.2050
470.40	0.2580
533.90	0.3080
583.50	0.3590
622.20	0.4060
653.20	0.4560
672.00	0.5100
676.30	0.5600
669.30	0.6060
649.40	0.6530
615.30	0.7000
556.60	0.7570
492.70	0.8000
408.80	0.8480
289.20	0.9030
150.40	0.9550

Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochimica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A	588.00	0.2000
	476.00	0.1520
	326.20	0.0970
	162.80	0.0450

T / K = 323.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$	x_1
133.80	0.9460
242.10	0.8990
363.50	0.8430
455.00	0.7950
541.60	0.7420
612.00	0.6920
671.30	0.6410
711.10	0.5940
745.60	0.5440
766.70	0.4900
769.00	0.4400
757.60	0.3940
730.50	0.3470
689.10	0.3000
615.60	0.2430
542.30	0.2000
441.60	0.1520
304.90	0.0970
152.90	0.0450

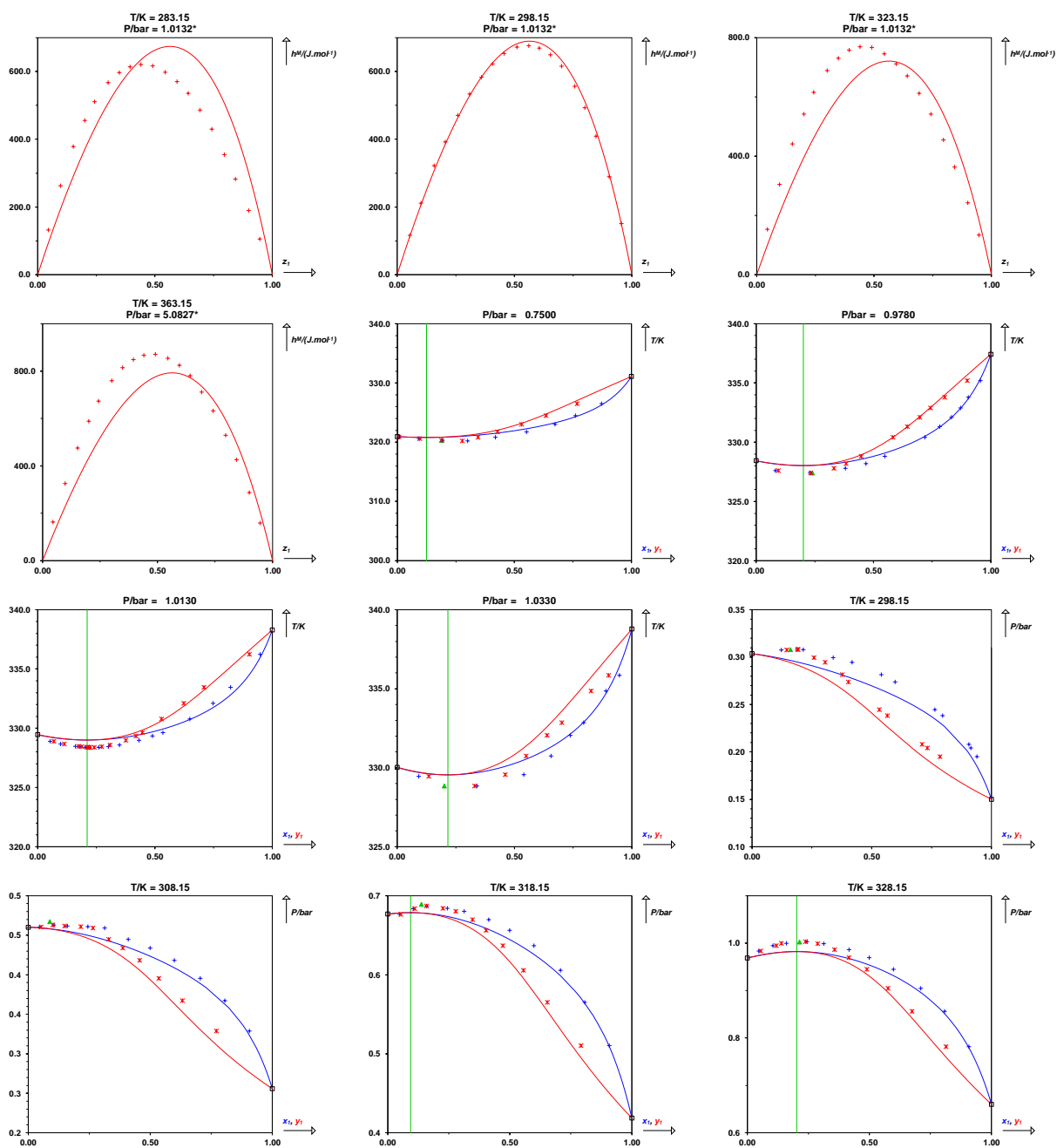
Löwen, B. - Schulz, S., Excess molar enthalpies of acetone + water, cyclohexane, methanol, 1-propanol, 2-propanol, 1-butanol and 1-pentanol at 283.15, 298.15, 323.15, 343.15 and 363.15 K, Thermochimica Acta. 262 (1995) 69-82. doi:10.1016/0040-6031(95)02278-A

T / K = 363.15

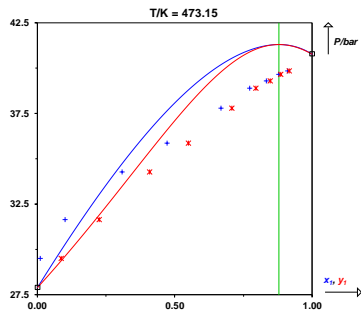
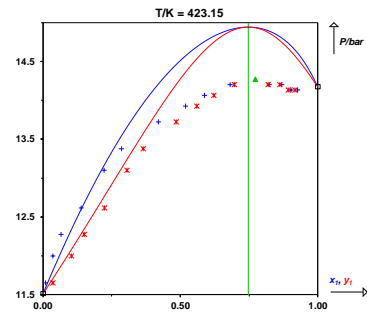
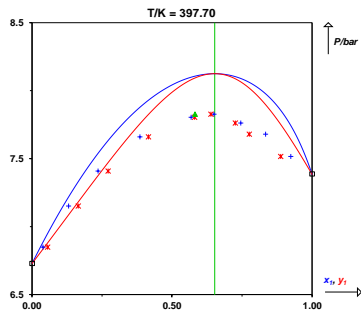
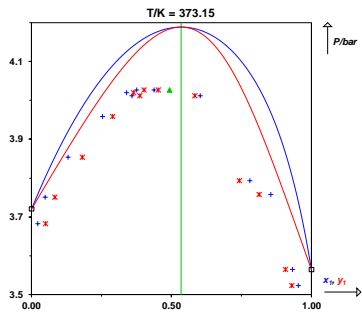
P / bar = 4.000

$h^M / \text{J.mol}^{-1}$	x_1
159.30	0.9460
286.70	0.8990
425.30	0.8430
529.60	0.7950
631.60	0.7420
711.90	0.6920
780.00	0.6410
825.10	0.5940
853.70	0.5440
871.40	0.4900
866.40	0.4400
848.90	0.3940
813.90	0.3470
759.90	0.3000
672.90	0.2430

SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



METHANOL (1) + THIOPHENE (2)

CAS	67-56-1	110-02-1
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	YTPLMLYBLZKORZ-UHFFFAOYSA-N
T_c / K	512.50	579.35
P_c / bar	80.84	56.90
ω	0.566	0.197

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

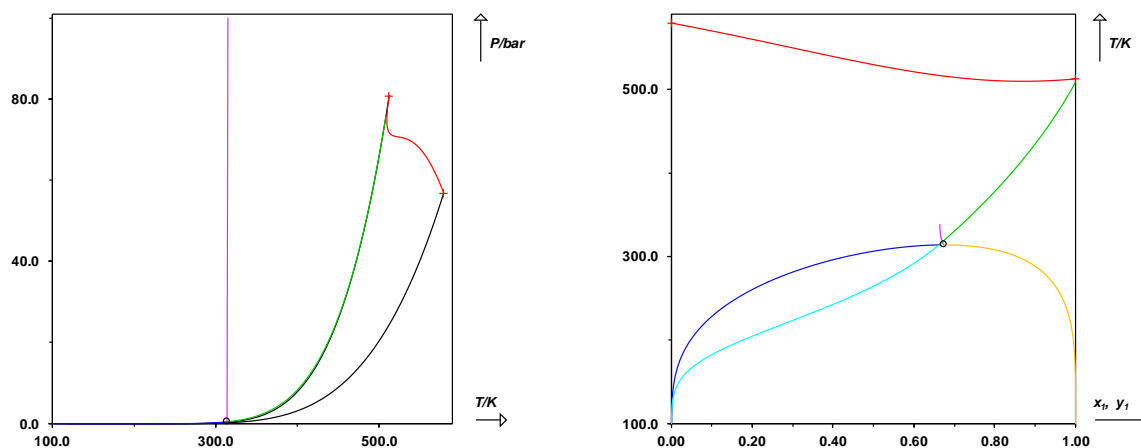
A/MPa = 193.0

B/MPa = 279.9

Deviations

MAPE on x = 27 %

MAPE on y = 15 %

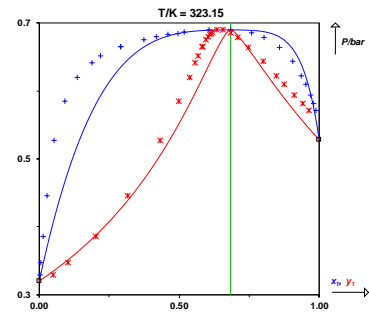
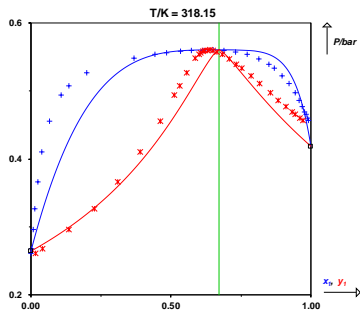
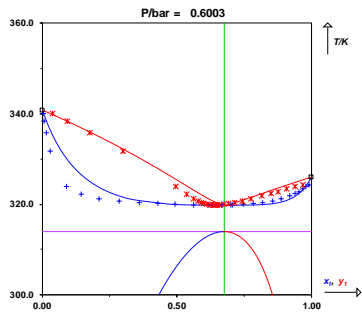


-----			0.3475	0.0050	0.1026
Isothermal phase equilibrium data			0.3863	0.0129	0.2019
-----			0.4459	0.0261	0.3154
Toghiani, Hossein - Toghiani, Rebecca K. - Viswanath, Dabir S., Vapor-liquid equilibria for the methanol-benzene and methanol-thiophene systems, Journal of Chemical & Engineering Data. 39 (1994) 63-67. doi:10.1021/je00013a018			0.5274	0.0526	0.4311
T / K = 318.15			0.5844	0.0919	0.4972
P / bar	x ₁	y ₁	0.6200	0.1357	0.5360
0.2613	0.0008	0.0171	0.6418	0.1879	0.5570
0.2676	0.0018	0.0407	0.6513	0.2179	0.5676
0.2960	0.0067	0.1357	0.6653	0.2895	0.5830
0.3268	0.0137	0.2259	0.6647	0.2901	0.5815
0.3656	0.0238	0.3110	0.6757	0.3743	0.5948
0.4102	0.0393	0.3907	0.6793	0.4185	0.6032
0.4559	0.0668	0.4608	0.6828	0.4583	0.6086
0.4934	0.1089	0.5111	0.6846	0.4948	0.6149
0.5072	0.1362	0.5310	0.6866	0.5183	0.6175
0.5266	0.1998	0.5575	0.6900	0.6050	0.6345
0.5487	0.3682	0.5876	0.6898	0.6843	0.6550
0.5536	0.4434	0.5999	0.6850	0.7578	0.6829
0.5560	0.4841	0.6058	0.6782	0.8038	0.7075
0.5580	0.5344	0.6144	0.6635	0.8587	0.7485
0.5592	0.5739	0.6211	0.6431	0.9042	0.7988
0.5600	0.6144	0.6298	0.6222	0.9362	0.8463
0.5601	0.6503	0.6387	0.6094	0.9518	0.8758
0.5595	0.6885	0.6494	0.5940	0.9681	0.9113
0.5576	0.7293	0.6638	0.5809	0.9803	0.9420
0.5539	0.7718	0.6824	0.5717	0.9880	0.9635
0.5473	0.8146	0.7078	-----		
0.5392	0.8498	0.7343	Isobaric phase equilibrium data		
0.5333	0.8698	0.7525	-----		
0.5222	0.8977	0.7852	Toghiani, Hossein - Toghiani, Rebecca K. - Viswanath, Dabir S., Vapor-liquid equilibria for the methanol-benzene and methanol-thiophene systems, Journal of Chemical & Engineering Data. 39 (1994) 63-67. doi:10.1021/je00013a018		
0.5106	0.9213	0.8172	P / bar = 0.6003		
0.4973	0.9428	0.8544	T / K	x ₁	y ₁
0.4865	0.9578	0.8842	339.97	0.0034	0.0366
0.4769	0.9695	0.9114	338.37	0.0067	0.0908
0.4694	0.9776	0.9327	335.83	0.0139	0.1760
0.4653	0.9820	0.9442	331.69	0.0279	0.3001
0.4601	0.9870	0.9595	323.93	0.0901	0.4953
0.4565	0.9908	0.9706	322.17	0.1448	0.5366
Toghiani, Hossein - Toghiani, Rebecca K. - Viswanath, Dabir S., Vapor-liquid equilibria for the methanol-benzene and methanol-thiophene systems, Journal of Chemical & Engineering Data. 39 (1994) 63-67. doi:10.1021/je00013a018			321.25	0.2089	0.5621
T / K = 323.15			320.67	0.2856	0.5790
P / bar	x ₁	y ₁	320.33	0.3609	0.5888
0.3296	0.0022	0.0506	320.11	0.4289	0.5993
			319.97	0.4924	0.6097
			319.86	0.5610	0.6221
			319.81	0.6153	0.6330

SA-HA systems (BAC = 8)

319.79	0.6310	0.6366
319.81	0.6531	0.6424
319.80	0.6667	0.6458
319.85	0.7002	0.6563
319.84	0.7046	0.6573
319.94	0.7462	0.6738
320.10	0.7826	0.6918
320.35	0.8186	0.7136
320.74	0.8564	0.7441
321.19	0.8867	0.7748
321.82	0.9174	0.8154
322.34	0.9377	0.8482
322.78	0.9519	0.8751
323.32	0.9667	0.9068
323.84	0.9787	0.9378
324.32	0.9893	0.9663

SA-HA systems (BAC = 8)



METHANOL (1) + 1,4-DIOXANE (2)

CAS	67-56-1	123-91-1
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	RYHBNJHYFVUHQT-UHFFFAOYSA-N
T_c / K	512.50	587.00
P_c / bar	80.84	52.08
ω	0.566	0.279

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 107.1$$

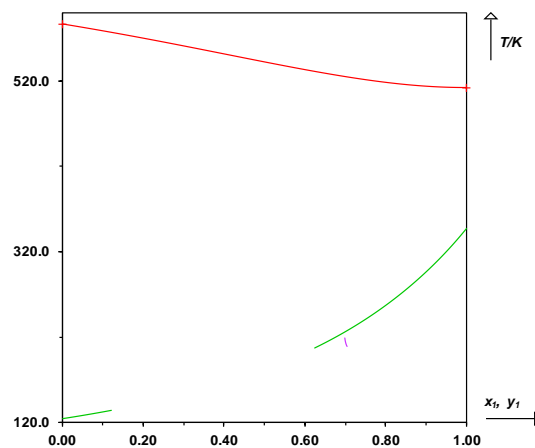
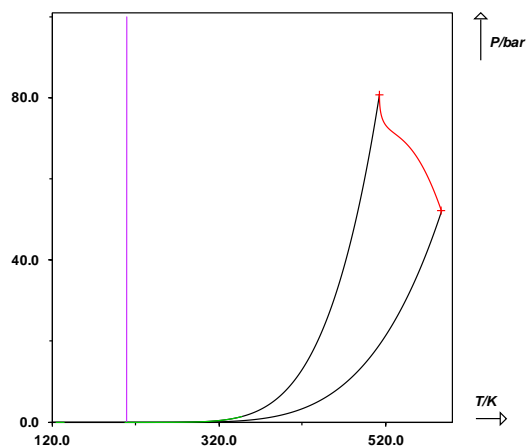
$$B/\text{MPa} = 117.6$$

Deviations

$$\text{MAPE on } x = 5.6 \%$$

$$\text{MAPE on } y = 2.2 \%$$

$$\text{MAPE on } h^M = 20 \%$$



Isothermal phase equilibrium data

Kortüm, G. - Valent, V., Thermodynamische Mischungseffekte der Systeme Wasser(1)-1,4-Dioxan(2) und Methanol(1)-1,4-Dioxan(2); ein Vergleich, Berichte der Bunsengesellschaft für physikalische Chemie. 81 (1977) 752-761. doi:10.1002/bbpc.19770810811

T / K = 308.15		
P / bar	x ₁	y ₁
0.1195	0.0700	0.3700
0.1301	0.0930	0.4270
0.1419	0.1140	0.4880
0.1571	0.1590	0.5540
0.1813	0.2290	0.6330
0.2030	0.3230	0.7030
0.2177	0.3860	0.7370
0.2283	0.4470	0.7660
0.2402	0.5410	0.7960
0.2507	0.6220	0.8250
0.2647	0.7680	0.8700
0.2708	0.8330	0.8980
0.2747	0.8940	0.9270
0.2776	0.9440	0.9560

Kortüm, G. - Valent, V., Thermodynamische Mischungseffekte der Systeme Wasser(1)-1,4-Dioxan(2) und Methanol(1)-1,4-Dioxan(2); ein Vergleich, Berichte der Bunsengesellschaft für physikalische Chemie. 81 (1977) 752-761. doi:10.1002/bbpc.19770810811

T / K = 323.15		
P / bar	x ₁	y ₁
0.2371	0.0790	0.3720
0.2503	0.0930	0.4140
0.2739	0.1200	0.4780
0.3054	0.1650	0.5510
0.3449	0.2280	0.6250
0.3931	0.3240	0.6950
0.4208	0.3870	0.7350
0.4425	0.4570	0.7610
0.4675	0.5440	0.7960
0.4896	0.6370	0.8290
0.5150	0.7510	0.8650
0.5322	0.8420	0.9040
0.5421	0.8940	0.9320
0.5483	0.9430	0.9580

Kortüm, G. - Valent, V., Thermodynamische Mischungseffekte der Systeme Wasser(1)-1,4-Dioxan(2) und Methanol(1)-1,4-Dioxan(2); ein Vergleich, Berichte der Bunsengesellschaft für physikalische Chemie. 81 (1977) 752-761. doi:10.1002/bbpc.19770810811

T / K = 333.15		
P / bar	x ₁	y ₁
0.3504	0.0810	0.3650
0.3638	0.0870	0.3860
0.4087	0.1280	0.4780
0.4533	0.1710	0.5520
0.5085	0.2310	0.6200
0.5756	0.3090	0.6870
0.6216	0.3830	0.7310
0.6552	0.4560	0.7610
0.7003	0.5680	0.8020
0.7315	0.6440	0.8270
0.7715	0.7620	0.8700
0.8025	0.8430	0.9060
0.8151	0.8940	0.9320
0.8288	0.9430	0.9600

Enthalpy of mixing

Ortega, J. - Chaar, M. - Placido, J., Excess enthalpies of 72 binary liquid mixtures of methyl n-alkanoates (C4 - C16) + alkan-1-ols (C2 - C10) at 298.15 K, ELDATA Int. Electron. J. Phys. Chem. Data. 1 (1995) 139-166.

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
370.00	0.0810
560.20	0.1290
668.60	0.1590
795.70	0.1970
816.60	0.2020
948.00	0.2580
1018.9	0.3000
1061.5	0.3220
1107.7	0.3600
1130.7	0.4350
1039.5	0.5860
939.70	0.6710
904.00	0.6920
799.90	0.7480
549.90	0.8480
409.10	0.8890
292.80	0.9240
179.60	0.9500

Tamura, Kazuhiro - Bhuiyan, Mohammad Mainul Hossain, Excess molar enthalpies of (methanol+1-propanol)+oxane or 1,4-dioxane mixtures at the temperature 298.15 K, The Journal of Chemical Thermodynamics. 35 (2003) 1657-1669. doi:10.1016/S0021-9614(03)00150-2

SA-HA systems (BAC = 8)

T / K =	298.15	1097.5	0.5500
P / bar =	UNKNOWN (1.0132)	1115.0	0.5000
$h^M / J.mol^{-1}$	x_1	1113.7	0.4500
250.81	0.0500	1090.6	0.4000
475.42	0.1000	1045.7	0.3500
650.60	0.1500	972.10	0.3000
796.29	0.2000	869.30	0.2500
902.19	0.2500	736.30	0.2000
988.17	0.3000	575.80	0.1500
1050.2	0.3500	407.30	0.1000

1086.7	0.4000
1102.0	0.4500
1096.0	0.5000
1079.9	0.5500
1040.9	0.6000
980.80	0.6500
902.79	0.7000
803.45	0.7500
687.83	0.8000
552.59	0.8500
394.89	0.9000
213.50	0.9500

Singh, P.P. - Verma, D.V. - Arora, P.S., Thermodynamics of binary methanol solutions, *Thermochimica Acta.* 15 (1976) 267-280. doi:10.1016/0040-6031(76)85080-0

T / K = 303.15
P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$	x_1
172.60	0.0569
406.45	0.1308
635.14	0.2068
776.23	0.2612
890.32	0.3150
1000.0	0.3950
1040.7	0.4655
1039.0	0.5102
1010.0	0.5550
960.03	0.5998
885.67	0.6430
760.02	0.7080
630.57	0.7580
536.83	0.7930
362.78	0.8564

Sitnyakovskii, I.B. - Gaile, A.A. - Semenov, L.V. - Koldobskaya, L.L. - Chupyra, O.S., Intermolecular interactions in dilute solutions of methanol in non-electrolytes, *Zh. Obshch. Khim.* 61 (1991) 2405-2410.

T / K = 298.15
P / bar = UNKNOWN (1.0132)

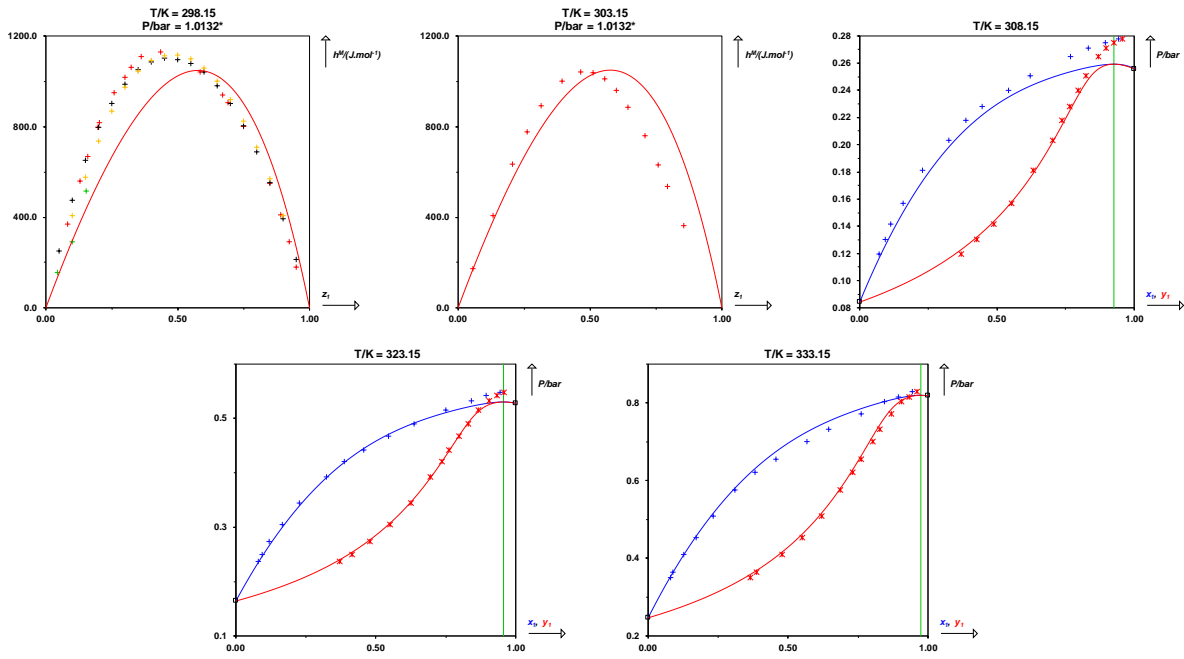
$h^M / J.mol^{-1}$	x_1
155.00	0.0450
293.00	0.0989
517.00	0.1539

Calvo, Encina - Brocos, Pilar - Piñeiro, Ángel - Pintos, Mercedes - Amigo, Alfredo - Bravo, Ramón - Roux, Alain H. - Roux-Desgranges, Geneviève, Heat Capacities, Excess Enthalpies, and Volumes of Mixtures Containing Cyclic Ethers. 4. Binary Systems 1,4-Dioxane + 1-Alkanols, *Journal of Chemical & Engineering Data.* 44 (1999) 948-954. doi:10.1021/je990078z

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$	x_1
406.10	0.9000
569.90	0.8500
708.70	0.8000
824.20	0.7500
919.30	0.7000
1001.2	0.6500
1059.4	0.6000

SA-HA systems (BAC = 8)



METHANOL (1) + ETHYL ACETATE (2)

CAS	67-56-1	141-78-6
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	XEKOWRVHYACXOJ-UHFFFAOYSA-N
T_c / K	512.50	523.30
P_c / bar	80.84	38.80
ω	0.566	0.366

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 115.4$$

$$B/\text{MPa} = 87.11$$

Deviations

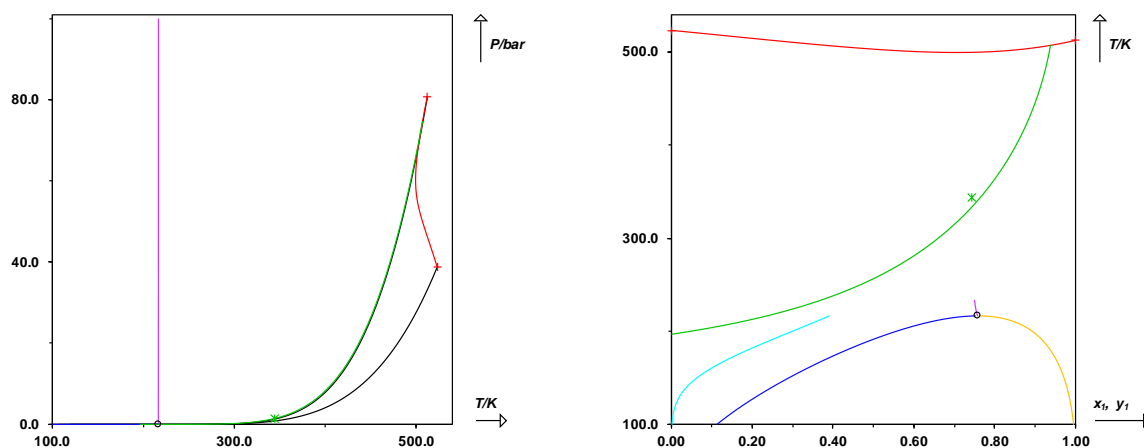
$$\text{MAPE on } x = 19\%$$

$$\text{MAPE on } y = 12\%$$

$$\text{MAPE on } x_{\text{az}} = 6.0\%$$

$$\text{MAPE on } P_{\text{az}} = 0.61\%$$

$$\text{MAPE on } h^{\text{M}} = 34\%$$



Isothermal phase equilibrium data

Staroske, J. - Figurski, G., Vapor-liquid equilibrium of the ternary system furfural - ethyl acetate - methanol and its binary subsystems at 298.15 K, Chem. Tech. Leipzig. 44 (1992) 64-66.

T / K = 298.15

P / bar	x ₁	y ₁
0.1351	0.0258	0.0937
0.1532	0.0825	0.2450
0.1584	0.1091	0.2832
0.1703	0.1652	0.3613
0.1740	0.1956	0.3852
0.1835	0.2719	0.4519
0.1904	0.3454	0.4907
0.1952	0.4495	0.5492
0.1987	0.5487	0.5913
0.1977	0.7425	0.6892
0.1944	0.8196	0.7490
0.1927	0.8448	0.7698
0.1883	0.8922	0.8137
0.1803	0.9509	0.8958
0.1772	0.9624	0.9206
0.1737	0.9811	0.9591

Murti, P. - Van Winkle, Matthew, Vapor-Liquid Equilibria for Binary Systems of Methanol, Ethyl Alcohol, 1-Propanol, and 2-Propanol with Ethyl Acetate and 1-Propanol-Water., Industrial & Engineering Chemistry Chemical & Engineering Data Series. 3 (1958) 72-81. doi:10.1021/i460003a016

T / K = 323.15

P / bar	x ₁	y ₁
0.4406	0.0525	0.1700
0.4980	0.1260	0.3375
0.5406	0.2315	0.4360
0.5800	0.3435	0.5125
0.6073	0.4500	0.5685
0.6126	0.5425	0.6170
0.6140	0.5680	0.6325
0.6153	0.6350	0.6640
0.6173	0.7060	0.6975
0.6153	0.7580	0.7290
0.6100	0.8215	0.7655
0.6033	0.8755	0.8100
0.5926	0.9250	0.8550

Nagata, Isamu - Yamada, Toshiro - Nakagawa, Shigeo, Excess Gibbs free energies and heats of mixing for binary systems ethyl acetate with methanol, ethanol, 1-propanol, and 2-propanol, Journal of Chemical &

Engineering Data. 20 (1975) 271-275. doi:10.1021/je60066a007

T / K = 328.15

P / bar	x ₁	y ₁
0.5080	0.0310	0.1160
0.6368	0.1660	0.3640
0.6581	0.2060	0.4060
0.7125	0.3390	0.5130
0.7394	0.4550	0.5730
0.7518	0.5410	0.6150
0.7574	0.6040	0.6490
0.7614	0.6600	0.6750
0.7622	0.7390	0.7250
0.7497	0.8620	0.8150
0.7379	0.9000	0.8560

Isobaric phase equilibrium data

Susial, Pedro - Sosa-Rosario, Aday - Rios-Santana, Raul, Vapor-Liquid Equilibria for Ethyl Acetate + Methanol at (0.1, 0.5, and 0.7) MPa. Measurements with a New Ebulliometer, Journal of Chemical & Engineering Data. 55 (2010) 5701-5706. doi:10.1021/je100614r

P / bar = 1.0000

T / K	x ₁	y ₁
337.65	0.9870	0.9740
337.35	0.9740	0.9510
336.85	0.9330	0.8990
336.65	0.9190	0.8830
336.35	0.8890	0.8510
335.95	0.8340	0.7990
335.85	0.8110	0.7800
335.75	0.6730	0.6960
335.95	0.6030	0.6640
336.15	0.5540	0.6390
336.25	0.5220	0.6210
336.45	0.4870	0.6030
336.75	0.4500	0.5840
337.05	0.4090	0.5640
337.95	0.3330	0.5220
338.45	0.2990	0.4990
339.65	0.2270	0.4360
342.75	0.1280	0.3160
343.95	0.0880	0.2450
344.85	0.0680	0.2070
345.95	0.0480	0.1680
347.05	0.0280	0.1080

Blanco, Ana M. - Ortega, Juan, Densities and Vapor-Liquid Equilibrium Values for Binary Mixtures Composed of

Methanol + an Ethyl Ester at 141.3 kPa with Application of an Extended Correlation Equation for Isobaric VLE Data, Journal of Chemical & Engineering Data. 43 (1998) 638-645. doi:10.1021/je980012o

P / bar = 1.413

T / K	x ₁	y ₁
358.69	0.0200	0.0780
357.55	0.0430	0.1340
356.19	0.0630	0.1900
355.14	0.0820	0.2340
354.16	0.1010	0.2700
352.66	0.1290	0.3250
350.14	0.1840	0.4090
348.66	0.2330	0.4650
347.51	0.2850	0.5060
346.74	0.3310	0.5360
346.05	0.3710	0.5650
345.68	0.4110	0.5790
345.02	0.4640	0.6120
344.65	0.5160	0.6360
344.32	0.5660	0.6600
344.07	0.6280	0.6860
343.90	0.6910	0.7160
343.85	0.7320	0.7330
343.80	0.7420	0.7420
344.01	0.8220	0.7910
344.18	0.8590	0.8210
344.67	0.9200	0.8810
344.95	0.9420	0.9070
345.21	0.9610	0.9300
345.58	0.9750	0.9490
345.88	0.9910	0.9810

Susial, Pedro - Sosa-Rosario, Aday - Rios-Santana, Raul, Vapor-Liquid Equilibria for Ethyl Acetate + Methanol at (0.1, 0.5, and 0.7) MPa. Measurements with a New Ebulliometer, Journal of Chemical & Engineering Data. 55 (2010) 5701-5706. doi:10.1021/je100614r

P / bar = 5.000

T / K	x ₁	y ₁
384.85	0.9780	0.9660
384.75	0.9710	0.9560
384.65	0.9610	0.9450
384.55	0.9550	0.9370
384.45	0.9420	0.9230
384.35	0.9280	0.9080
384.25	0.9080	0.8880
384.15	0.8870	0.8700
384.15	0.7600	0.7920
384.35	0.7110	0.7660
384.65	0.6560	0.7390

384.85	0.6300	0.7250
385.05	0.6120	0.7110
385.85	0.5330	0.6720
386.35	0.4990	0.6560
387.75	0.4090	0.6120
388.35	0.3800	0.5940
392.35	0.2270	0.4620
396.65	0.1280	0.3330
400.65	0.0680	0.2270
407.45	0.0090	0.0480

Enthalpy of mixing

Ortega, J., Excess enthalpy. Ethanol-ethyl ethanoate system, Int. Data Ser. Sel. Data Mixtures Ser. A. 23 (1995)

T / K = 298.15

P / bar = 1.010

h ^M / J.mol ⁻¹	z ₁
563.90	0.1260
858.90	0.2414
1041.3	0.3429
1102.8	0.4294
1094.4	0.5023
1044.6	0.5543
991.70	0.5940
935.30	0.6238
883.50	0.6578
810.70	0.6944
731.90	0.7305
641.90	0.7682
561.10	0.8057
476.00	0.8411
378.80	0.8786
277.90	0.9141
174.70	0.9484
83.00	0.9772

Zhang, Rui - Yan, Weidong - Wang, Xu - Lin, Ruisen, Molar excess enthalpies of ethyl acetate+alkanols at T=298.15K, p=10.0MPa, Thermochimica Acta. 429 (2005) 155-161. doi:10.1016/j.tca.2005.03.009

T / K = 298.15

P / bar = 100.00

h ^M / J.mol ⁻¹	z ₁
182.60	0.9430
272.50	0.9140
333.80	0.8870
523.20	0.8120
680.30	0.7430

SA-HA systems (BAC = 8)

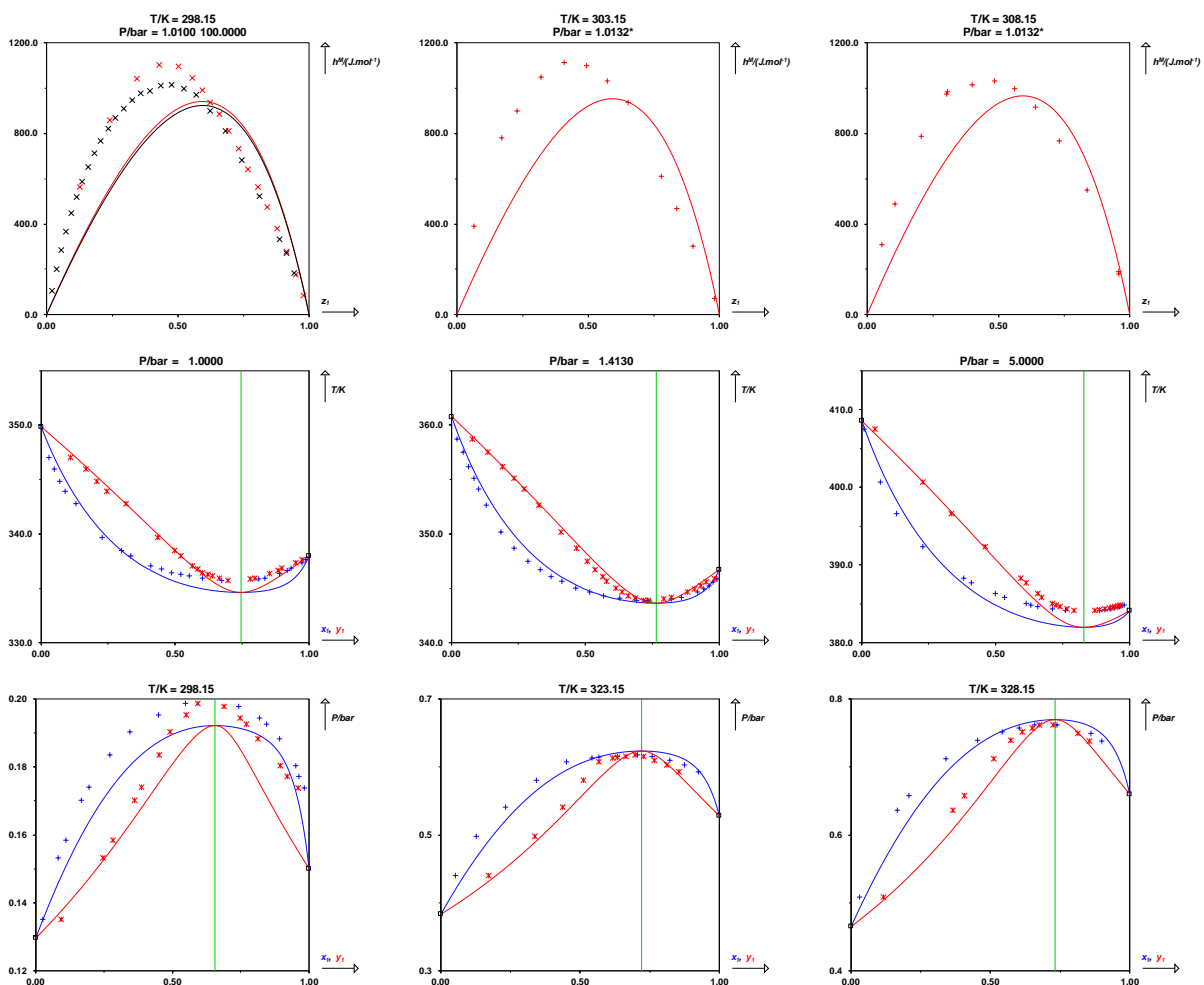
809.40	0.6810	T / K =	308.15
897.10	0.6230	P / bar =	UNKNOWN (1.0132)
968.30	0.5700	$h^M / \text{J.mol}^{-1}$	x_1
995.80	0.5220	308.15	0.0569
1013.3	0.4760	487.34	0.1065
1009.1	0.4340	785.44	0.2057
987.00	0.3950	974.27	0.3030
977.40	0.3590	983.06	0.3056
945.30	0.3250	1013.2	0.3986
910.20	0.2930	1031.2	0.4850
869.60	0.2620	998.55	0.5610
821.80	0.2340	916.07	0.6414
767.60	0.2070	767.44	0.7314
711.30	0.1820	549.73	0.8370
651.30	0.1580	188.41	0.9569
585.40	0.1360	180.45	0.9576
518.10	0.1140		
446.50	0.0940		
367.70	0.0740		
284.60	0.0560		
200.10	0.0380		
105.90	0.0210		

Rajendran, M. - Renganarayanan, S. - Madhavan, P.R. - Srinivasan, D., Effect Of Dissolved Inorganic Salts On The Vapor-Liquid Equilibria And Enthalpy Of Mixing Of The Methanol-Ethyl Acetate System, Chemical Engineering Communications. 74 (1988) 179-193.
doi:10.1080/00986448808940458

T / K =	303.15
P / bar =	UNKNOWN (1.0132)
$h^M / \text{J.mol}^{-1}$	x_1
389.37	0.0650
780.54	0.1700
898.57	0.2300
1047.9	0.3210
1111.8	0.4080
1097.8	0.4940
1029.4	0.5720
937.59	0.6530
608.80	0.7800
468.08	0.8370
302.20	0.9000
69.84	0.9810

Nagata, Isamu - Yamada, Toshiro - Nakagawa, Shigeo, Excess Gibbs free energies and heats of mixing for binary systems ethyl acetate with methanol, ethanol, 1-propanol, and 2-propanol, Journal of Chemical & Engineering Data. 20 (1975) 271-275.
doi:10.1021/je60066a007

SA-HA systems (BAC = 8)



METHANOL (1) + METHYL tert-BUTYL ETHER (2)

CAS	67-56-1	1634-04-4
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	BZLVMXJERCZMT-UHFFFAOYSA-N
T_c / K	512.50	497.10
P_c / bar	80.84	32.86
ω	0.566	0.247

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 136.9$$

$$B/\text{MPa} = -29.45$$

Deviations

$$\text{MAPE on } x = 34 \%$$

$$\text{MAPE on } y = 19 \%$$

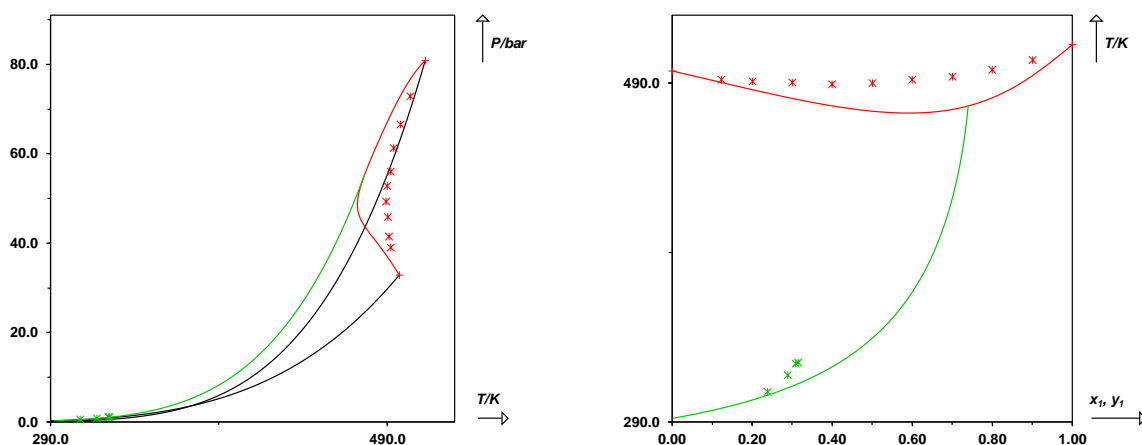
$$\text{MAPE on } x_c = 48 \%$$

$$\text{MAPE on } P_c = 17 \%$$

$$\text{MAPE on } x_{az} = 18 \%$$

$$\text{MAPE on } P_{az} = 0.61 \%$$

$$\text{MAPE on } h^M = 63 \%$$



Isothermal phase equilibrium data

Toghiani, Rebecca K - Toghiani, Hossein - Venkateswarlu, Gundapaneni, Vapor-liquid equilibria for methyl tert-butyl ether + methanol and tert-amyl methyl ether + methanol, Fluid Phase Equilibria. 122 (1996) 157-168.

doi:10.1016/0378-3812(96)03043-9

T / K = 313.15

P / bar	x ₁	y ₁
0.3603	0.9972	0.9803
0.3659	0.9939	0.9613
0.3739	0.9887	0.9366
0.3927	0.9744	0.8860
0.4251	0.9488	0.8076
0.4410	0.9347	0.7603
0.4514	0.9259	0.7384
0.4659	0.9120	0.7031
0.4775	0.9005	0.6804
0.4936	0.8818	0.6503
0.5063	0.8654	0.6217
0.5141	0.8546	0.6085
0.5250	0.8398	0.5836
0.5356	0.8227	0.5681
0.5462	0.8063	0.5481
0.5546	0.7899	0.5340
0.5621	0.7752	0.5188
0.5717	0.7551	0.4990
0.5823	0.7343	0.4844
0.5932	0.7034	0.4592
0.5986	0.6876	0.4497
0.6069	0.6634	0.4402
0.6129	0.6396	0.4203
0.6225	0.6035	0.4028
0.6311	0.5658	0.3871
0.6378	0.5283	0.3692
0.6452	0.4809	0.3502
0.6501	0.4431	0.3358
0.6541	0.4060	0.3228
0.6577	0.3673	0.3034
0.6618	0.2884	0.2720
0.6622	0.2239	0.2370
0.6598	0.1766	0.2077
0.6584	0.1621	0.1991
0.6522	0.1194	0.1643
0.6347	0.0595	0.0991
0.6236	0.0360	0.0680

Lee, J.D. - Lee, T.J. - Park, S.J., Infinite dilution activity coefficients and vapor-liquid equilibria for the binary

systems containing MTBE, Hwahak Konghak. 33 (1995) 527-534.

T / K = 318.15

P / bar	x ₁	y ₁
0.4489	0.9995	0.9970
0.4534	0.9972	0.9850
0.4721	0.9859	0.9358
0.4979	0.9701	0.8737
0.5415	0.9384	0.7801
0.5847	0.9040	0.6991
0.6246	0.8638	0.6322
0.6569	0.8240	0.5816
0.6891	0.7761	0.5332
0.7229	0.7032	0.4820
0.7482	0.6332	0.4409
0.7664	0.5512	0.4063
0.7834	0.4536	0.3621
0.7937	0.3335	0.3101
0.7894	0.1873	0.2261
0.7696	0.0970	0.1485
0.7515	0.0543	0.0936
0.7234	0.0079	0.0163

Fárková, Jana - Linek, Jan - Wichterle, Ivan, Isothermal vapour-liquid equilibria and excess volumes in the methanol-aliphatic ether systems, Fluid Phase Equilibria. 109 (1995) 53-65. doi:10.1016/0378-3812(95)02710-V

T / K = 325.00

P / bar	x ₁	y ₁	
0.6149	0.9957	0.9714	
0.6812	0.9619	0.8528	
0.7601	0.9158	0.7389	
0.7947	0.8911	0.6967	
0.8407	0.8506	0.6352	
0.8905	0.7918	0.5759	
0.9444	0.7111	0.5112	
0.9871	0.6062	0.4526	
0.9950	0.5772	0.4377	
1.011	0.5087	0.4064	
1.023	0.4471	0.3779	
1.030	0.3786	0.3466	
1.032	0.3140	0.3140	AZEO
1.032	0.3040	0.3097	
1.027	0.2397	0.2723	
1.021	0.1932	0.2420	
0.9967	0.1158	0.1772	
0.9502	0.0413	0.0790	

Toghiani, Rebecca K - Toghiani, Hossein - Venkateswarlu, Gundapaneni, Vapor-liquid equilibria for methyl tert-butyl ether + methanol and tert-amyl methyl ether + methanol,

SA-HA systems (BAC = 8)

Fluid Phase Equilibria.	122	(1996)	157-168.	319.82	0.9714	0.8768	
doi:10.1016/0378-3812(96)03043-9				319.37	0.9639	0.8544	
T / K =	333.15			318.75	0.9549	0.8254	
P / bar	x₁	y₁		318.14	0.9447	0.7946	
0.8550	0.9978	0.9879		317.52	0.9344	0.7654	
0.8696	0.9934	0.9660		316.66	0.9185	0.7273	
0.8946	0.9844	0.9337		315.94	0.9046	0.6949	
0.9213	0.9734	0.9000		315.26	0.8881	0.6640	
0.9505	0.9607	0.8642		314.42	0.8656	0.6264	
0.9715	0.9514	0.8359		313.95	0.8519	0.6059	
1.005	0.9362	0.7986		313.40	0.8343	0.5827	
1.043	0.9175	0.7543		313.05	0.8221	0.5632	
1.078	0.8980	0.7183		313.01	0.8201	0.5623	
1.107	0.8799	0.6907		312.73	0.8111	0.5539	
1.114	0.8733	0.6775		311.96	0.7767	0.5182	
1.134	0.8596	0.6589		311.98	0.7790	0.5170	
1.157	0.8422	0.6362		311.54	0.7572	0.4977	
1.178	0.8250	0.6184		311.21	0.7396	0.4854	
1.199	0.8038	0.6005		310.90	0.7226	0.4701	
1.216	0.7864	0.5755		310.52	0.6964	0.4530	
1.250	0.7473	0.5512		310.14	0.6715	0.4362	
1.266	0.7236	0.5278		309.75	0.6398	0.4182	
1.287	0.6915	0.5050		309.47	0.6127	0.4011	
1.302	0.6636	0.4916		309.20	0.5837	0.3875	
1.317	0.6349	0.4758		308.90	0.5494	0.3712	
1.334	0.5951	0.4537		308.58	0.5014	0.3556	
1.343	0.5658	0.4395		308.26	0.4491	0.3297	
1.358	0.5148	0.4226		308.04	0.4001	0.3101	
1.369	0.4646	0.3978		307.87	0.3554	0.2918	
1.377	0.4108	0.3744		307.71	0.2886	0.2627	
1.379	0.3770	0.3609		307.65	0.2380	0.2380	AZEO
1.381	0.3242	0.3323		307.66	0.2372	0.2379	
1.375	0.2572	0.2958		307.82	0.1510	0.1868	
1.356	0.1767	0.2424		308.02	0.1154	0.1570	
1.217	0.0198	0.0420		308.45	0.0727	0.1112	
				308.97	0.0425	0.0748	
				309.67	0.0134	0.0253	

Isobaric phase equilibrium data

Toghiani, Rebecca K - Toghiani, Hossein - Venkateswarlu, Gundapaneni, Vapor-liquid equilibria for methyl tert-butyl ether + methanol and tert-amyl methyl ether + methanol, Fluid Phase Equilibria. 122 (1996) 157-168. doi:10.1016/0378-3812(96)03043-9

P / bar = 0.5333

T / K	x ₁	y ₁
321.97	0.9981	0.9881
321.61	0.9946	0.9689
320.94	0.9864	0.9299
320.50	0.9806	0.9117

Loras, Sonia - Aucejo, Antonio - Muñoz, Rosa - Wisniak, Jaime, Azeotropic Behavior in the System Methanol + Methyl 1,1-Dimethylethyl Ether, Journal of Chemical & Engineering Data. 44 (1999) 203-208. doi:10.1021/je9801563

P / bar = 0.7840

T / K	x ₁	y ₁
329.64	0.9853	0.9381
328.10	0.9687	0.8695
325.49	0.9263	0.7475
323.21	0.8642	0.6367
321.86	0.8104	0.5732

SA-HA systems (BAC = 8)

320.95	0.7695	0.5362		325.45	0.5858	0.4295	
320.22	0.7205	0.5011		325.26	0.5627	0.4185	
319.26	0.6650	0.4583		325.08	0.5362	0.4064	
318.53	0.5865	0.4255		324.94	0.5126	0.3962	
318.24	0.5453	0.4055		324.79	0.4831	0.3834	
318.02	0.5019	0.3864		324.61	0.4439	0.3673	
317.87	0.4540	0.3677		324.51	0.4141	0.3547	
317.71	0.4045	0.3483		324.45	0.3927	0.3450	
317.63	0.3568	0.3249		324.40	0.3673	0.3343	
317.62	0.3089	0.3017		324.37	0.3440	0.3237	
317.58	0.2890	0.2890	AZEO	324.33	0.3211	0.3131	
317.59	0.2695	0.2801		324.32	0.3090	0.3090	AZEO
317.61	0.2401	0.2627		324.33	0.2908	0.2984	
317.74	0.1940	0.2377		324.34	0.2797	0.2930	
317.93	0.1582	0.2083		324.35	0.2770	0.2919	
318.33	0.1082	0.1673		324.37	0.2557	0.2806	
318.97	0.0620	0.1129		324.41	0.2304	0.2659	
319.67	0.0289	0.0607		324.50	0.2072	0.2516	

Arce, Alberto - Martínez-Ageitos, José - Soto, Ana, VLE Measurements of Binary Mixtures of Methanol, Ethanol, 2-Methoxy-2-methylpropane, and 2-Methoxy-2-methylbutane at 101.32 kPa, Journal of Chemical & Engineering Data. 41 (1996) 718-723. doi:10.1021/je950323o

P / bar = 1.013

T / K	x ₁	y ₁
337.05	0.9929	0.9690
336.48	0.9859	0.9413
335.58	0.9724	0.8959
334.85	0.9617	0.8614
334.33	0.9532	0.8382
333.39	0.9363	0.7914
332.82	0.9263	0.7620
332.42	0.9176	0.7430
331.96	0.9080	0.7235
331.52	0.8980	0.7024
331.07	0.8857	0.6833
330.58	0.8726	0.6611
330.07	0.8577	0.6391
329.62	0.8435	0.6204
328.87	0.8155	0.5903
328.43	0.7963	0.5714
327.94	0.7743	0.5501
327.54	0.7533	0.5323
327.18	0.7317	0.5149
326.77	0.7067	0.4965
326.39	0.6793	0.4783
326.05	0.6511	0.4608
325.72	0.6176	0.4437

Wang, Y. - Tong, A. - Su, Y. - Yang, Z., Isobaric Vapor-Liquid Equilibrium for the System MTBE-Methanol, Shiyou Huagong. 18 (1989) 442-446.

P / bar = 5.000

T / K	x ₁	y ₁
383.36	0.9851	0.9555
381.91	0.9446	0.8694
381.33	0.9319	0.8441
380.16	0.9018	0.7998
378.56	0.8487	0.7376
377.88	0.8201	0.7045
376.94	0.7795	0.6702
376.57	0.7465	0.6481
376.10	0.7029	0.6151
375.63	0.6712	0.5890
375.02	0.5316	0.5215
374.94	0.4617	0.4849
375.33	0.3582	0.4224
375.70	0.3142	0.4059
376.24	0.2386	0.3494
377.05	0.1901	0.3136
378.23	0.1365	0.2625
380.18	0.0859	0.1945
382.94	0.0398	0.1136

-----		269.80	0.1339
Enthalpy of mixing		205.50	0.0920
-----		133.80	0.0566
Tusel-Langer, E. - Garcia Alonso, J. M. - Villamañan Olfos, M. A. - Lichtenthaler, R. N., Excess enthalpies of mixtures containing n-heptane, methanol and methyl tert-butyl ether (MTBE), Journal of Solution Chemistry. 20 (1991) 153-163. doi:10.1007/BF00651647		Tusel-Langer, E. - Garcia Alonso, J. M. - Villamañan Olfos, M. A. - Lichtenthaler, R. N., Excess enthalpies of mixtures containing n-heptane, methanol and methyl tert-butyl ether (MTBE), Journal of Solution Chemistry. 20 (1991) 153-163. doi:10.1007/BF00651647	
T / K =	298.15	T / K =	323.15
P / bar =	1.010	P / bar =	1.010
$h^M / \text{J.mol}^{-1}$	z_1	$h^M / \text{J.mol}^{-1}$	z_1
-7.300	0.9787	-1.700	0.9787
-7.600	0.9636	2.800	0.9636
-5.800	0.9475	9.400	0.9475
2.500	0.9216	23.40	0.9216
14.90	0.8932	46.10	0.8932
76.00	0.8022	125.50	0.8022
159.20	0.6977	225.50	0.6977
228.80	0.6021	310.30	0.6021
283.60	0.5079	379.30	0.5079
325.80	0.3920	429.40	0.3920
328.20	0.2860	432.10	0.2860
300.60	0.2035	393.00	0.2035
217.70	0.1090	274.20	0.1090
128.10	0.0566	165.00	0.0566
Tusel-Langer, E. - Garcia Alonso, J. M. - Villamañan Olfos, M. A. - Lichtenthaler, R. N., Excess enthalpies of mixtures containing n-heptane, methanol and methyl tert-butyl ether (MTBE), Journal of Solution Chemistry. 20 (1991) 153-163. doi:10.1007/BF00651647		Westerholt, A., Weiterentwicklung der Gruppenbeitragszustandsgleichung VTPR zur Beschreibung der TAME-Synthese und Spaltung durch systematische Messung fehlender Phasengleichgewichtsdaten und Anpassung der erforderlichen Parameter, Master's Thesis. (2010) 1-113.	
T / K =	313.15	T / K =	333.15
P / bar =	1.010	P / bar =	9.290
$h^M / \text{J.mol}^{-1}$	z_1	$h^M / \text{J.mol}^{-1}$	z_1
-7.500	0.9824	23.90	0.9448
1.800	0.9635	67.90	0.8896
4.900	0.9536	124.43	0.8344
8.000	0.9433	185.28	0.7790
12.70	0.9326	247.66	0.7236
17.10	0.9216	306.01	0.6682
28.60	0.8981	361.33	0.6129
87.40	0.8150	417.69	0.5572
145.50	0.7746	465.81	0.5018
176.60	0.7062	495.37	0.4463
253.70	0.6126	499.22	0.3905
323.60	0.4947	498.64	0.3347
360.00	0.4234	484.77	0.2791
378.20	0.3414	448.00	0.2233
366.70	0.2956	386.10	0.1675
355.50	0.2461		
323.60	0.1923		

285.91	0.1118	503.50	72.87	0.9000
153.77	0.0560			

Gmehling, J. - Park, S. J. - Fischer, K. - Meents, B., Excess enthalpies of tert-butyl methyl ether, methanol, or ethanol+ butane or+ 2-methylpropene, Int. DATA Ser. Sel. Data Mixtures, Ser. A. 20 (1992) 146-152.

T / K = 363.15

P / bar = 6.000

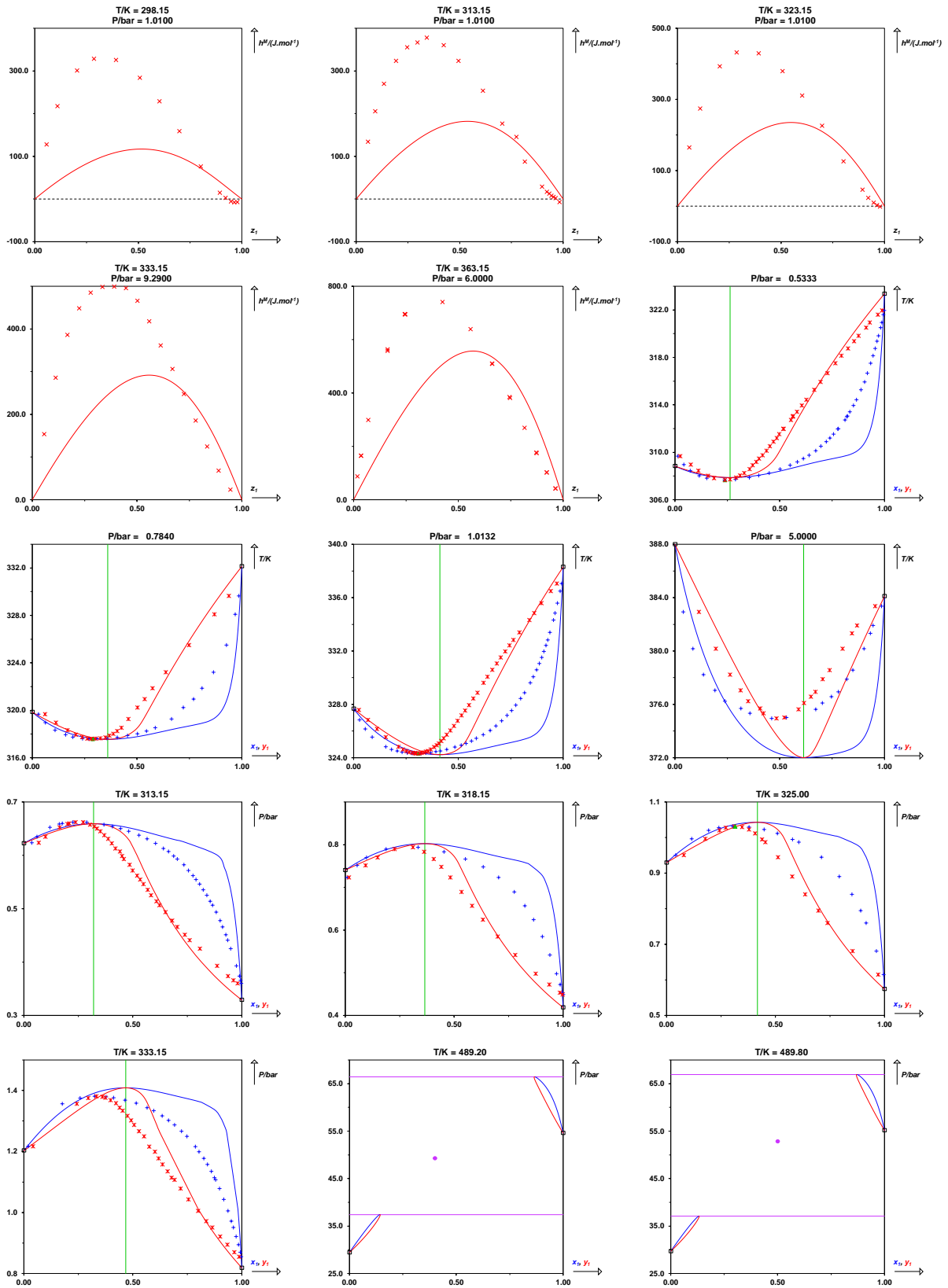
$h^M / \text{J.mol}^{-1}$	z_1
42.47	0.9636
42.69	0.9632
101.86	0.9216
101.78	0.9208
174.41	0.8728
177.08	0.8714
269.71	0.8160
381.75	0.7462
384.94	0.7439
509.17	0.6622
509.99	0.6595
639.59	0.5575
741.11	0.4236
694.50	0.2462
696.03	0.2440
694.05	0.2440
563.34	0.1623
558.17	0.1623
299.33	0.0693
165.80	0.0355
164.88	0.0355
87.68	0.0179

Critical point

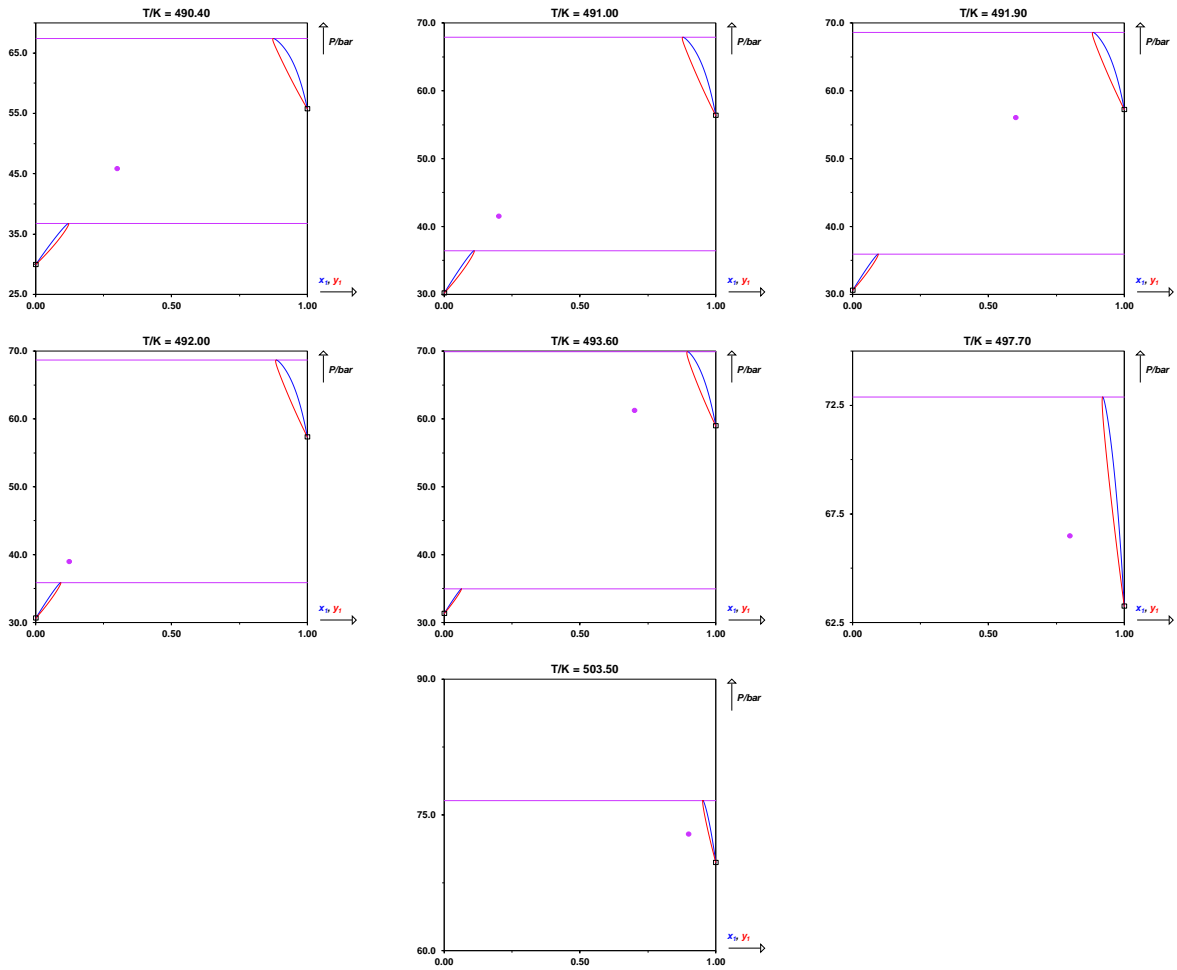
Han, Kewei - Xia, Shuqian - Ma, Peisheng - Yan, Fangyou - Liu, Tao, Measurement of critical temperatures and critical pressures for binary mixtures of methyl tert-butyl ether (MTBE)+alcohol and MTBE+alkane, The Journal of Chemical Thermodynamics. 62 (2013) 111-117. doi:10.1016/j.jct.2013.03.002

T / K	P / bar	x_1
489.20	49.26	0.3997
489.80	52.81	0.5003
490.40	45.83	0.3001
491.00	41.52	0.2007
491.90	56.05	0.6003
492.00	38.97	0.1231
493.60	61.24	0.7002
497.70	66.48	0.8001

SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



METHANOL (1) + DIISOPROPYL ETHER (2)

CAS	67-56-1	108-20-3
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	ZAFNJMIOTHYJRJ-UHFFFAOYSA-N
T_c / K	512.50	500.05
P_c / bar	80.84	28.80
ω	0.566	0.339

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 222.7$$

$$B/\text{MPa} = -36.16$$

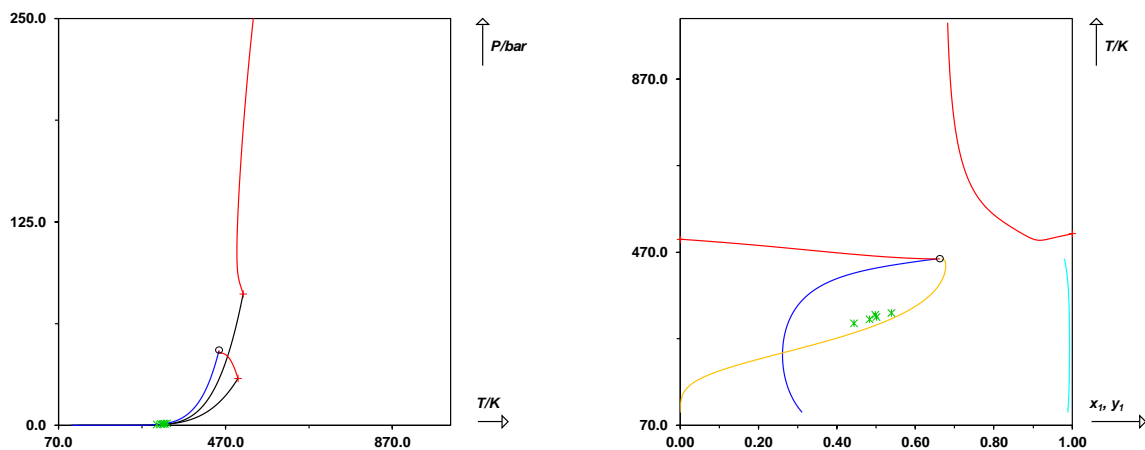
Deviations

$$\text{MAPE on } x = 52\%$$

$$\text{MAPE on } y = 12\%$$

$$\text{MAPE on } h^M = 55\%$$

$$\text{MAPE on } c_p^M = 32\%$$



Isothermal phase equilibrium data				0.6145	0.1410	0.4030
				0.5876	0.1020	0.3710
				0.5251	0.0550	0.2780
Reddy, Prashant - Benecke, Travis P. - Ramjugernath, Deresh, Isothermal (vapour+liquid) equilibria for binary mixtures of diisopropyl ether with (methanol, or ethanol, or 1-butanol): Experimental data, correlations, and predictions, The Journal of Chemical Thermodynamics. 58 (2013) 330-339. doi:10.1016/j.jct.2012.11.005				Fárková, Jana - Linek, Jan - Wichterle, Ivan, Isothermal vapour-liquid equilibria and excess volumes in the methanol-aliphatic ether systems, Fluid Phase Equilibria. 109 (1995) 53-65. doi:10.1016/0378-3812(95)02710-V		
T / K = 305.15				T / K = 320.00		
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁
0.3291	0.9490	0.6980		0.5202	0.0318	0.1012
0.3739	0.8930	0.5900		0.5424	0.0514	0.1530
0.3956	0.8420	0.5410		0.6017	0.1212	0.2737
0.4119	0.7810	0.5050		0.6250	0.1628	0.3206
0.4229	0.6900	0.4630		0.6609	0.2692	0.3979
0.4236	0.6040	0.4550		0.6750	0.3503	0.4390
0.4243	0.5320	0.4500		0.6843	0.4789	0.4914
0.4245	0.4730	0.4470		0.6847	0.5000	0.5000
0.4247	0.4610	0.4440		0.6828	0.5847	0.5273
0.4249	0.4540	0.4390		0.6737	0.6842	0.5753
0.4252	0.4430	0.4430	AZEO	0.6534	0.7789	0.6348
0.4253	0.4290	0.4350		0.6240	0.8533	0.6996
0.4233	0.3680	0.4520		0.5880	0.9094	0.7697
0.4195	0.2410	0.4330		0.5487	0.9535	0.8489
0.4115	0.1710	0.4130		0.5182	0.9764	0.9153
0.3975	0.1190	0.3810		0.4998	0.9899	0.9588
0.3551	0.0540	0.2770		Reddy, Prashant - Benecke, Travis P. - Ramjugernath, Deresh, Isothermal (vapour+liquid) equilibria for binary mixtures of diisopropyl ether with (methanol, or ethanol, or 1-butanol): Experimental data, correlations, and predictions, The Journal of Chemical Thermodynamics. 58 (2013) 330-339. doi:10.1016/j.jct.2012.11.005		
Reddy, Prashant - Benecke, Travis P. - Ramjugernath, Deresh, Isothermal (vapour+liquid) equilibria for binary mixtures of diisopropyl ether with (methanol, or ethanol, or 1-butanol): Experimental data, correlations, and predictions, The Journal of Chemical Thermodynamics. 58 (2013) 330-339. doi:10.1016/j.jct.2012.11.005				T / K = 325.15		
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁
0.4391	0.9890	0.8780		0.6886	0.9790	0.8740
0.4939	0.9630	0.7600		0.7589	0.9550	0.7710
0.5456	0.9290	0.6640		0.8285	0.9210	0.6800
0.5819	0.8910	0.6090		0.9096	0.8410	0.5910
0.6206	0.8000	0.5470		0.9647	0.7000	0.5290
0.6453	0.6740	0.5110		0.9687	0.5410	0.5100
0.6562	0.5420	0.4900		0.9683	0.5120	0.5050
0.6537	0.4930	0.4870		0.9684	0.4990	0.5000
0.6555	0.4820	0.4820	AZEO	0.9684	0.4980	0.4980
0.6557	0.4810	0.4840		0.9685	0.4960	0.4910
0.6568	0.4740	0.4820		0.9694	0.4510	0.4870
0.6486	0.4130	0.4750		0.9684	0.3730	0.4850
0.6452	0.2940	0.4590		0.9676	0.3110	0.4840
0.6396	0.2210	0.4420		0.9575	0.2580	0.4640
				0.9367	0.1910	0.4400
				0.8687	0.0990	0.3730

SA-HA systems (BAC = 8)

0.7695	0.0430	0.2720		-25.50	0.8460
				-34.80	0.8740
Fárková, Jana - Linek, Jan - Wichterle, Ivan, Isothermal vapour-liquid equilibria and excess volumes in the methanol-aliphatic ether systems, Fluid Phase Equilibria. 109 (1995) 53-65. doi:10.1016/0378-3812(95)02710-V				-37.90	0.9280
				-35.50	0.9630
				-26.10	0.9760
T / K =				-12.70	0.9860
				-6.100	0.9930
T / K =	330.00				
P / bar	x_1	y_1			
0.7321	0.0247	0.0824			
0.7917	0.0619	0.1761			
0.8441	0.0975	0.2484			
0.9251	0.1858	0.3480			
0.9992	0.3681	0.4631			
1.015	0.5187	0.5248			
1.016	0.5307	0.5295			
1.016	0.5390	0.5390	AZEO		
1.011	0.6314	0.5691			
0.9950	0.7310	0.6158			
0.9836	0.7680	0.6428			
0.9410	0.8481	0.7122			
0.9151	0.8805	0.7472			
0.8811	0.9139	0.7920			
0.8360	0.9494	0.8531			
0.7979	0.9729	0.9085			
0.7780	0.9835	0.9409			
0.7570	0.9939	0.9742			

Heat capacity of mixing

Piñeiro, Ángel, Excess volumes and isobaric heat capacities of diisopropyl ether with several alkanols at 298.15K, Fluid Phase Equilibria. 216 (2004) 245-256. doi:10.1016/j.fluid.2003.11.003

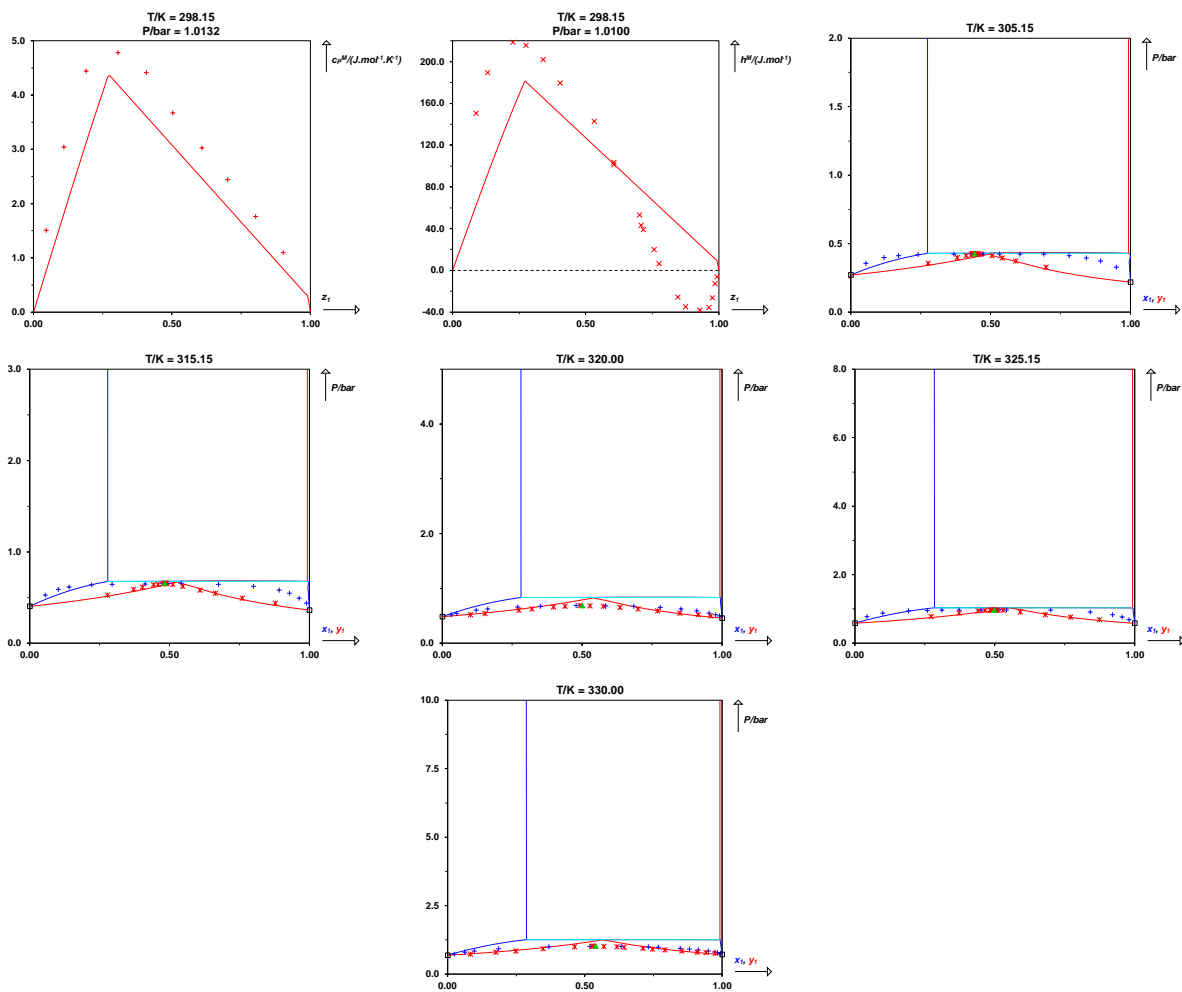
T / K =	298.15
P / bar =	UNKNOWN (1.0132)
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
1.510	0.0458
3.040	0.1096
4.440	0.1903
4.780	0.3043
4.410	0.4080
3.670	0.5023
3.030	0.6080
2.440	0.7011
1.760	0.8023
1.100	0.9011

Enthalpy of mixing

Letcher, Trevor M. - Govender, Penny U., Excess Molar Enthalpies of an Alkanol + a Branched Chain Ether at the Temperature 298.15 K, Journal of Chemical & Engineering Data. 40 (1995) 997-1000. doi:10.1021/jc00020a060

T / K =	298.15
P / bar =	1.010
$h^M / \text{J.mol}^{-1}$	z_1
150.40	0.0880
189.60	0.1320
218.60	0.2270
215.60	0.2760
202.00	0.3400
179.40	0.4040
142.60	0.5320
103.30	0.6050
101.40	0.6060
53.20	0.7020
43.30	0.7080
39.20	0.7160
20.00	0.7560
6.400	0.7750

SA-HA systems (BAC = 8)



METHANOL (1) + n-BUTYL ACETATE (2)

CAS	67-56-1	123-86-4
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	DKPFZGUDAPQIHT-UHFFFAOYSA-N
T_c / K	512.50	575.40
P_c / bar	80.84	30.90
ω	0.566	0.439

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 118.7$$

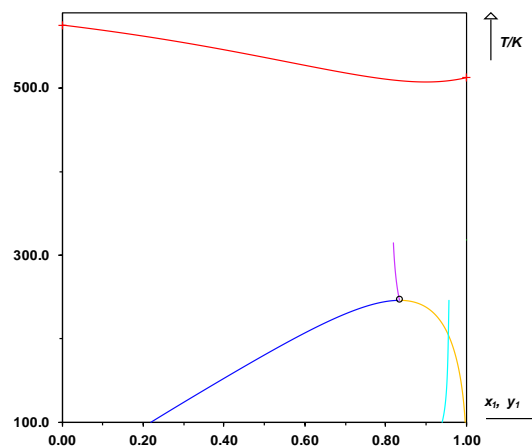
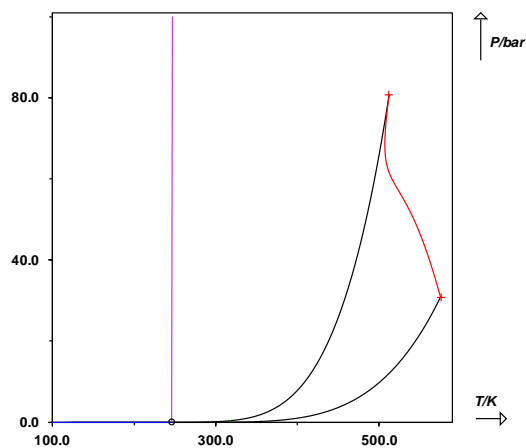
$$B/\text{MPa} = 66.13$$

Deviations

$$\text{MAPE on } x = 17\%$$

$$\text{MAPE on } y = 6.6\%$$

$$\text{MAPE on } h^M = 36\%$$



Isothermal phase equilibrium data

Sieg, L. - Cruetzen, J.L. - Jost, W., Zur Thermodynamik von Mischphasen VIII. Über das Verdampfungsgleichgewicht Methanol-n-Butylazetat, Z. Elektrochem. Angew. Phys. Chem. 55 (1951) 199-201.
 doi:10.1002/bbpc.19510550307

T / K = 296.65

P / bar	x ₁	y ₁
0.0365	0.0500	0.6000
0.0589	0.1060	0.7510
0.0781	0.2000	0.8330
0.1087	0.4030	0.8980
0.1181	0.5400	0.9100
0.1325	0.7450	0.9430
0.1396	0.8310	0.9570
0.1513	0.9480	0.9860

Sieg, L. - Cruetzen, J.L. - Jost, W., Zur Thermodynamik von Mischphasen VIII. Über das Verdampfungsgleichgewicht Methanol-n-Butylazetat, Z. Elektrochem. Angew. Phys. Chem. 55 (1951) 199-201.
 doi:10.1002/bbpc.19510550307

T / K = 313.15

P / bar	x ₁	y ₁
0.1213	0.1060	0.7520
0.1413	0.1380	0.7810
0.1731	0.2000	0.8270
0.2091	0.2960	0.8650
0.2277	0.3780	0.8810
0.2476	0.4720	0.8970
0.2596	0.5430	0.9090
0.2706	0.5880	0.9160
0.2740	0.6140	0.9200
0.2897	0.7000	0.9340
0.2978	0.7490	0.9440
0.3098	0.8180	0.9540
0.3160	0.8590	0.9570

Sieg, L. - Cruetzen, J.L. - Jost, W., Zur Thermodynamik von Mischphasen VIII. Über das Verdampfungsgleichgewicht Methanol-n-Butylazetat, Z. Elektrochem. Angew. Phys. Chem. 55 (1951) 199-201.
 doi:10.1002/bbpc.19510550307

T / K = 333.15

P / bar	x ₁	y ₁
0.2477	0.0760	0.6500
0.3466	0.1450	0.7520
0.4486	0.2510	0.8270
0.4942	0.3060	0.8520
0.5896	0.4780	0.8930

0.6470	0.6060	0.9120
0.7002	0.7180	0.9350
0.7331	0.7930	0.9410
0.7845	0.9000	0.9660

Isobaric phase equilibrium data

Park, W.K., Vapor-liquid equilibriums of ester-alcohol systems. III, Hwahak Konghak. 9 (1971) 181-190.

P / bar = 1.013

T / K	x ₁	y ₁
379.15	0.0500	0.5050
367.15	0.1000	0.6750
361.25	0.1500	0.7530
356.95	0.2000	0.7970
353.75	0.2500	0.8290
351.15	0.3000	0.8510
349.25	0.3500	0.8670
347.65	0.4000	0.8800
346.35	0.4500	0.8910
345.15	0.5000	0.9010
344.15	0.5500	0.9100
343.35	0.6000	0.9180
342.65	0.6500	0.9270
342.05	0.7000	0.9360
341.35	0.7500	0.9430
340.65	0.8000	0.9520
339.95	0.8500	0.9620
339.35	0.9000	0.9720
338.55	0.9500	0.9850

Espiau, Fernando - Ortega, Juan - Penco, Eduvigis - Wisniak, Jaime, Advances in the Correlation of Thermodynamic Properties of Binary Systems Applied to Methanol Mixtures with Butyl Esters, Industrial & Engineering Chemistry Research. 49 (2010) 9548-9558.
 doi:10.1021/ie101165r

P / bar = 1.413

T / K	x ₁	y ₁
407.30	0.0074	0.1137
401.98	0.0198	0.2483
397.67	0.0318	0.3359
393.88	0.0426	0.4098
387.50	0.0658	0.5229
383.43	0.0837	0.5800
378.35	0.1151	0.6549
373.23	0.1476	0.7135
368.85	0.1853	0.7601
365.34	0.2239	0.7970
361.80	0.2755	0.8281

SA-HA systems (BAC = 8)

358.65	0.3377	0.8505	966.90	0.6669
356.45	0.3906	0.8686	869.20	0.7055
353.95	0.4587	0.8896	792.60	0.7447
352.61	0.5307	0.9015	681.10	0.7860
351.55	0.5937	0.9126	556.30	0.8274
350.39	0.6716	0.9249	451.70	0.8683
349.25	0.7249	0.9343	326.20	0.9055
348.55	0.7650	0.9425	238.50	0.9338
348.07	0.8114	0.9500	153.60	0.9598
347.57	0.8672	0.9585	70.80	0.9812
347.11	0.8901	0.9668		
346.78	0.9234	0.9758		
346.35	0.9519	0.9838		
346.10	0.9721	0.9913		

Espiau, Fernando - Ortega, Juan - Penco, Eduvigis - Wisniak, Jaime, Advances in the Correlation of Thermodynamic Properties of Binary Systems Applied to Methanol Mixtures with Butyl Esters, Industrial & Engineering Chemistry Research. 49 (2010) 9548-9558. doi:10.1021/ie101165r

Enthalpy of mixing

Sieg, L. - Cruetzen, J.L. - Jost, W., Zur Thermodynamik von Mischphasen VIII. Über das Verdampfungsgleichgewicht Methanol-n-Butylazetat, Z. Elektrochem. Angew. Phys. Chem. 55 (1951) 199-201. doi:10.1002/bbpc.19510550307

T / K = 293.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

502.42	0.1010
816.43	0.1890
1113.7	0.3330
1172.3	0.4480
1118.7	0.5420
1000.6	0.6300
602.06	0.8130
440.03	0.8670

Ortega, J., Excess enthalpy. Ethanol-ethyl ethanoate system, Int. Data Ser. Sel. Data Mixtures Ser. A. 23 (1995)

T / K = 298.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

647.60	0.1201
930.30	0.2117
1086.7	0.2807
1159.3	0.3369
1200.2	0.3953
1203.1	0.4478
1186.7	0.4973
1150.0	0.5414
1103.5	0.5825
1051.2	0.6137

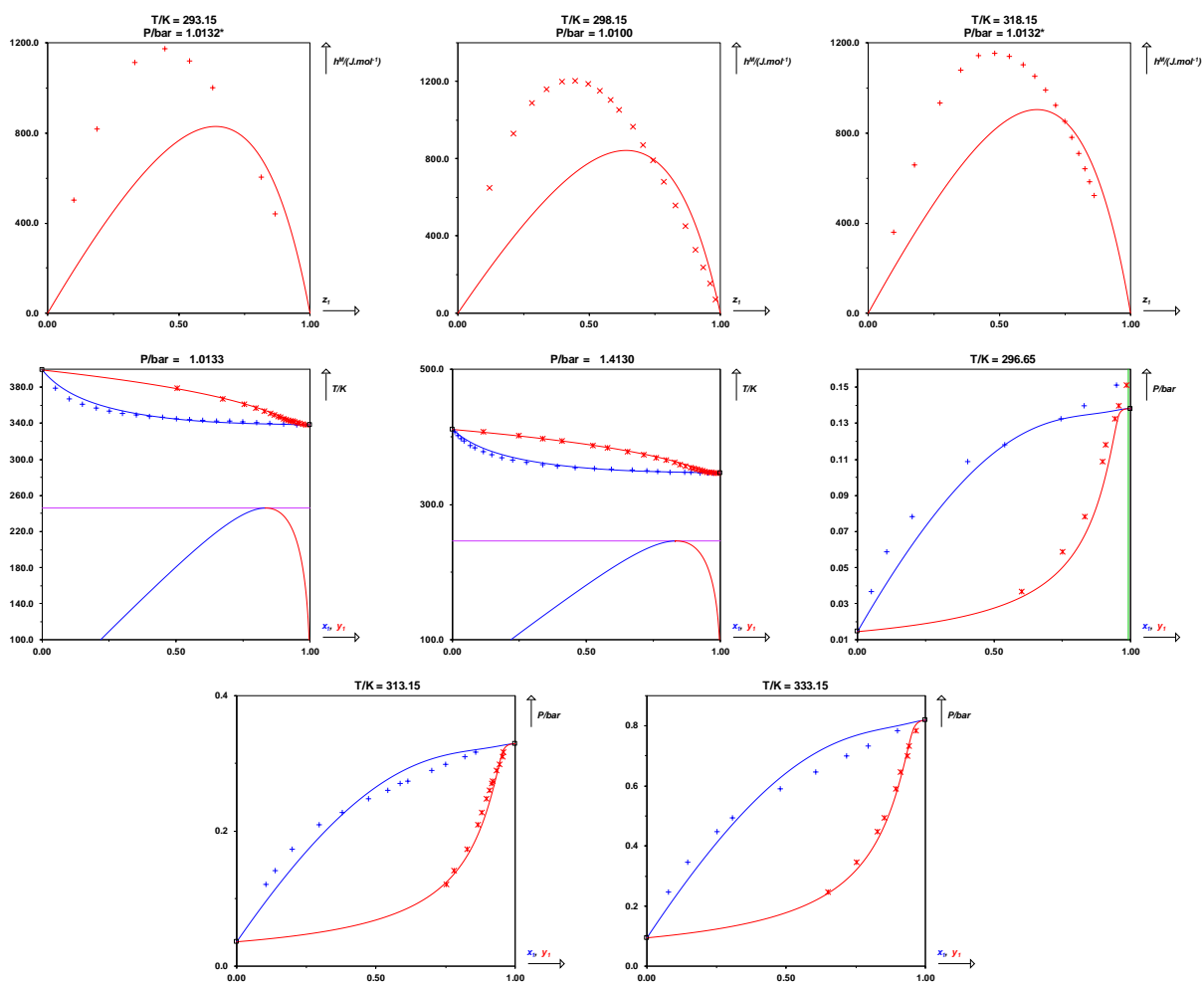
T / K = 318.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

360.00	0.0956
658.00	0.1761
932.00	0.2722
1077.0	0.3517
1143.0	0.4208
1152.0	0.4831
1141.0	0.5375
1102.0	0.5894
1052.0	0.6350
991.00	0.6767
922.00	0.7139
852.00	0.7483
779.00	0.7771
710.00	0.8031
641.00	0.8247
582.00	0.8445
522.00	0.8617

SA-HA systems (BAC = 8)



ACETONITRILE (1) + 1,4-DIOXANE (2)

CAS	75-05-8	123-91-1
InChiKey	WEVYAHXRMPXWCK-UHFFFAOYSA-N	RYHBNJHYFVUHQT-UHFFFAOYSA-N
T_c / K	545.50	587.00
P_c / bar	48.50	52.08
ω	0.342	0.279

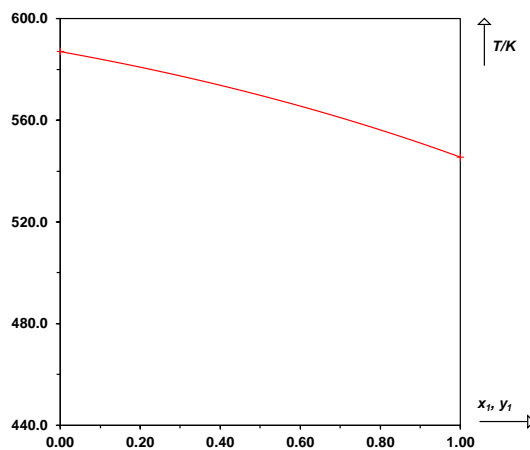
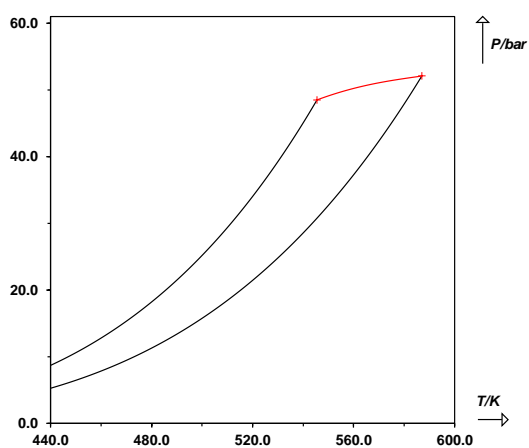
Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

 $A/\text{MPa} = -8.475$ $B/\text{MPa} = -0.955$

Deviations

MAPE on $x = 68\%$ MAPE on $y = 38\%$ MAPE on $h^M = 55\%$ MAPE on $c_p^M = 12\%$ 

Isothermal phase equilibrium data

Davolio, Franco - Pedrosa, Graciela C. - Katz, Miguel, Vapor-liquid equilibrium for the p-dioxane-acetonitrile system at 298.15 K, Journal of Chemical & Engineering Data. 26 (1981) 26-27. doi:10.1021/je00023a011

T / K = 298.15

P / bar	x ₁	y ₁
0.0569	0.0700	0.2035
0.0605	0.1012	0.2738
0.0694	0.1870	0.4188
0.0752	0.2535	0.5029
0.0827	0.3530	0.5987
0.0891	0.4494	0.6765
0.0914	0.4830	0.6998
0.0981	0.5995	0.7728
0.1030	0.6930	0.8285
0.1090	0.8000	0.8875
0.1133	0.8875	0.9360

Francesconi, Romolo - Comelli, Fabio, Excess thermodynamic properties for the binary system 1,4-dioxane-acetonitrile at 40.degree.C, Journal of Chemical & Engineering Data. 33 (1988) 80-83. doi:10.1021/je00052a004

T / K = 313.15

P / bar	x ₁	y ₁
0.2200	0.9010	0.9380
0.2151	0.8490	0.9060
0.2091	0.7890	0.8710
0.2040	0.7320	0.8370
0.1960	0.6570	0.7890
0.1895	0.5950	0.7460
0.1851	0.5500	0.7180
0.1771	0.4830	0.6610
0.1651	0.3780	0.5870
0.1571	0.3130	0.5300
0.1511	0.2630	0.4790
0.1400	0.1840	0.3900
0.1311	0.1280	0.3090
0.1280	0.1100	0.2820
0.1175	0.0600	0.1800
0.1091	0.0260	0.0940

Enthalpy of mixing

Francesconi, Romolo - Comelli, Fabio, Excess thermodynamic properties for the binary system 1,4-dioxane-acetonitrile at 40.degree.C, Journal of Chemical

& Engineering Data. 33 (1988) 80-83. doi:10.1021/je00052a004

T / K = 313.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
11.40	0.0200
22.70	0.0390
25.50	0.0480
30.20	0.0630
35.60	0.0920
38.70	0.1190
37.70	0.1680
33.20	0.2120
21.80	0.2880
9.400	0.3500
3.900	0.3770
-7.600	0.4470
-23.40	0.5480
-28.80	0.6180
-31.60	0.6860
-32.00	0.7080
-31.10	0.7640
-23.60	0.8660
-15.60	0.9060
-5.500	0.9510
-1.900	0.9750
-2.100	0.9850

Heat capacity of mixing

Grolier, J. -P. E. - Roux-Desgranges, G. - Berkane, M. - Wilhelm, Emmerich, Heat capacities and densities of mixtures of very polar substances 1. Mixtures containing acetonitrile, The Journal of Chemical Thermodynamics. 23 (1991) 421-429. doi:10.1016/S0021-9614(05)80130-2

T / K = 298.15

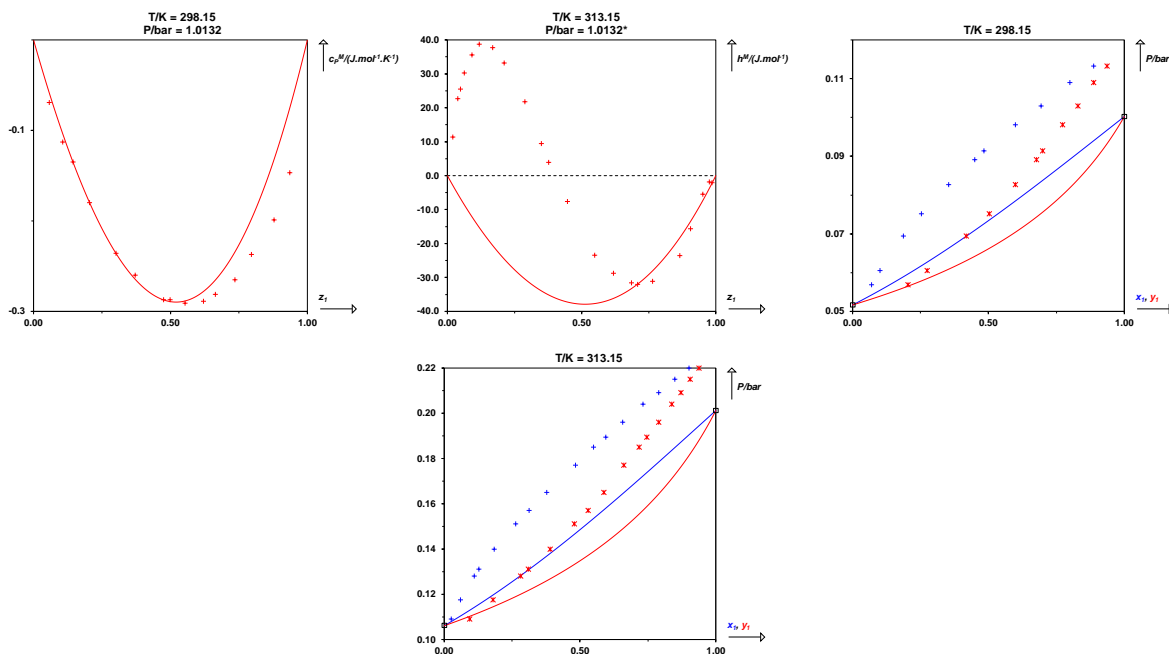
P / bar = UNKNOWN (1.0132)

cp ^M / J.mol ⁻¹ .K ⁻¹	x ₁
-0.0690	0.0572
-0.1130	0.1063
-0.1350	0.1438
-0.1800	0.2048
-0.2360	0.3013
-0.2600	0.3708
-0.2870	0.4751
-0.2870	0.4982
-0.2910	0.5532
-0.2890	0.6205
-0.2810	0.6633

SA-HA systems (BAC = 8)

-0.2650	0.7355
-0.2370	0.7953
-0.1990	0.8774
-0.1470	0.9354

SA-HA systems (BAC = 8)



CARBON DIOXIDE (1) + ETHANOL (2)

CAS	124-38-9	64-17-5
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	LFQSCWFLJHTTHZ-UHFFFAOYSA-N
T_c / K	304.21	514.00
P_c / bar	73.83	61.37
ω	0.224	0.644

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 136.0$

$B/\text{MPa} = 199.0$

Deviations

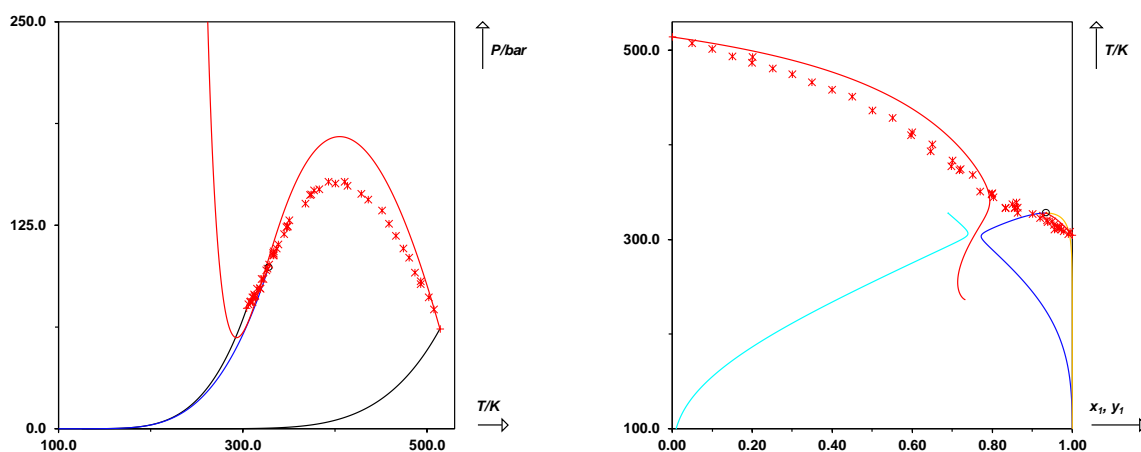
MAPE on $x = 12\%$

MAPE on $y = 16\%$

MAPE on $x_c = 22\%$

MAPE on $P_c = 9.9\%$

MAPE on $h^M = 41\%$



-----				40.80	0.3540	0.9960	
Isothermal phase equilibrium data				45.30	0.3999	0.9963	
-----				49.80	0.4610	0.9962	
Guo, L. - Wu, X.-H. - Zheng, D.-X. - Deng, W., Measurement and Correlation of Vapor-Liquid Equilibrium for the Carbon Dioxide + 1-Butoxy Butane System, Journal of Chemical & Engineering Data. 55 (2010) 476-478. doi:10.1021/je900231r				53.70	0.5161	0.9959	
T / K = 293.15				58.80	0.6169	0.9952	
P / bar	x ₁	y ₁		62.40	0.6719	0.9950	
7.500	0.0555	0.9886		65.70	0.7326	0.9943	
16.00	0.1292	0.9948		68.20	0.7866	0.9913	
22.20	0.1755	0.9972		69.80	0.8855	0.9904	
Secuianu, Catinca - Feroiu, Viorel - Geană, Dan, Phase behavior for carbon dioxide+ethanol system: Experimental measurements and modeling with a cubic equation of state, The Journal of Supercritical Fluids. 47 (2008) 109-116. doi:10.1016/j.supflu.2008.08.004				Tanaka, Hiroyuki - Kato, Masahiro, Vapor-liquid equilibrium properties of carbon dioxide + ethanol mixture at high pressures., JOURNAL OF CHEMICAL ENGINEERING OF JAPAN. 28 (1995) 263-266. doi:10.1252/jcej.28.263			
T / K = 293.15				T / K = 308.15			
P / bar	x ₁	y ₁		P / bar	x ₁	y ₁	
6.800	0.0497	0.9879		15.52	0.1098	0.9833	
16.70	0.1315	0.9950		26.16	0.1904	0.9892	
21.40	0.1692	0.9967		49.41	0.3755	0.9942	
28.70	0.2417	0.9978		57.32	0.4587	0.9915	
35.40	0.3062	0.9983		59.92	0.5160	0.9952	
46.20	0.4870	0.9978		65.95	0.6152	0.9953	
Day, Chany-Yih - Chang, Chiehming J. - Chen, Chiu-Yang, Phase Equilibrium of Ethanol + CO ₂ and Acetone + CO ₂ at Elevated Pressures, Journal of Chemical & Engineering Data. 41 (1996) 839-843. doi:10.1021/je960049d				66.15	0.6415	0.9954	
T / K = 298.17				68.65	0.7206	0.9924	
P / bar	x ₁	y ₁		69.18	0.7511	0.9898	
11.60	0.1305	0.9855		70.12	0.8010	0.9956	
16.20	0.1865	0.9873		70.63	0.8376	0.9978	
22.80	0.2624	0.9895		72.46	0.9289	0.9971	
29.60	0.3273	0.9906		74.28	0.9687	0.9978	
36.50	0.4103	0.9918		74.73	0.9752	0.9951	
43.40	0.5172	0.9905		76.04	0.9926	0.9963	
53.90	0.6866	0.9879		77.12	0.9944	0.9964	
58.20	0.8139	0.9860		77.48	0.9945	0.9960	
Yao, S. - Liu, F. - Han, Z. - Zhu, Z., Vapor-liquid equilibria of binary systems of alcohols, water-carbon dioxide at supercritical or near critical condition, Gaoxiao Huaxue Gongcheng Xuebao. 3 (1989) 9-15.				77.94	0.9940	0.9940	CRIT
T / K = 304.65				Tochigi, Katsumi - Namae, Tooru - Suga, Tooru - Matsuda, Hiroyuki - Kurihara, Kiyofumi - dos Ramos, M. Carolina - McCabe, Clare, Measurement and prediction of high-pressure vapor-liquid equilibria for binary mixtures of carbon dioxide+n-octane, methanol, ethanol, and perfluorohexane, The Journal of Supercritical Fluids. 55 (2010) 682-689. doi:10.1016/j.supflu.2010.10.016			
P / bar	x ₁	y ₁		T / K = 313.14			
22.20	0.1834	0.9959		P / bar	x ₁	y ₁	
28.40	0.2420	0.9963		6.130	0.0480	0.9685	
35.90	0.3050	0.9966		10.54	0.0751	0.9813	
				15.46	0.1031	0.9859	
				20.51	0.1375	0.9922	
				25.82	0.1710	0.9916	
				30.41	0.1933	0.9942	

SA-HA systems (BAC = 8)

35.55	0.2267	0.9948	91.40	0.9162	0.9470
40.37	0.2606	0.9942	91.80	0.9192	0.9297
45.52	0.2832	0.9948	92.10	0.9198	0.9198 CRIT
50.44	0.3313	0.9947			
55.33	0.3709	0.9943			
60.61	0.4123	0.9938			
65.58	0.4550	0.9928			
70.87	0.5236	0.9926			
74.27	0.6095	0.9925			
77.16	0.7261	0.9890			
Day, Chany-Yih - Chang, Chiehming J. - Chen, Chiu-Yang, Phase Equilibrium of Ethanol + CO ₂ and Acetone + CO ₂ at Elevated Pressures, Journal of Chemical & Engineering Data. 41 (1996) 839-843. doi:10.1021/je960049d			Brandt, L., Einsatz überkritischer Fluide für die Trenntechnik, Thesis. (2011) 1-128.		
T / K =	313.14		T / K =	328.15	
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
9.100	0.0529	0.9849	11.57	0.0420	0.9160
18.40	0.1009	0.9864	19.75	0.0940	0.9630
29.20	0.1718	0.9877	31.25	0.1560	0.9730
39.30	0.2280	0.9894	43.33	0.2180	0.9740
45.00	0.2800	0.9905	45.74	0.2300	0.9800
49.70	0.3200	0.9912	79.87	0.4780	0.9720
54.90	0.3609	0.9918	90.05	0.5830	0.9760
59.00	0.3999	0.9922	93.83	0.6520	0.9590
63.10	0.4398	0.9912	98.91	0.8170	0.9450
66.50	0.4897	0.9900	Suzuki, Kazuhiko - Sue, Haruhusa - Itou, Masahiro - Smith, Richard L. - Inomata, Hiroshi - Arai, Kunio - Saito, Shozaburo, Isothermal vapor-liquid equilibrium data for binary systems at high pressures: carbon dioxide-methanol, carbon dioxide-ethanol, carbon dioxide-1-propanol, methane-ethanol, methane-1-propanol, ethane-ethanol, and ethane-1-propanol systems, Journal of Chemical & Engineering Data. 35 (1990) 63-66. doi:10.1021/je00059a020		
70.20	0.5399	0.9886	T / K =	333.40	
73.10	0.5844	0.9865	P / bar	x ₁	y ₁
76.00	0.6593	0.9823	5.440	0.0200	0.9050
77.30	0.7492	0.9770	9.910	0.0380	0.9470
79.20	0.8210	0.9725	21.10	0.0880	0.9720
Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO ₂ -alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1			30.30	0.1290	0.9780
T / K =	322.50		40.43	0.1690	0.9810
P / bar	x ₁	y ₁	49.93	0.2170	0.9820
5.700	0.0302	0.9406	60.94	0.2780	0.9810
25.60	0.1272	0.9804	75.29	0.3720	0.9790
38.10	0.1908	0.9844	90.24	0.4940	0.9720
48.50	0.2514	0.9853	99.49	0.6100	0.9540
58.60	0.3180	0.9855	105.18	0.7260	0.9340
77.40	0.4887	0.9809	105.80	0.7630	0.9230
84.60	0.6091	0.9753	106.54	0.8170	0.9080
87.90	0.7056	0.9704	Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO ₂ -alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1		
89.80	0.7878	0.9645	T / K =	333.40	
			P / bar	x ₁	y ₁

SA-HA systems (BAC = 8)

6.600	0.0285	0.9141	
27.30	0.1172	0.9716	
37.50	0.1618	0.9750	
58.30	0.2666	0.9778	
71.80	0.3456	0.9780	
87.00	0.4629	0.9707	
95.40	0.5534	0.9647	
103.70	0.7091	0.9373	
104.50	0.7333	0.9299	
106.10	0.8323	0.8906	
106.40	0.8633	0.8633	CRIT

Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO₂-alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1

T / K = 344.75

P / bar	x ₁	y ₁	
8.000	0.0307	0.8727	
28.30	0.1082	0.9543	
38.80	0.1492	0.9617	
60.30	0.2448	0.9678	
70.60	0.2941	0.9679	
92.80	0.4253	0.9614	
102.70	0.5024	0.9523	
114.00	0.6346	0.9252	
116.30	0.6720	0.9076	
119.00	0.7734	0.8494	
119.30	0.8008	0.8068	
119.70	0.8020	0.8020	CRIT

Galicia-Luna, Luis A. - Ortega-Rodriguez, A. - Richon, D., New Apparatus for the Fast Determination of High-Pressure Vapor-Liquid Equilibria of Mixtures and of Accurate Critical Pressures, Journal of Chemical & Engineering Data. 45 (2000) 265-271. doi:10.1021/je990187d

T / K = 348.40

P / bar	x ₁	y ₁	
15.15	0.0576	0.9176	
35.15	0.1391	0.9606	
55.18	0.2213	0.9618	
76.34	0.3285	0.9599	
106.07	0.5193	0.9425	
120.02	0.6718	0.9003	
123.01	0.7273	0.8851	
124.60	0.7980	0.7980	CRIT

Yi-Ling Tian - Ming Han - Li Chen - Ji-Jun Feng - Ying Qin, Study on Vapor-Liquid Phase Equilibria for CO₂-C₂H₅OH System, Wuli Huaxue Xuebao. 17 (2001) 155-160.

T / K = 353.15

P / bar	x ₁	y ₁	
55.00	0.2097	0.9825	
70.00	0.2798	0.9854	
80.00	0.3184	0.9840	
90.00	0.3682	0.9890	
110.00	0.4926	0.9637	
120.00	0.5714	0.9510	

Secuianu, Catinca - Feroiu, Viorel - Geană, Dan, Phase behavior for carbon dioxide+ethanol system: Experimental measurements and modeling with a cubic equation of state, The Journal of Supercritical Fluids. 47 (2008) 109-116. doi:10.1016/j.supflu.2008.08.004

T / K = 353.15

P / bar	x ₁	y ₁	
5.200	0.0187	0.7819	
14.50	0.0596	0.8933	
30.00	0.1096	0.9464	
41.50	0.1536	0.9604	
52.70	0.2037	0.9656	
64.20	0.2471	0.9695	
74.80	0.2948	0.9703	
79.70	0.3185	0.9704	
85.30	0.3439	0.9692	
95.50	0.4077	0.9650	
100.80	0.4359	0.9610	
110.80	0.4951	0.9471	

Galicia-Luna, Luis A. - Ortega-Rodriguez, A. - Richon, D., New Apparatus for the Fast Determination of High-Pressure Vapor-Liquid Equilibria of Mixtures and of Accurate Critical Pressures, Journal of Chemical & Engineering Data. 45 (2000) 265-271. doi:10.1021/je990187d

T / K = 373.00

P / bar	x ₁	y ₁	
21.76	0.0649	0.8827	
42.20	0.1350	0.9165	
61.51	0.2054	0.9328	
91.65	0.3358	0.9161	
120.24	0.4790	0.9120	
128.21	0.5303	0.8980	
141.14	0.6593	0.8297	
143.45	0.7181	0.7181	CRIT

Mendoza de la Cruz, J.L. - Galicia-Luna, L.A., High-pressure vapor-liquid equilibria for the carbon dioxide + ethanol and carbon dioxide + 1-propanol systems at temperatures

from 322.36 K to 391.96 K, ELDATA Int. Electron. J. Phys. Chem. Data. 5 (1999) 157-164.

T / K =	391.96	
P / bar	x_1	y_1
13.20	0.0290	0.6670
30.30	0.0820	0.7940
46.70	0.1340	0.8480
60.20	0.1800	0.8640
79.30	0.2440	0.8730
103.61	0.3330	0.8830
120.31	0.4150	0.8730
141.11	0.5390	0.8310
146.21	0.5960	0.8040

Enthalpy of mixing

Hauser, Raul A. - Zhao, Jian Ping - Tremaine, Peter R. - Mather, Alan E., Excess molar enthalpies of six (carbon dioxide + a polar solvent) mixtures at the temperatures 298.15 K and 308.15 K and pressures from 7.5 MPa to 12.6 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 1303-1317. doi:10.1006/jcht.1996.0115

T / K = 298.15

P / bar = 75.00

$h^M / \text{J.mol}^{-1}$	z_1
-78.80	0.0508
-131.90	0.1006
-171.70	0.1495
-200.00	0.1975
-214.20	0.2447
-220.60	0.2909
-218.90	0.3363
-215.40	0.3810
-195.50	0.4248
-179.60	0.4678
-159.70	0.5102
-139.00	0.5517
-117.30	0.5926
-92.40	0.6328
-67.90	0.6723
-41.70	0.7111
-15.40	0.7493
11.90	0.7869
38.10	0.8239
60.50	0.8602
80.50	0.8960
89.00	0.9312
84.50	0.9659

Cordray, D.R. - Izatt, R.M. - Christensen, J.J. - Oscarson, J.L., The excess enthalpies of (carbon dioxide + ethanol) at 308.15, 325.15, 373.15, 413.15, and 473.15 K from 5.00 to 14.91 MPa, The Journal of Chemical Thermodynamics. 20 (1988) 655-663. doi:10.1016/0021-9614(88)90016-X

T / K = 308.15

P / bar = 125.00

$h^M / \text{J.mol}^{-1}$	z_1
-54.20	0.0435
-75.60	0.0651
-117.00	0.1081
-143.00	0.1508
-156.00	0.1932
-160.00	0.2143
-163.00	0.2353
-159.00	0.2562
-163.00	0.2771
-153.00	0.2979
-151.00	0.2979
-151.00	0.3186
-139.00	0.3598
-136.00	0.3598
-118.00	0.4007
-95.80	0.4414
-68.80	0.4817
-42.20	0.5218
-16.60	0.5616
-14.70	0.5616
13.10	0.6011
39.20	0.6403
45.90	0.6403
79.20	0.6793
132.00	0.7564
166.00	0.7946
183.00	0.8325
195.00	0.8514
204.00	0.8702
206.00	0.8889
210.00	0.9076
210.00	0.9262
195.00	0.9447
166.00	0.9632
108.00	0.9816

Cordray, D.R. - Izatt, R.M. - Christensen, J.J. - Oscarson, J.L., The excess enthalpies of (carbon dioxide + ethanol) at 308.15, 325.15, 373.15, 413.15, and 473.15 K from 5.00 to 14.91 MPa, The Journal of Chemical Thermodynamics. 20 (1988) 655-663. doi:10.1016/0021-9614(88)90016-X

T / K = 373.15

P / bar = 125.00

SA-HA systems (BAC = 8)

$h^M / \text{J.mol}^{-1}$	z_1		
-101.00	0.0449	1180.0	0.1490
-171.00	0.0672	1420.0	0.1701
-248.00	0.1114	1710.0	0.1910
-346.00	0.1552	2070.0	0.2119
-454.00	0.1985	2490.0	0.2328
-420.00	0.1985	4210.0	0.3155
-474.00	0.2414	5240.0	0.3566
-473.00	0.2414	6530.0	0.4176
-542.00	0.2839	6710.0	0.4379
-577.00	0.3259	7050.0	0.4581
-615.00	0.3676	7110.0	0.4782
-647.00	0.4088	7280.0	0.4982
-673.00	0.4496	7350.0	0.5182
-667.00	0.4496	7310.0	0.5382
-657.00	0.4496	7400.0	0.5581
-631.00	0.4901	7410.0	0.5581
-454.00	0.5301	7100.0	0.5977
-309.00	0.5698	6680.0	0.6370
-170.00	0.6091	6200.0	0.6762
-11.20	0.6480	5020.0	0.7538
127.00	0.6865	4290.0	0.7923
331.00	0.7247	3620.0	0.8305
478.00	0.7625	2880.0	0.8686
633.00	0.8000	2080.0	0.9064
687.00	0.8186	1290.0	0.9440
762.00	0.8371	861.00	0.9627

Critical point

Gurdial, Gurdev S. - Foster, Neil R. - Yun, S. L. Jimmy - Tilly, Kevin D., Phase Behavior of Supercritical Fluid—Entrainers Systems, *Supercritical Fluid Engineering Science*. 514 (1992) 34-45.

T / K	P / bar	x_1
305.80	76.50	0.9905
308.40	78.30	0.9786
310.30	80.70	0.9722
312.10	82.50	0.9634
315.20	86.10	0.9536
320.10	91.90	0.9362
325.10	97.40	0.9268

Cordray, D.R. - Izatt, R.M. - Christensen, J.J. - Oscarson, J.L., The excess enthalpies of (carbon dioxide + ethanol) at 308.15, 325.15, 373.15, 413.15, and 473.15 K from 5.00 to 14.91 MPa, *The Journal of Chemical Thermodynamics*. 20 (1988) 655-663. doi:10.1016/0021-9614(88)90016-X

T / K = 473.15

P / bar = 100.00

$h^M / \text{J.mol}^{-1}$	z_1
431.00	0.0643
440.00	0.0643
798.00	0.1068

Yeo, Sang-Do - Park, Su-Jin - Kim, Jin-Woo - Kim, Jae-Chang, Critical Properties of Carbon Dioxide + Methanol, + Ethanol, + 1-Propanol, and + 1-Butanol, *Journal of Chemical & Engineering Data*. 45 (2000) 932-935. doi:10.1021/je000104p

T / K	P / bar	x_1
310.58	77.73	0.9560
318.24	86.35	0.9380

SA-HA systems (BAC = 8)

328.36	100.89	0.8630	413.32	149.29	0.6001
350.62	128.04	0.7690	428.65	144.39	0.5505
377.17	146.30	0.6970	436.22	140.86	0.5002
393.08	151.54	0.6460	451.14	133.90	0.4496
410.32	151.67	0.5970	458.40	125.78	0.3999

Sun, M. - Ye, R. - Liu, T. - Liu, H., Measurements of the Critical Temperature and Pressure of Ethylene+ Benzene+ Ethylbenzene Mixture, Chin. J. Chem. Eng. 10 (2002) 469-472.

T / K	P / bar	x ₁
311.72	80.75	0.9669
332.80	106.50	0.8562
332.91	108.05	0.8323
347.45	123.65	0.7980

474.58	110.56	0.3000
480.48	105.09	0.2504
486.84	95.79	0.1998
493.23	90.52	0.1500
501.54	80.64	0.1000
507.29	73.09	0.0500

Wu, Weize - Ke, Jie - Poliakov, Martyn, Phase Boundaries of CO₂ + Toluene, CO₂ + Acetone, and CO₂ + Ethanol at High Temperatures and High Pressures, Journal of Chemical & Engineering Data. 51 (2006) 1398-1403. doi:10.1021/je060099a

T / K	P / bar	x ₁
383.20	147.20	0.7000
493.00	88.70	0.2000

Galicia-Luna, Luis A. - Ortega-Rodriguez, A. - Richon, D., New Apparatus for the Fast Determination of High-Pressure Vapor-Liquid Equilibria of Mixtures and of Accurate Critical Pressures, Journal of Chemical & Engineering Data. 45 (2000) 265-271. doi:10.1021/je990187d

T / K	P / bar	x ₁
312.82	81.54	0.9669
333.75	107.60	0.8562
333.82	108.78	0.8323

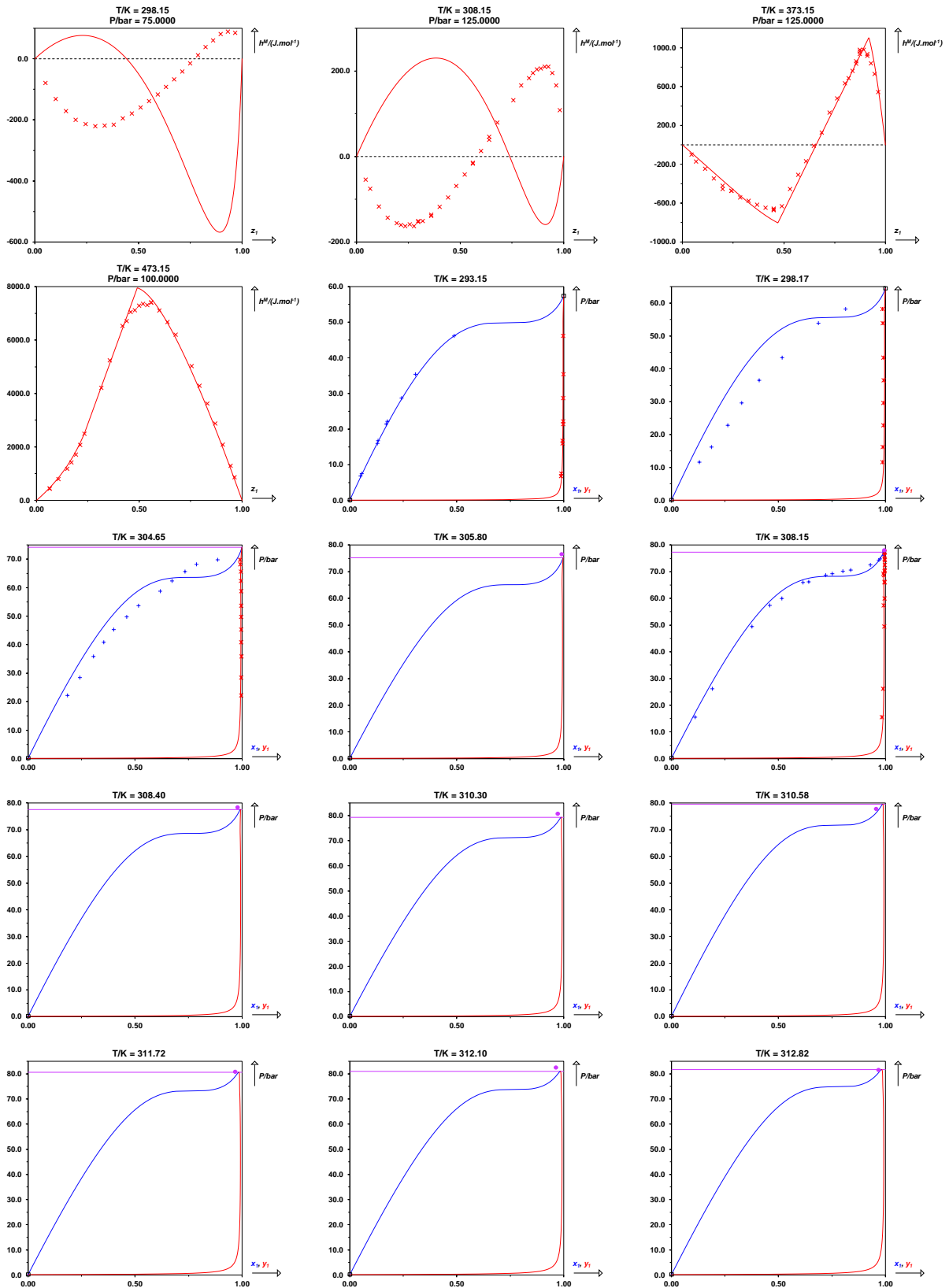
Joung, Seung Nam - Yoo, Chang Woo - Shin, Hun Yong - Kim, Sun Young - Yoo, Ki-Pung - Lee, Chul Soo - Huh, Wan Soo, Measurements and correlation of high-pressure VLE of binary CO₂-alcohol systems (methanol, ethanol, 2-methoxyethanol and 2-ethoxyethanol), Fluid Phase Equilibria. 185 (2001) 219-230. doi:10.1016/S0378-3812(01)00472-1

T / K	P / bar	x ₁
313.40	81.60	0.9630
338.80	113.10	0.8601

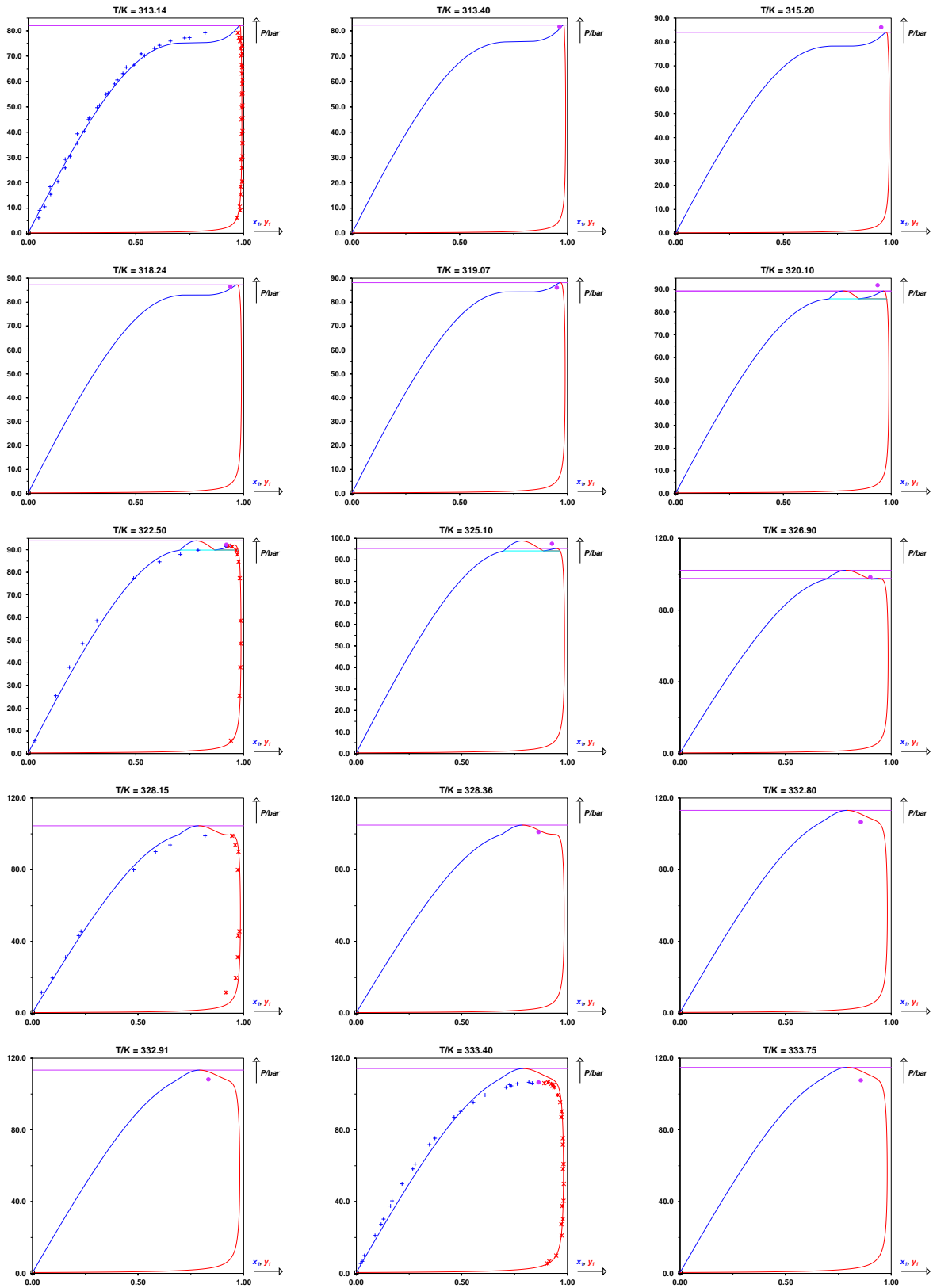
Gil, Laura - Blanco, Sofía T. - Rivas, Clara - Laga, Eduardo - Fernández, Javier - Artal, Manuela - Velasco, Inmaculada, Experimental determination of the critical loci for {n-C₆H₁₄ or CO₂+alkan-1-ol} mixtures. Evaluation of their critical and subcritical behavior using PC-SAFT EoS, The Journal of Supercritical Fluids. 71 (2012) 26-44. doi:10.1016/j.supflu.2012.07.008

T / K	P / bar	x ₁
319.07	86.05	0.9501
326.90	98.17	0.9000
336.96	110.88	0.8504
348.47	124.29	0.8002
368.18	138.42	0.7506
374.38	144.00	0.7199
400.57	150.77	0.6504

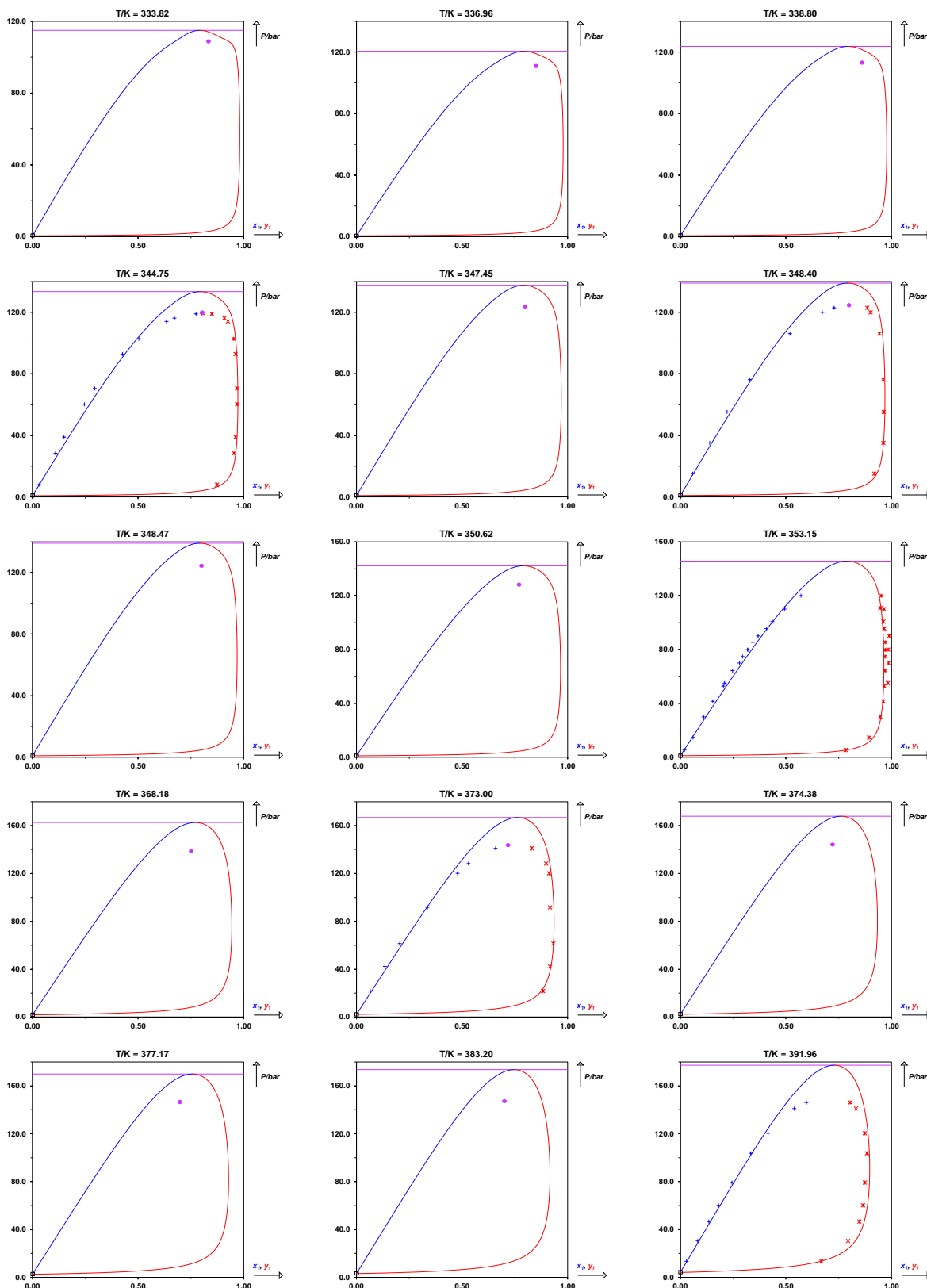
SA-HA systems (BAC = 8)



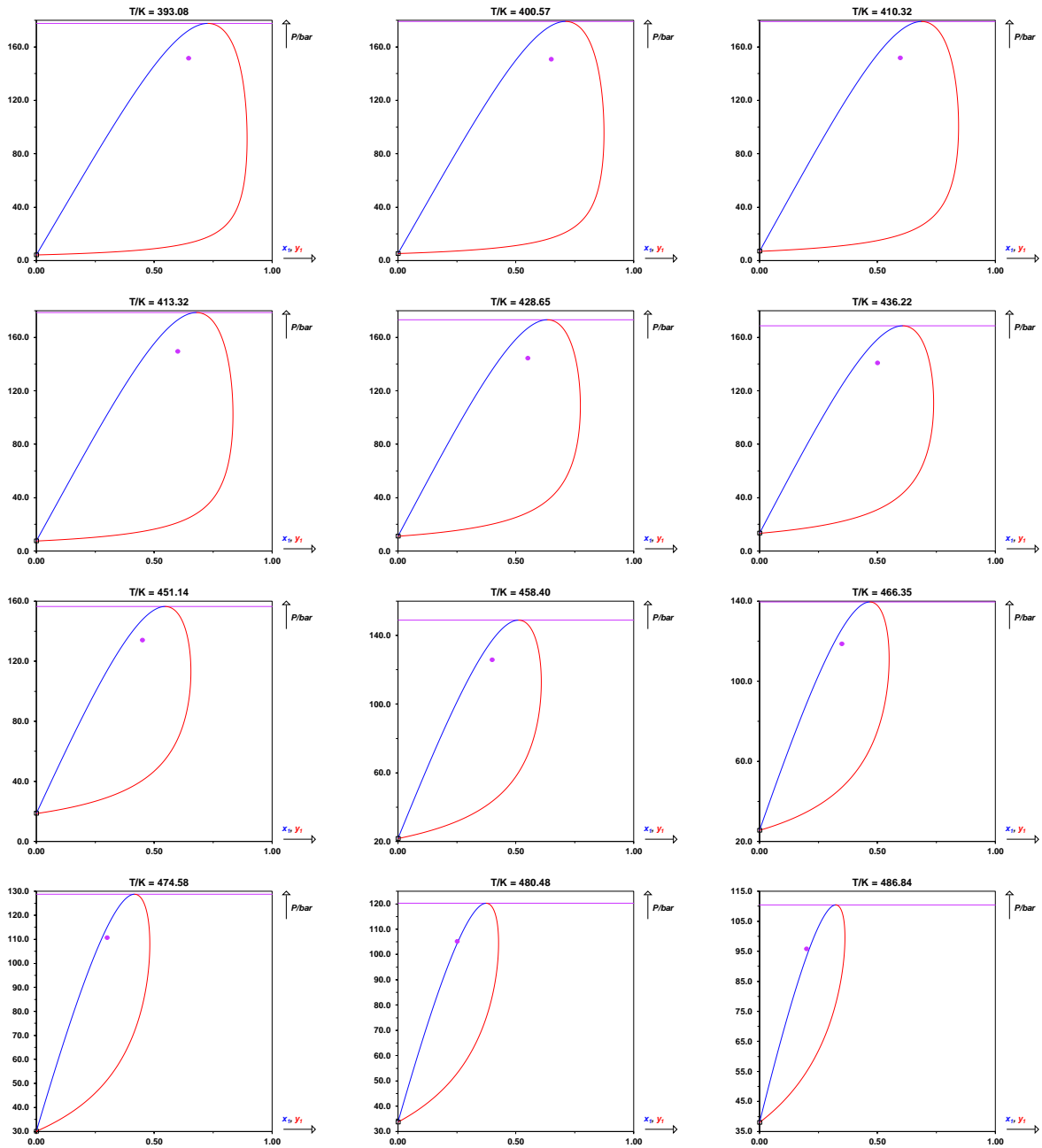
SA-HA systems (BAC = 8)



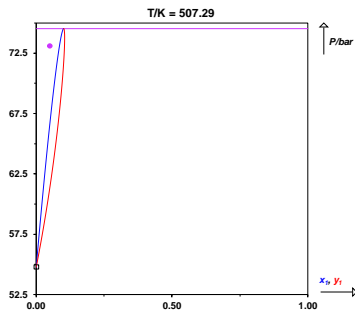
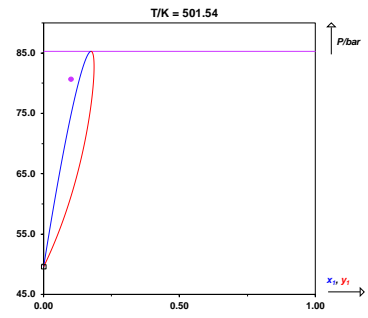
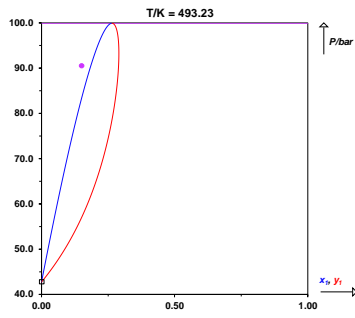
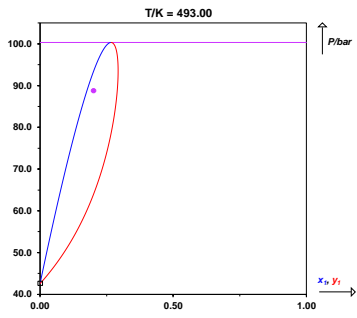
SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



ETHANOL (1) + ACETONE (2)

CAS	64-17-5	67-64-1
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	CSCPPACGZOO CGX-UHFFFAOYSA-N
T_c / K	514.00	508.20
P_c / bar	61.37	47.01
ω	0.644	0.307

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 59.49$

$B/\text{MPa} = 128.5$

Deviations

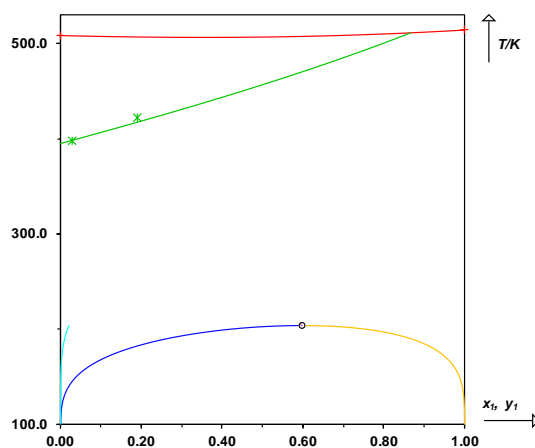
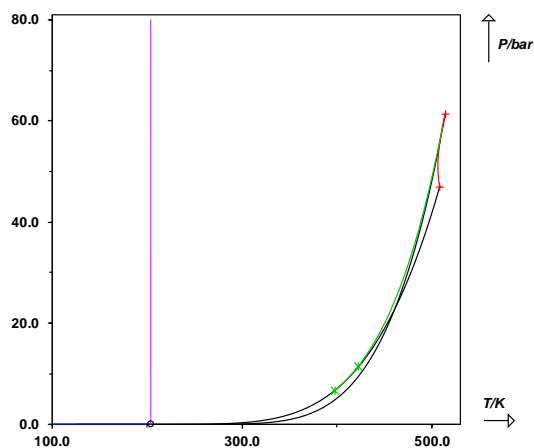
MAPE on $x = 10\%$

MAPE on $y = 9.1\%$

MAPE on $x_{\text{az}} = 8.4\%$

MAPE on $P_{\text{az}} = 1.1\%$

MAPE on $h^M = 15\%$



Isothermal phase equilibrium data

Vinichenko, I.G. - Susarev, M.P., Study and calculation of the liquid-vapor equilibrium in the acetone-ethanol-hexane system, J. Appl. Chem. USSR. 39 (1966) 1475-1478.

T / K = 328.15

P / bar	x ₁	y ₁
0.4602	0.9380	0.7830
0.5249	0.8750	0.6610
0.6236	0.7500	0.4960
0.7173	0.6250	0.3810
0.7746	0.5000	0.2880
0.8418	0.3750	0.2090
0.8921	0.2500	0.1470
0.9369	0.1250	0.0720

Lee, M.-J - Hu, C.-H, Isothermal vapor-liquid equilibria for mixtures of ethanol, acetone, and diisopropyl ether, Fluid Phase Equilibria. 109 (1995) 83-98. doi:10.1016/0378-3812(95)02705-J

T / K = 344.19

P / bar	x ₁	y ₁
0.9460	0.9050	0.7440
1.063	0.8090	0.5890
1.188	0.7070	0.4760
1.300	0.6120	0.3970
1.381	0.5110	0.3270
1.441	0.4080	0.2630
1.504	0.3050	0.2030
1.570	0.2050	0.1460
1.614	0.1100	0.0830

Lee, M.-J - Hu, C.-H, Isothermal vapor-liquid equilibria for mixtures of ethanol, acetone, and diisopropyl ether, Fluid Phase Equilibria. 109 (1995) 83-98. doi:10.1016/0378-3812(95)02705-J

T / K = 353.18

P / bar	x ₁	y ₁
1.312	0.9056	0.7650
1.475	0.8100	0.6160
1.614	0.7080	0.5030
1.750	0.6130	0.4230
1.847	0.5110	0.3490
1.909	0.4090	0.2850
2.006	0.3050	0.2180
2.063	0.2040	0.1550
2.118	0.1100	0.0870

Lee, M.-J - Hu, C.-H, Isothermal vapor-liquid equilibria for mixtures of ethanol, acetone, and diisopropyl ether, Fluid

Phase Equilibria. 109 (1995) 83-98. doi:10.1016/0378-3812(95)02705-J

T / K = 363.19

P / bar	x ₁	y ₁
1.943	0.9058	0.7540
2.179	0.8100	0.6260
2.329	0.7080	0.5340
2.446	0.6130	0.4630
2.550	0.5110	0.3910
2.652	0.4090	0.3200
2.728	0.3050	0.2470
2.785	0.2050	0.1720
2.829	0.1110	0.0980

Campbell, Scott W. - Wilsak, Richard A. - Thodos, George, Vapor-liquid equilibrium measurements for the ethanol-acetone system at 372.7, 397.7, and 422.6 K, Journal of Chemical & Engineering Data. 32 (1987) 357-362. doi:10.1021/je00049a021

T / K = 372.70

P / bar	x ₁	y ₁
2.586	0.8840	0.7730
2.772	0.7960	0.6690
2.975	0.6990	0.5640
3.158	0.5850	0.4650
3.327	0.4700	0.3770
3.451	0.3550	0.2820
3.547	0.2390	0.1980
3.613	0.1290	0.1150
3.640	0.0760	0.0660

Campbell, Scott W. - Wilsak, Richard A. - Thodos, George, Vapor-liquid equilibrium measurements for the ethanol-acetone system at 372.7, 397.7, and 422.6 K, Journal of Chemical & Engineering Data. 32 (1987) 357-362. doi:10.1021/je00049a021

T / K = 397.70

P / bar	x ₁	y ₁	
5.219	0.9220	0.8770	
5.574	0.8300	0.7440	
5.898	0.7180	0.6160	
6.123	0.6000	0.5360	
6.302	0.5090	0.4540	
6.405	0.4530	0.3950	
6.529	0.3420	0.3050	
6.615	0.2330	0.2110	
6.664	0.1440	0.1300	
6.681	0.0760	0.0690	
6.688	0.0300	0.0300	AZEO
6.660	0.0210	0.0230	

Campbell, Scott W. - Wilsak, Richard A. - Thodos, George, Vapor-liquid equilibrium measurements for the ethanol-acetone system at 372.7, 397.7, and 422.6 K, Journal of Chemical & Engineering Data. 32 (1987) 357-362. doi:10.1021/je00049a021

T / K = 422.60			
P / bar	x_1	y_1	
10.01	0.9240	0.8910	
10.47	0.8010	0.7580	
10.75	0.6960	0.6590	
11.02	0.5870	0.5530	
11.19	0.4760	0.4490	
11.30	0.3760	0.3610	
11.34	0.2710	0.2640	
11.36	0.1900	0.1900	AZEO
11.35	0.1760	0.1770	
11.32	0.1090	0.1160	

Isobaric phase equilibrium data

Ku, Hsu-Chen - Tu, Chein-Hsiun, Isobaric vapor-liquid equilibria for mixtures of acetone, ethanol, and 2,2,4-trimethylpentane at 101.3kPa, Fluid Phase Equilibria. 231 (2005) 99-108. doi:10.1016/j.fluid.2005.01.007

P / bar = 1.013			
T / K	x_1	y_1	
348.91	0.9560	0.8710	
346.65	0.9150	0.7680	
344.53	0.8680	0.6750	
342.69	0.8250	0.5970	
341.17	0.7730	0.5370	
339.81	0.7240	0.4830	
338.39	0.6720	0.4290	
337.32	0.6200	0.3910	
336.24	0.5670	0.3490	
335.37	0.5190	0.3150	
334.51	0.4620	0.2810	
333.78	0.4140	0.2510	
333.06	0.3610	0.2230	
332.43	0.3120	0.1970	
331.81	0.2550	0.1650	
331.20	0.2040	0.1330	
330.66	0.1510	0.1020	
330.17	0.0990	0.0710	
329.69	0.0490	0.0350	

Enthalpy of mixing

Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033

T / K = 283.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$	z_1
198.10	0.9500
376.30	0.8980
525.40	0.8500
667.00	0.7970
782.50	0.7460
872.70	0.6940
938.20	0.6470
999.00	0.5920
1038.7	0.5410
1043.7	0.4900
1040.7	0.4430
1019.6	0.3970
975.70	0.3440
910.40	0.2950
835.40	0.2530
702.20	0.1950
586.60	0.1520
401.20	0.0950
225.30	0.0500

Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033

T / K = 298.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$	z_1
210.30	0.9500
396.40	0.8980
561.10	0.8500
712.00	0.7970
826.90	0.7460
926.00	0.6940
995.70	0.6470
1052.2	0.5920
1096.8	0.5410
1101.3	0.4900

SA-HA systems (BAC = 8)

1095.5	0.4430	1069.7	0.2950
1069.5	0.3970	972.70	0.2530
1020.3	0.3440	806.00	0.1950
945.30	0.2950	662.60	0.1520
860.20	0.2530	439.20	0.0950
712.70	0.1950		
582.90	0.1520		
385.00	0.0950		
213.20	0.0500		

Shen, S. - Wang, Y. - Shi, J., Determination of Excess Enthalpies and the Prediction of Vapor - Liquid Equilibria for Some Ketone Alcohol Systems, Gaoxiao Huaxue Gongcheng Xuebao. 4 (1990) 1-7.

T / K = 308.16
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
313.70	0.9303
625.60	0.8525
772.30	0.8085
991.40	0.7249
1114.2	0.6426
1151.2	0.5994
1181.6	0.5418
1173.1	0.4361
1068.0	0.3296
827.00	0.2067
450.10	0.0983
346.50	0.0743

Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033

T / K = 323.15
P / bar = 4.000

$h^M / \text{J.mol}^{-1}$	z_1
479.10	0.8980
666.40	0.8500
834.50	0.7970
976.60	0.7460
1076.7	0.6940
1160.3	0.6470
1223.4	0.5920
1269.2	0.5410
1269.1	0.4900
1256.0	0.4430
1219.0	0.3970
1161.2	0.3440

Lien, Pei-Jung - Lin, Ho-mu - Lee, Ming-Jer, Excess Molar Enthalpies for Binary Mixtures of Ethanol + Acetone, + Octane, + Cyclohexane and 1-Propanol + Acetone, + Octane, + Heptane at 323.15 K, Journal of Chemical & Engineering Data. 48 (2003) 359-361.

doi:10.1021/je020149l

T / K = 323.15

P / bar = 1.013

$h^M / \text{J.mol}^{-1}$	z_1
255.00	0.0500
483.00	0.1020
652.00	0.1500
805.00	0.2000
928.00	0.2520
1018.0	0.3000
1085.0	0.3520
1124.0	0.4000
1144.0	0.4520
1139.0	0.5010
1109.0	0.5510
1066.0	0.6000
1005.0	0.6500
919.00	0.7020
818.00	0.7520
701.00	0.8000
560.00	0.8500
392.00	0.9010
211.00	0.9500

Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033

T / K = 343.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$	z_1
496.40	0.8980
686.10	0.8500
862.00	0.7970
1010.5	0.7460
1114.1	0.6940
1199.5	0.6470
1262.5	0.5920

1309.3	0.5410
1309.4	0.4900
1283.6	0.4430
1242.6	0.3970
1172.7	0.3440
1073.9	0.2950
964.10	0.2530
791.20	0.1950
653.20	0.1520
426.20	0.0950

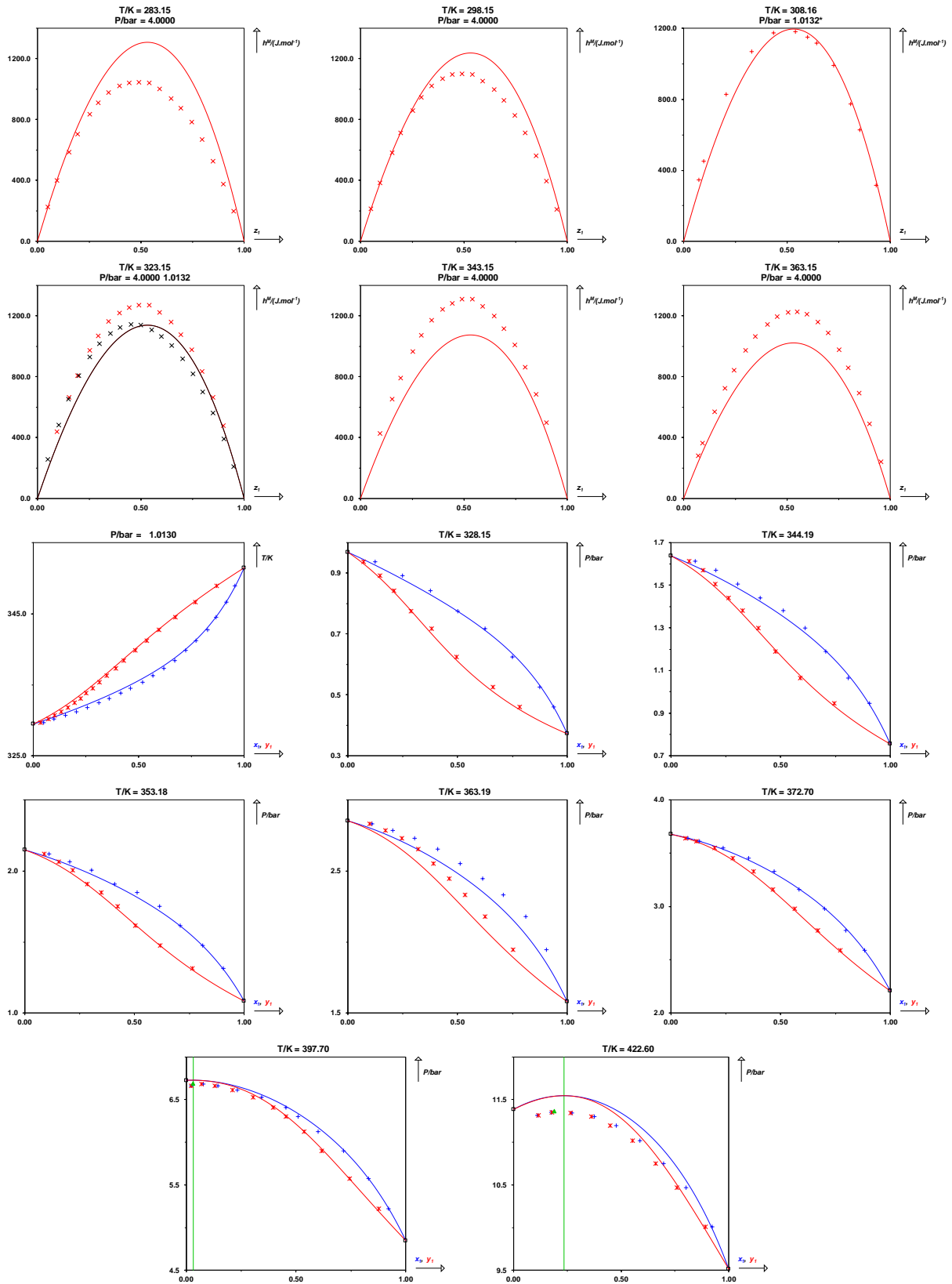
Lietzmann, Andreas - Loewen, Burkhard - Schulz, Siegfried, Excess Molar Enthalpies of Propanone + Heptane, Propanone + Ethanol, Ethanol + Heptane, and 2-Propanol + Water at 283.15, 298.15, 323.15, 343.15, and 363.15 K, Journal of Chemical & Engineering Data. 39 (1994) 785-788. doi:10.1021/je00016a033

T / K = 363.15

P / bar = 4.000

$h^M / \text{J.mol}^{-1}$	z_1
241.20	0.9540
491.30	0.9000
693.40	0.8490
859.90	0.7950
978.20	0.7510
1089.7	0.6980
1160.9	0.6500
1209.0	0.5980
1226.2	0.5490
1222.3	0.5050
1193.1	0.4520
1144.8	0.4050
1063.5	0.3480
973.10	0.3000
841.60	0.2430
724.10	0.2010
568.90	0.1500
364.40	0.0910
280.10	0.0700

SA-HA systems (BAC = 8)



ETHANOL (1) + METHYL ETHYL KETONE (2)

CAS	64-17-5	78-93-3
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	ZWEHNKRNPQVVGH-UHFFFAOYSA-N
T_c / K	514.00	535.50
P_c / bar	61.37	41.50
ω	0.644	0.323

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 64.22$$

$$B/\text{MPa} = 102.1$$

Deviations

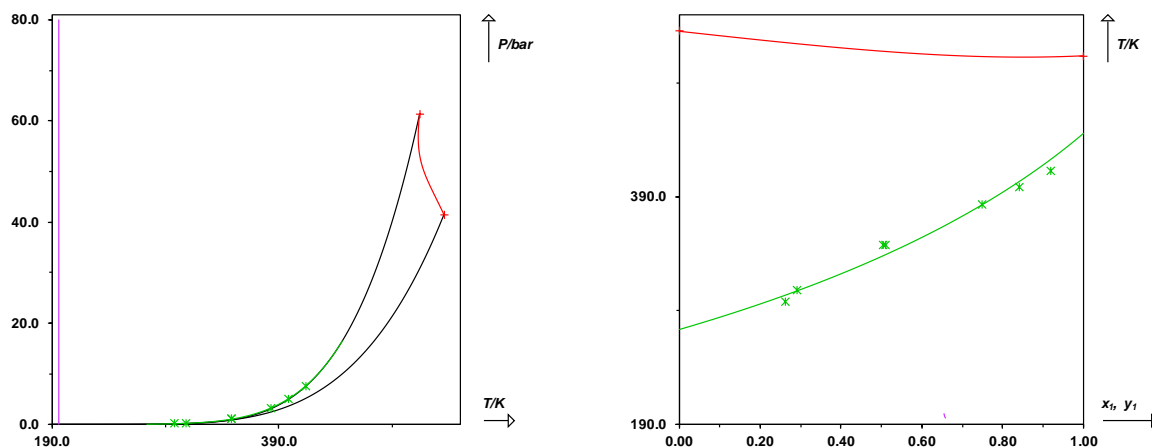
$$\text{MAPE on } x = 10\%$$

$$\text{MAPE on } y = 7.8\%$$

$$\text{MAPE on } x_{\text{az}} = 9.6\%$$

$$\text{MAPE on } P_{\text{az}} = 1.2\%$$

$$\text{MAPE on } h^M = 14\%$$



-----				4.339	0.2440	0.3580	
Isothermal phase equilibrium data				4.574	0.3580	0.4700	
-----				4.833	0.5370	0.6070	
Ohta, Tatsuhiko - Koyabu, Jitsuo - Nagata, Isamu, Vapor— liquid equilibria for the ternary Ethanol—2-butanone— benzene system at 298.15 K, Fluid Phase Equilibria. 7 (1981) 65-73. doi:10.1016/0378-3812(81)87006-9				4.884	0.5880	0.6510	
T / K = 298.15				4.993	0.7490	0.7680	
P / bar	x ₁	y ₁		5.014	0.8400	0.8400	AZEO
0.1263	0.0730	0.0970		5.014	0.8420	0.8430	
0.1280	0.1380	0.1650		Narasigadu, Caleb - Naidoo, Paramespri - Coquelet, Christophe - Richon, Dominique - Ramjugernath, Deresh, Isothermal Vapor—Liquid Equilibrium Data for the Butan- 2-one + Methanol or Ethanol Systems Using a Static- Analytic Microcell, Journal of Chemical & Engineering Data. 58 (2013) 1280-1287. doi:10.1021/je400065j			
0.1304	0.2610	0.2610	AZEO	T / K = 413.20			
0.1305	0.2730	0.2680		P / bar	x ₁	y ₁	
0.1285	0.3280	0.3020		5.726	0.1220	0.2070	
0.1268	0.4820	0.3800		6.077	0.2080	0.3200	
0.1257	0.5050	0.3980		6.395	0.2950	0.4190	
0.1240	0.5700	0.4320		6.627	0.3700	0.4910	
0.1188	0.6590	0.4860		6.957	0.4920	0.5920	
0.1100	0.7700	0.5830		7.102	0.5540	0.6400	
0.1047	0.8390	0.6580		7.267	0.6410	0.7030	
0.0960	0.9180	0.7780		7.407	0.7180	0.7590	
0.0924	0.9390	0.8140		7.538	0.8350	0.8430	
Narasigadu, Caleb - Naidoo, Paramespri - Coquelet, Christophe - Richon, Dominique - Ramjugernath, Deresh, Isothermal Vapor—Liquid Equilibrium Data for the Butan- 2-one + Methanol or Ethanol Systems Using a Static- Analytic Microcell, Journal of Chemical & Engineering Data. 58 (2013) 1280-1287. doi:10.1021/je400065j				7.569	0.9000	0.9030	
T / K = 383.30				7.587	0.9160	0.9190	
P / bar	x ₁	y ₁		7.587	0.9200	0.9200	AZEO
2.716	0.1110	0.1870		-----			
2.798	0.1600	0.2440		Isobaric phase equilibrium data			
2.903	0.2310	0.3280		-----			
2.979	0.2900	0.3930		Martínez, Nelson F. - Lladosa, Estela - Burguet, MaCruz - Montón, Juan B., Isobaric vapour—liquid equilibria for binary systems of 2-butanone with ethanol, 1-propanol, and 2-propanol at 20 and 101.3 kPa, Fluid Phase Equilibria. 270 (2008) 62-68. doi:10.1016/j.fluid.2008.06.004			
3.045	0.3580	0.4500		P / bar = 0.2000			
3.140	0.4650	0.5270		T / K	x ₁	y ₁	
3.218	0.6450	0.6700		308.94	0.0360	0.0620	
3.231	0.7500	0.7500	AZEO	308.41	0.0920	0.1320	
3.231	0.7550	0.7520		308.00	0.1470	0.1870	
3.220	0.8580	0.8420		307.87	0.2070	0.2340	
Narasigadu, Caleb - Naidoo, Paramespri - Coquelet, Christophe - Richon, Dominique - Ramjugernath, Deresh, Isothermal Vapor—Liquid Equilibrium Data for the Butan- 2-one + Methanol or Ethanol Systems Using a Static- Analytic Microcell, Journal of Chemical & Engineering Data. 58 (2013) 1280-1287. doi:10.1021/je400065j				307.73	0.2630	0.2740	
T / K = 398.20				307.60	0.2920	0.2920	AZEO
P / bar	x ₁	y ₁		307.64	0.3220	0.3110	
4.056	0.1350	0.2210		307.70	0.3720	0.3420	
4.235	0.2020	0.3040		307.82	0.4270	0.3760	
				308.12	0.4770	0.4050	
				308.29	0.5280	0.4360	

SA-HA systems (BAC = 8)

308.50	0.5790	0.4670	348.10	0.2960	0.3600
308.82	0.6300	0.4990	347.87	0.3450	0.3960
309.23	0.6800	0.5380	347.66	0.3920	0.4300
309.69	0.7330	0.5800	347.54	0.4460	0.4670
310.30	0.7920	0.6340	347.50	0.5010	0.5060
311.00	0.8320	0.6870	347.50	0.5100	0.5100
311.87	0.8790	0.7440	347.51	0.5590	0.5450
312.87	0.9220	0.8090	347.58	0.6080	0.5820
313.91	0.9540	0.8820	347.72	0.6570	0.6170

Wen, Chao-Cheng - Tu, Chein-Hsiun, Vapor-liquid equilibria for binary and ternary mixtures of ethanol, 2-butanone, and 2,2,4-trimethylpentane at 101.3kPa, Fluid Phase Equilibria. 258 (2007) 131-139. doi:10.1016/j.fluid.2007.06.005

P / bar = 1.013

T / K x_1 y_1

351.69 0.0360 0.0600

351.00 0.0700 0.1120

350.36 0.1060 0.1610

349.71 0.1420 0.2050

348.90 0.1970 0.2700

348.32 0.2580 0.3320

347.95 0.3050 0.3680

347.69 0.3740 0.4200

347.55 0.4320 0.4540

347.48 0.4910 0.4950

347.46 0.5040 0.5040 AZEO

347.50 0.5430 0.5340

347.56 0.5970 0.5650

347.70 0.6440 0.6040

347.91 0.6950 0.6420

348.21 0.7520 0.6920

348.58 0.7870 0.7290

349.06 0.8420 0.7810

349.70 0.8980 0.8410

350.45 0.9580 0.9140

Martínez, Nelson F. - Lladosa, Estela - Burguet, MaCruz - Montón, Juan B., Isobaric vapour-liquid equilibria for binary systems of 2-butanone with ethanol, 1-propanol, and 2-propanol at 20 and 101.3 kPa, Fluid Phase Equilibria. 270 (2008) 62-68. doi:10.1016/j.fluid.2008.06.004

P / bar = 1.013

T / K x_1 y_1

351.34 0.0400 0.0830

350.44 0.0870 0.1480

349.68 0.1400 0.2150

348.99 0.1990 0.2660

348.56 0.2450 0.3120

348.29 0.7640 0.7000
 348.73 0.8210 0.7550
 349.19 0.8660 0.8020
 349.78 0.9120 0.8590
 350.53 0.9570 0.9260

Enthalpy of mixing

Chao, Jian-Ping - Dai, Ming, Studies of thermodynamic properties of binary mixtures containing an alcohol, Thermochemica Acta. 179 (1991) 257-264. doi:10.1016/0040-6031(91)80355-M

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

133.90 0.0311

234.50 0.0564

321.20 0.0814

411.30 0.1058

493.20 0.1300

569.20 0.1525

711.20 0.1995

808.60 0.2440

894.20 0.2870

961.90 0.3286

1013.4 0.3689

1047.2 0.4079

1069.8 0.4457

1080.8 0.4823

1075.5 0.5178

1062.8 0.5523

1029.8 0.6021

980.50 0.6498

911.40 0.6955

830.10 0.7393

739.50 0.7812

630.20 0.8218

515.40 0.8607

391.90 0.8979

SA-HA systems (BAC = 8)

262.70 0.9341
127.10 0.9687

Iñarrea, J - Valero, J - Pérez, P - Gracia, M - Gutiérrez Losa, C, HmE and VmE of some (butanone or dipropylether + an alkanol) mixtures, The Journal of Chemical Thermodynamics. 20 (1988) 193-199. doi:10.1016/0021-9614(88)90154-1

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

357.00 0.0826

451.00 0.1096

610.00 0.1630

782.00 0.2340

892.00 0.2987

910.00 0.3141

955.00 0.3350

989.00 0.3766

1032.0 0.4509

1012.0 0.5429

985.00 0.5852

893.00 0.6808

734.00 0.7672

569.00 0.8363

420.00 0.8871

342.00 0.9057

Nagata, Isamu - Ohta, Tatsuhiko - Nakagawa, Shigeo, Excess Gibbs Free Energies And Heats Of Mixing For Binary Alcoholic Liquid Mixtures, Journal of Chemical Engineering of Japan. 9 (1976) 276-281. doi:10.1252/jcej.9.276

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

465.99 0.0966

479.39 0.1005

504.51 0.1074

646.86 0.1541

776.65 0.2049

787.12 0.2083

960.87 0.2918

973.01 0.2999

1083.1 0.4112

1078.5 0.4956

1075.6 0.4989

999.81 0.5994

860.39 0.6963

866.67 0.7011

859.13 0.7033

655.65 0.8009

391.88 0.8965

Nagata, Isamu - Tago, Osamu - Takahashi, Takeshi, Heats of Mixing for Binary Methyl Ethyl Ketone, Methyl Acetate-Alcohol Systems, Chemical engineering. 34 (1970) 1107-1112,a1. doi:10.1252/kakoronbunshu1953.34.1107

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

539.50 0.1173

820.90 0.2171

1029.0 0.3145

1105.0 0.4056

1112.0 0.4558

1125.0 0.5049

1105.0 0.5528

1048.0 0.6127

909.60 0.7080

683.50 0.8076

392.00 0.9047

Iñarrea, J - Valero, J - Pérez, P - Gracia, M - Gutiérrez Losa, C, HmE and VmE of some (butanone or dipropylether + an alkanol) mixtures, The Journal of Chemical Thermodynamics. 20 (1988) 193-199. doi:10.1016/0021-9614(88)90154-1

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / J.mol^{-1}$ x_1

378.00 0.0825

528.00 0.1232

741.00 0.1912

887.00 0.2604

1076.0 0.4637

1068.0 0.5260

1070.0 0.5318

1056.0 0.5567

1041.0 0.5830

892.00 0.7089

661.00 0.8065

261.00 0.9381

Pikkarainen, Liisa, Excess enthalpies of binary solvent mixtures of 2-butanone with aliphatic alcohols, Thermochemica Acta. 114 (1987) 239-244. doi:10.1016/0040-6031(87)80044-8

T / K = 313.15

P / bar = UNKNOWN (1.0132)

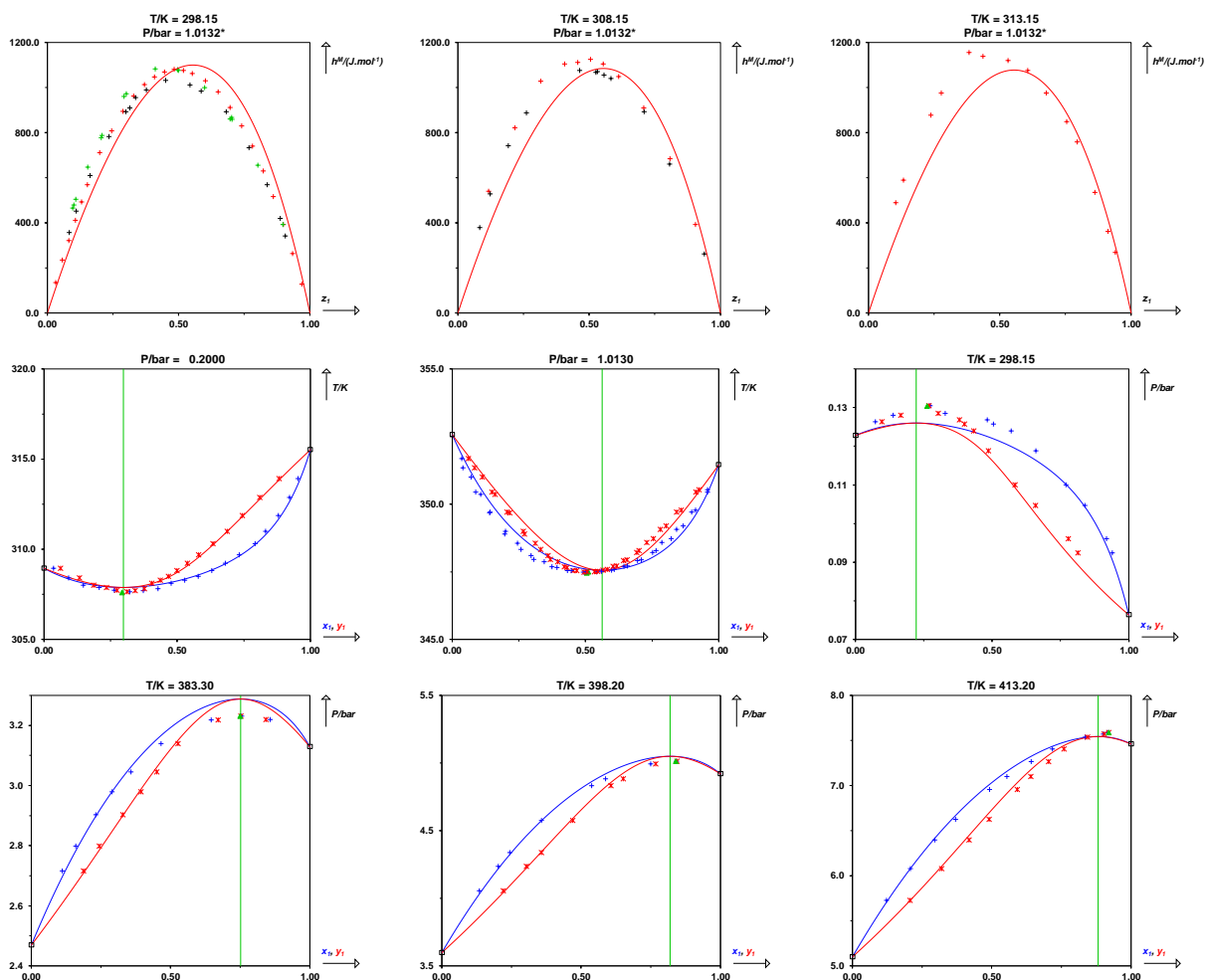
$h^M / J.mol^{-1}$ x_1

489.00 0.1030

SA-HA systems (BAC = 8)

589.00	0.1333
877.00	0.2372
975.00	0.2762
1155.0	0.3833
1139.0	0.4356
1120.0	0.5316
1076.0	0.6064
976.00	0.6768
849.00	0.7548
758.00	0.7935
535.00	0.8618
362.00	0.9125
268.00	0.9395

SA-HA systems (BAC = 8)



DIETHYL ETHER (1) + ETHANOL (2)

CAS	60-29-7	64-17-5
InChiKey	RTZKZFDLAIYFH-UHFFFAOYSA-N	LFQSCWFLJHTTHZ-UHFFFAOYSA-N
T_c / K	466.70	514.00
P_c / bar	36.40	61.37
ω	0.281	0.644

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 92.39$$

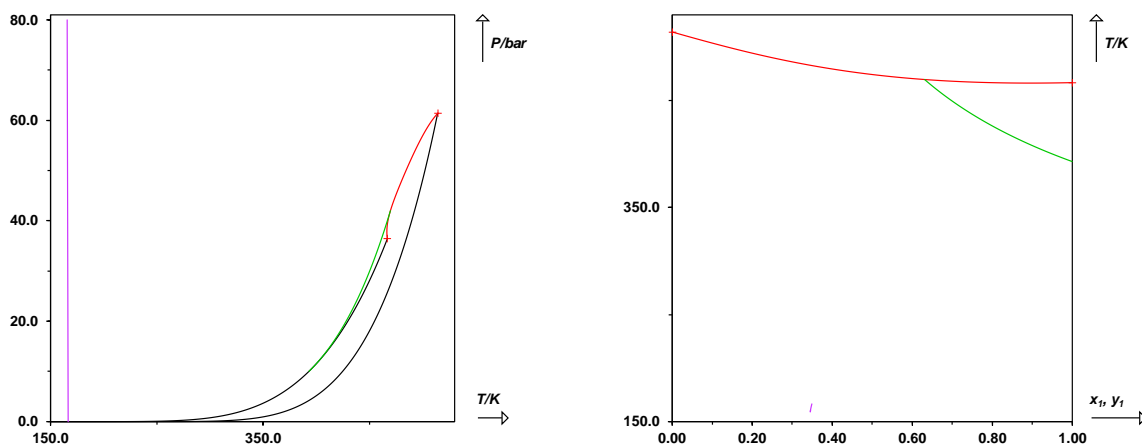
$$B/\text{MPa} = 42.06$$

Deviations

$$\text{MAPE on } x = 17\%$$

$$\text{MAPE on } y = 6.0\%$$

$$\text{MAPE on } h^M = 50\%$$



SA-HA systems (BAC = 8)

Isothermal phase equilibrium data

Nagai, J. - Isii, N., Volatility of fuels containing ethyl alcohol. I. Partial pressures of ethyl alcohol and ethyl ether in their mixtures and calculation of heat of mixture, J. Soc. Chem. Ind. Jpn. 38 (1935) 8B-12B.

T / K = 273.15		
P / bar	x ₁	y ₁
0.0491	0.0500	0.6787
0.0765	0.1000	0.8034
0.1018	0.1500	0.8590
0.1210	0.2000	0.8866
0.1370	0.2500	0.9039
0.1505	0.3000	0.9159
0.1621	0.3500	0.9259
0.1723	0.4000	0.9323
0.1818	0.4500	0.9386
0.1906	0.5000	0.9442
0.1980	0.5500	0.9487
0.2038	0.6000	0.9523
0.2086	0.6500	0.9555
0.2131	0.7000	0.9585
0.2178	0.7500	0.9622
0.2233	0.8000	0.9667
0.2293	0.8500	0.9720
0.2352	0.9000	0.9783
0.2412	0.9500	0.9861

Nagai, J. - Isii, N., Volatility of fuels containing ethyl alcohol. I. Partial pressures of ethyl alcohol and ethyl ether in their mixtures and calculation of heat of mixture, J. Soc. Chem. Ind. Jpn. 38 (1935) 8B-12B.

T / K = 283.15		
P / bar	x ₁	y ₁
0.0796	0.0500	0.6116
0.1241	0.1000	0.7636
0.1619	0.1500	0.8269
0.1901	0.2000	0.8593
0.2149	0.2500	0.8801
0.2360	0.3000	0.8953
0.2539	0.3500	0.9068
0.2703	0.4000	0.9161
0.2864	0.4500	0.9245
0.2994	0.5000	0.9311
0.3093	0.5500	0.9362
0.3178	0.6000	0.9404
0.3267	0.6500	0.9457
0.3359	0.7000	0.9501
0.3453	0.7500	0.9556
0.3546	0.8000	0.9613

0.3631	0.8500	0.9675
0.3716	0.9000	0.9745
0.3801	0.9500	0.9841

Nagai, J. - Isii, N., Volatility of fuels containing ethyl alcohol. I. Partial pressures of ethyl alcohol and ethyl ether in their mixtures and calculation of heat of mixture, J. Soc. Chem. Ind. Jpn. 38 (1935) 8B-12B.

T / K = 293.15		
P / bar	x ₁	y ₁
0.1305	0.0500	0.5681
0.1934	0.1000	0.7224
0.2460	0.1500	0.7918
0.2908	0.2000	0.8317
0.3288	0.2500	0.8575
0.3613	0.3000	0.8760
0.3883	0.3500	0.8893
0.4109	0.4000	0.8995
0.4312	0.4500	0.9082
0.4499	0.5000	0.9159
0.4673	0.5500	0.9230
0.4831	0.6000	0.9294
0.4975	0.6500	0.9353
0.5094	0.7000	0.9405
0.5213	0.7500	0.9461
0.5339	0.8000	0.9529
0.5477	0.8500	0.9610
0.5614	0.9000	0.9704
0.5753	0.9500	0.9821

Gordon, A.R. - Hornibrook, E.J., Liquid-Vapor Equilibrium for the System Ethanol - Diethyl - Ether, Can. J. Res. Sect. B. 24 (1946) 263-267.

T / K = 298.15		
P / bar	x ₁	y ₁
0.0880	0.0050	0.1105
0.0975	0.0100	0.1985
0.1156	0.0200	0.3305
0.1504	0.0400	0.4950
0.1831	0.0600	0.5940
0.2135	0.0800	0.6600
0.2417	0.1000	0.7070
0.3046	0.1500	0.7815
0.3584	0.2000	0.8245
0.4029	0.2500	0.8520
0.4409	0.3000	0.8700
0.4738	0.3500	0.8830
0.5014	0.4000	0.8930
0.5474	0.5000	0.9110
0.5852	0.6000	0.9250

SA-HA systems (BAC = 8)

0.6166	0.7000	0.9390	1.102	0.7500	0.9257
0.6469	0.8000	0.9560	1.129	0.8000	0.9357
0.6789	0.9000	0.9760	1.155	0.8500	0.9466
0.6962	0.9500	0.9880	1.180	0.9000	0.9598
			1.204	0.9500	0.9762

Nagai, J. - Isii, N., Volatility of fuels containing ethyl alcohol. I. Partial pressures of ethyl alcohol and ethyl ether in their mixtures and calculation of heat of mixture, J. Soc. Chem. Ind. Jpn. 38 (1935) 8B-12B.

T / K = 303.15		
P / bar	x ₁	y ₁
0.2053	0.0500	0.5092
0.2973	0.1000	0.6771
0.3720	0.1500	0.7538
0.4332	0.2000	0.7977
0.4866	0.2500	0.8278
0.5193	0.3000	0.8455
0.5720	0.3500	0.8656
0.6060	0.4000	0.8785
0.6373	0.4500	0.8897
0.6649	0.5000	0.8993
0.6896	0.5500	0.9077
0.7114	0.6000	0.9153
0.7310	0.6500	0.9223
0.7626	0.7000	0.9305
0.7700	0.7500	0.9371
0.7879	0.8000	0.9451
0.8063	0.8500	0.9540
0.8247	0.9000	0.9651
0.8433	0.9500	0.9789

Nagai, J. - Isii, N., Volatility of fuels containing ethyl alcohol. I. Partial pressures of ethyl alcohol and ethyl ether in their mixtures and calculation of heat of mixture, J. Soc. Chem. Ind. Jpn. 38 (1935) 8B-12B.

T / K = 313.15		
P / bar	x ₁	y ₁
0.3173	0.0500	0.4618
0.4404	0.1000	0.6303
0.5446	0.1500	0.7150
0.6309	0.2000	0.7650
0.7059	0.2500	0.7992
0.7693	0.3000	0.8234
0.8234	0.3500	0.8420
0.8715	0.4000	0.8571
0.9167	0.4500	0.8706
0.9567	0.5000	0.8820
0.9893	0.5500	0.8912
1.019	0.6000	0.8998
1.047	0.6500	0.9083
1.074	0.7000	0.9167

Nagai, J. - Isii, N., Volatility of fuels containing ethyl alcohol. I. Partial pressures of ethyl alcohol and ethyl ether in their mixtures and calculation of heat of mixture, J. Soc. Chem. Ind. Jpn. 38 (1935) 8B-12B.

T / K = 323.15		
P / bar	x ₁	y ₁
0.4853	0.0500	0.4203
0.6481	0.1000	0.5863
0.7794	0.1500	0.6723
0.8986	0.2000	0.7285
0.9983	0.2500	0.7666
1.084	0.3000	0.7946
1.158	0.3500	0.8161
1.226	0.4000	0.8341
1.290	0.4500	0.8496
1.342	0.5000	0.8621
1.388	0.5500	0.8732
1.428	0.6000	0.8835
1.468	0.6500	0.8939
1.504	0.7000	0.9040
1.543	0.7500	0.9148
1.578	0.8000	0.9268
1.612	0.8500	0.9396
1.644	0.9000	0.9543
1.674	0.9500	0.9727

Enthalpy of mixing

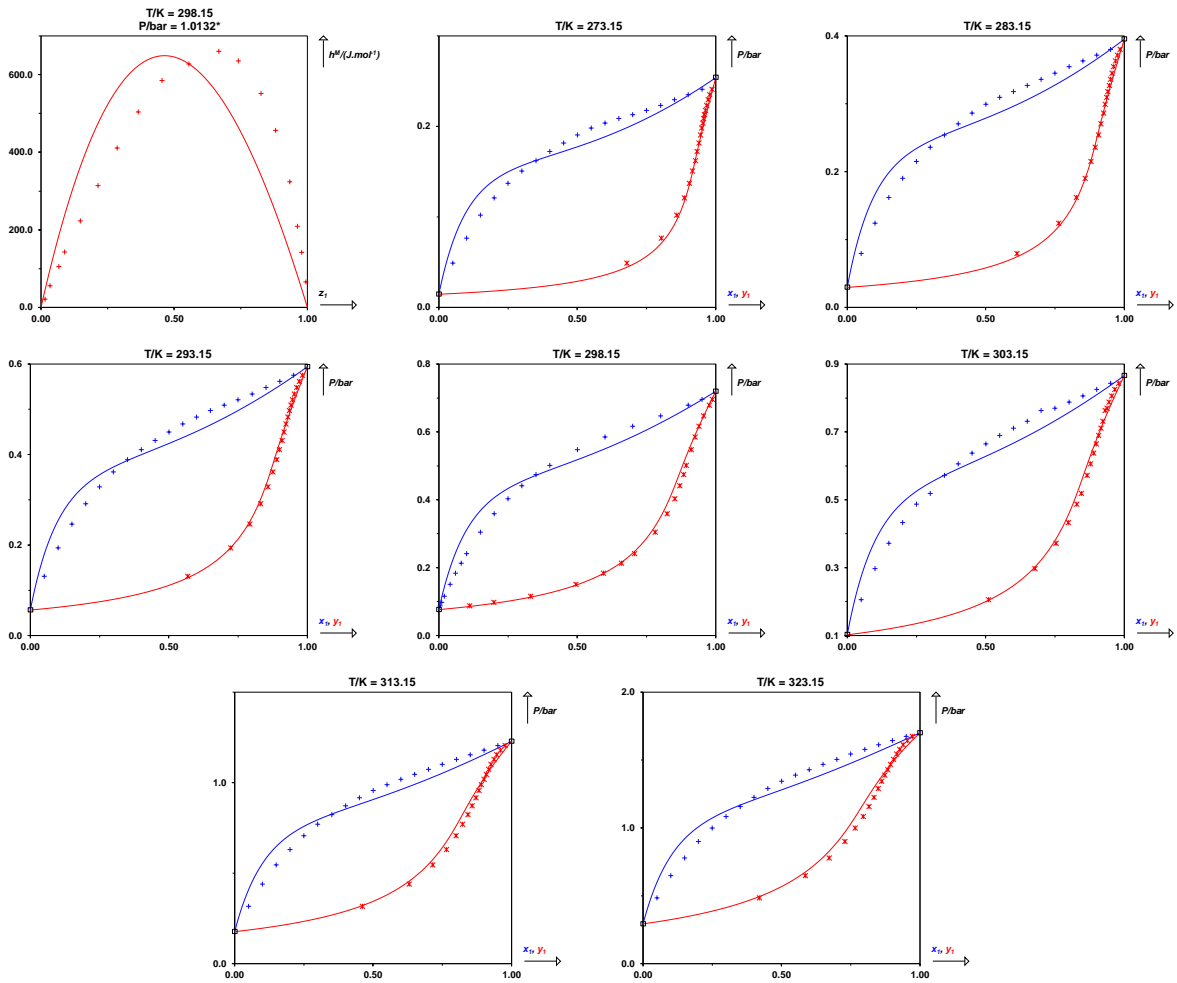
Villamañan, M.A. - Casanova, C. - Roux, A.H. - Grolier, J.-P.E., Calorimetric investigation of the interactions between oxygen and hydroxyl groups in (alcohol+ether) at 298.15 K, The Journal of Chemical Thermodynamics. 14 (1982) 251-258. doi:10.1016/0021-9614(82)90015-5

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
21.50	0.0146
55.70	0.0339
105.70	0.0673
143.10	0.0884
222.80	0.1479
313.60	0.2133
411.10	0.2853
503.80	0.3653

SA-HA systems (BAC = 8)

585.50	0.4545
627.90	0.5547
660.70	0.6678
635.20	0.7411
551.80	0.8258
456.80	0.8809
324.30	0.9330
209.10	0.9632
141.90	0.9786
65.90	0.9942

SA-HA systems (BAC = 8)



ETHANOL (1) + ETHYL ACETATE (2)

CAS	64-17-5	141-78-6
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	XEKOWRVHYACXOJ-UHFFFAOYSA-N
T_c / K	514.00	523.30
P_c / bar	61.37	38.80
ω	0.644	0.366

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 85.47$$

$$B/\text{MPa} = 92.76$$

Deviations

$$\text{MAPE on } x = 19 \%$$

$$\text{MAPE on } y = 14 \%$$

$$\text{MAPE on } x_c = 119 \%$$

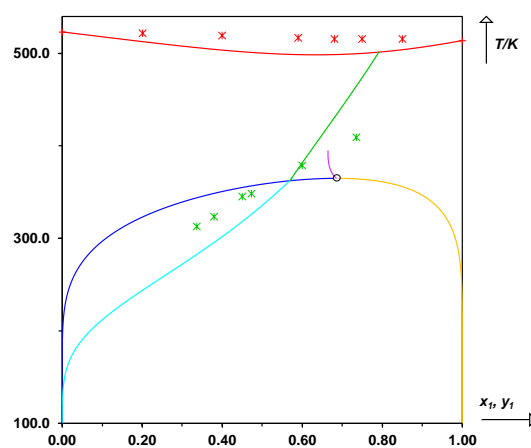
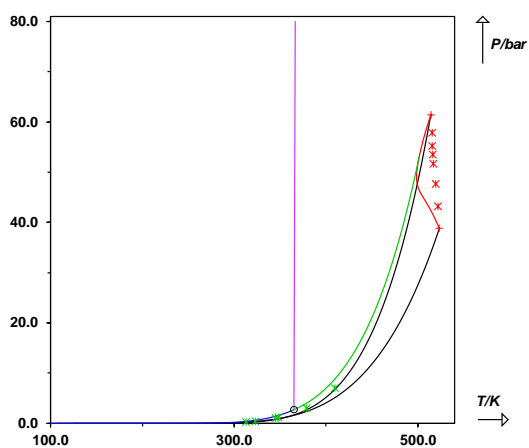
$$\text{MAPE on } P_c = 19 \%$$

$$\text{MAPE on } x_{az} = 9.2 \%$$

$$\text{MAPE on } P_{az} = 2.9 \%$$

$$\text{MAPE on } h^M = 34 \%$$

$$\text{MAPE on } c_p^M = 200 \%$$



Isothermal phase equilibrium data

Mertl, I., Liquid-vapour equilibrium. II. Phase equilibria in the ternary system ethyl acetate-ethanol-water, Collection of Czechoslovak Chemical Communications. 37 (1972) 366-374. doi:10.1135/ccccc19720366

T / K = 313.15

P / bar	x ₁	y ₁
0.1821	0.9940	0.9780
0.2012	0.9560	0.8560
0.2175	0.9160	0.7730
0.2440	0.8130	0.6300
0.2559	0.7580	0.5720
0.2662	0.6800	0.5160
0.2777	0.5460	0.4400
0.2802	0.5050	0.4260
0.2824	0.4480	0.3930
0.2842	0.3370	0.3360
0.2842	0.3355	0.3355
0.2828	0.2510	0.2840
0.2728	0.1150	0.1710
0.2674	0.0800	0.1290
0.2604	0.0400	0.0720

Pavliček, Jan - Bogdanić, Grozdana - Wichterle, Ivan, Vapour-liquid and chemical equilibria in the ethyl ethanoate+ethanol+propyl ethanoate+propanol system accompanied with transesterification reaction, Fluid Phase Equilibria. 328 (2012) 61-68. doi:10.1016/j.fluid.2012.05.016

T / K = 323.15

P / bar	x ₁	y ₁
0.3022	0.9905	0.9667
0.3170	0.9693	0.9037
0.3428	0.9245	0.8027
0.3591	0.8887	0.7440
0.3737	0.8517	0.6926
0.3917	0.7912	0.6287
0.4113	0.6984	0.5569
0.4214	0.6285	0.5111
0.4289	0.5513	0.4682
0.4340	0.4671	0.4241
0.4360	0.3795	0.3795
0.4360	0.3732	0.3733
0.4327	0.2601	0.3059
0.4242	0.1737	0.2362
0.4148	0.1166	0.1788
0.4012	0.0614	0.1069
0.3868	0.0184	0.0360

AZEO

AZEO

Mertl, I., Liquid-vapour equilibrium. II. Phase equilibria in the ternary system ethyl acetate-ethanol-water, Collection of Czechoslovak Chemical Communications. 37 (1972) 366-374. doi:10.1135/ccccc19720366

T / K = 328.15

P / bar	x ₁	y ₁
0.3790	0.9945	0.9815
0.4033	0.9630	0.8960
0.4336	0.9170	0.7990
0.4662	0.8490	0.7030
0.4804	0.8040	0.6520
0.4954	0.7570	0.6110
0.5152	0.6600	0.5470
0.5300	0.5360	0.4790
0.5360	0.4080	0.3990
0.5345	0.3180	0.3480
0.5326	0.2850	0.3260
0.5136	0.1470	0.2140
0.5020	0.1020	0.1610
0.4866	0.0560	0.0980

Nagata, Isamu - Yamada, Toshiro - Nakagawa, Shigeo, Excess Gibbs free energies and heats of mixing for binary systems ethyl acetate with methanol, ethanol, 1-propanol, and 2-propanol, Journal of Chemical & Engineering Data. 20 (1975) 271-275. doi:10.1021/je60066a007

T / K = 328.15

P / bar	x ₁	y ₁
0.4309	0.9190	0.8110
0.4517	0.8880	0.7600
0.4738	0.8350	0.6870
0.5062	0.7270	0.5940
0.5266	0.6150	0.5110
0.5318	0.5720	0.4890
0.5370	0.5050	0.4540
0.5389	0.4060	0.3960
0.5380	0.2920	0.3280
0.5250	0.1860	0.2510
0.5025	0.1100	0.1750

Mertl, I., Liquid-vapour equilibrium. II. Phase equilibria in the ternary system ethyl acetate-ethanol-water, Collection of Czechoslovak Chemical Communications. 37 (1972) 366-374. doi:10.1135/ccccc19720366

T / K = 343.15

P / bar	x ₁	y ₁
0.7314	0.9935	0.9825
0.7458	0.9820	0.9540
0.8447	0.8690	0.7630
0.8861	0.7900	0.6790
0.9071	0.7370	0.6330

SA-HA systems (BAC = 8)

0.9383	0.6130	0.5460	345.46	0.5820	0.5320	
0.9466	0.5480	0.5070	345.06	0.4830	0.4700	
0.9495	0.5120	0.4830	345.00	0.4500	0.4500	AZEO
0.9482	0.3750	0.4030	345.00	0.3900	0.4080	
0.9418	0.3090	0.3590	345.36	0.2910	0.3460	
0.9303	0.2450	0.3190	345.94	0.1950	0.2700	
0.9055	0.1780	0.2530	347.55	0.0870	0.1640	
0.8687	0.0970	0.1610	348.86	0.0380	0.0760	
0.8471	0.0680	0.1120				
0.8207	0.0250	0.0520				

Pavliček, Jan - Bogdanić, Grozdana - Wichterle, Ivan, Vapour-liquid and chemical equilibria in the ethyl ethanoate+ethanol+propyl ethanoate+propanol system accompanied with transesterification reaction, Fluid Phase Equilibria. 328 (2012) 61-68. doi:10.1016/j.fluid.2012.05.016

T / K = 348.15

P / bar	x ₁	y ₁
0.9035	0.9890	0.9737
0.9337	0.9646	0.9206
0.9828	0.9171	0.8378
1.014	0.8819	0.7863
1.041	0.8447	0.7446
1.072	0.7831	0.6830
1.106	0.6898	0.6087
1.122	0.6170	0.5607
1.131	0.5411	0.5141
1.134	0.4728	0.4728
1.134	0.4582	0.4636
1.127	0.3659	0.4045
1.104	0.2525	0.3236
1.071	0.1696	0.2465
1.040	0.1139	0.1817
1.003	0.0615	0.1092
0.9651	0.0186	0.0359

AZEO

Susial, P. - Rodriguez-Henriquez, J.J. - Sosa-Rosario, A. - Rios-Santana, R., Vapor-Liquid Equilibrium of Ethyl Acetate + CnH2n+1OH (n= 1,2,3) Binary Systems at 0.3 MPa, Chinese Journal of Chemical Engineering. 20 (2012) 723-730. doi:10.1016/S1004-9541(11)60241-3

P / bar = 3.000

T / K	x ₁	y ₁
386.65	0.0280	0.0560
386.15	0.0420	0.0830
385.75	0.0560	0.1090
384.45	0.0960	0.1730
383.45	0.1350	0.2220
382.45	0.1730	0.2690
381.65	0.2220	0.3260
381.35	0.2460	0.3480
380.95	0.2690	0.3700
380.55	0.3040	0.4020
380.25	0.3480	0.4340
379.35	0.4640	0.5230
379.25	0.4940	0.5420
379.15	0.5140	0.5520
378.95	0.5990	0.5990
379.05	0.6760	0.6420
379.15	0.7010	0.6590
379.25	0.7400	0.6920
380.25	0.8640	0.8080
381.15	0.9470	0.9100
381.85	0.9880	0.9710

AZEO

Isobaric phase equilibrium data

Li, Qunsheng - Zhang, Jiguo - Lei, Zhigang - Zhu, Jiujuan - Xing, Fengying, Isobaric Vapor-Liquid Equilibrium for Ethyl Acetate + Ethanol + 1-Ethyl-3-methylimidazolium Tetrafluoroborate, Journal of Chemical & Engineering Data. 54 (2009) 193-197. doi:10.1021/jc800175s

P / bar = 1.013

T / K	x ₁	y ₁
350.13	0.9510	0.8940
348.85	0.8930	0.8080
347.04	0.8050	0.7010
346.13	0.6770	0.6110

Susial, Pedro - Sosa-Rosario, Aday - Rodríguez-Henríquez, Juan José - Rios-Santana, Raul, Vapor Pressure and VLE Data Measurements on Ethyl Acetate/Ethanol Binary System at 0.1, 0.5, and 0.7 MPa, JOURNAL OF CHEMICAL ENGINEERING OF JAPAN. 44 (2011) 155-163. doi:10.1252/jcej.10we176

P / bar = 7.000

T / K	x ₁	y ₁
410.95	0.9940	0.9880
410.65	0.9710	0.9590
410.15	0.9160	0.8970
409.95	0.8970	0.8770
409.85	0.8770	0.8570

SA-HA systems (BAC = 8)

409.50	0.7350	0.7350	AZEO	Zhang, Rui - Yan, Weidong - Wang, Xu - Lin, Ruisen, Molar excess enthalpies of ethyl acetate+alkanols at T=298.15K, p=10.0MPa, Thermochimica Acta. 429 (2005) 155-161. doi:10.1016/j.tca.2005.03.009
409.65	0.6760	0.6920		
409.75	0.6420	0.6670		
409.95	0.6160	0.6510		
410.05	0.5890	0.6420		T / K = 298.15
410.25	0.5610	0.6250		P / bar = 100.00
410.45	0.5330	0.6070		$h^M / \text{J.mol}^{-1}$ z_1
410.65	0.5040	0.5890		141.00 0.9700
411.05	0.4740	0.5710		247.40 0.9460
411.85	0.4130	0.5230		365.90 0.9220
412.35	0.3810	0.4940		469.60 0.8960
412.95	0.3370	0.4540		566.00 0.8700
413.85	0.2920	0.4140		660.90 0.8430
414.35	0.2690	0.3920		755.10 0.8160
415.05	0.2340	0.3590		845.90 0.7870
416.65	0.1850	0.3040		931.10 0.7570
417.65	0.1480	0.2570		1007.3 0.7260
418.45	0.1220	0.2220		1082.3 0.6940
419.25	0.0960	0.1850		1148.0 0.6610
422.05	0.0280	0.0700		1204.2 0.6270
422.65	0.0140	0.0420		1250.7 0.5910
				1297.6 0.5540
				1328.2 0.5150
				1337.5 0.4750
				1330.4 0.4330
				1309.3 0.3890
				1259.2 0.3430
				1192.7 0.2950
				1087.9 0.2460
				947.10 0.1930
				763.20 0.1390
				508.90 0.0810
				399.50 0.0610
				274.40 0.0400
Enthalpy of mixing				
Ortega, J., Excess enthalpy. Ethanol-ethyl ethanoate system, Int. Data Ser. Sel. Data Mixtures Ser. A. 23 (1995)				
				T / K = 298.15
				P / bar = 1.010
				$h^M / \text{J.mol}^{-1}$ z_1
177.50	0.9651			947.10 0.1930
363.70	0.9229			763.20 0.1390
545.20	0.8787			508.90 0.0810
712.30	0.8330			399.50 0.0610
864.50	0.7862			274.40 0.0400
997.10	0.7387			
1109.3	0.6923			
1199.0	0.6478			
1277.3	0.6061			
1284.8	0.6028			
1328.0	0.5661			
1345.0	0.5557			
1379.7	0.4986			
1378.1	0.4329			
1315.6	0.3573			
1161.9	0.2737			
892.10	0.1848			
539.20	0.0928			
				Heat capacity of mixing
				Tanaka, Reiji - Toyama, Satoru, Excess Molar Volumes and Excess Molar Heat Capacities for Binary Mixtures of Ethanol with Chlorocyclohexane, 1-Nitropropane, Dibutyl Ether, and Ethyl Acetate at the Temperature of 298.15 K, Journal of Chemical & Engineering Data. 41 (1996) 1455-1458. doi:10.1021/je960179m
				T / K = 298.15
				P / bar = UNKNOWN (1.0132)
				$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1
				2.740 0.8926
				4.700 0.7988
				6.310 0.6959
				7.250 0.5960

SA-HA systems (BAC = 8)

7.560	0.4972	3.010	0.1504
7.170	0.3986	1.890	0.1003
6.010	0.2981	0.8200	0.0500
5.280	0.2577	0.2300	0.0250
4.720	0.2287		
4.120	0.1999		
2.900	0.1493		
2.430	0.1294		
1.760	0.1007		
1.518	0.0901		
1.075	0.0696		
0.9020	0.0603		
0.7230	0.0505		
0.5390	0.0403		
0.3660	0.0291		
0.2760	0.0233		
0.2530	0.0209		
0.1740	0.0160		
0.1180	0.0120		
0.1070	0.0097		
0.0590	0.0071		
0.0320	0.0050		
0.0090	0.0031		
-0.0020	0.0014		

Wen-jun, Fang - Qing-sen, Yu - Rui-sen, Lin - Han-xing, Zong, Vapor heat capacity of binary and ternary systems, *Thermochimica Acta.* 299 (1997) 43-47. doi:10.1016/S0040-6031(97)00135-4

T / K = 404.60

P / bar = 1.013

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ z_1

4.683	0.8082
6.018	0.6556
5.440	0.5154
2.369	0.3634
0.3300	0.2714
0.4537	0.1266

Critical point

Hu, Tuoping - Qin, Zhangfeng - Wang, Guofu - Hou, Xianglin - Wang, Jianguo, Critical Properties of the Reacting Mixture in the Esterification of Acetic Acid with Ethanol, *Journal of Chemical & Engineering Data.* 49 (2004) 1809-1814. doi:10.1021/jc049771z

T / K	P / bar	x_1
515.30	55.20	0.7500
515.40	57.80	0.8500
515.90	53.50	0.6800
516.80	51.70	0.5900
519.20	47.70	0.4000
521.60	43.20	0.2000

Hu, Jianhua - Tamura, Katsutoshi - Murakami, Sachio, Excess thermodynamic properties of binary mixtures of ethyl acetate with benzene, ethanol, and 2,2,2-trifluoroethan-1-ol at 298.15 K, *Fluid Phase Equilibria.* 134 (1997) 239-253. doi:10.1016/S0378-3812(97)00015-0

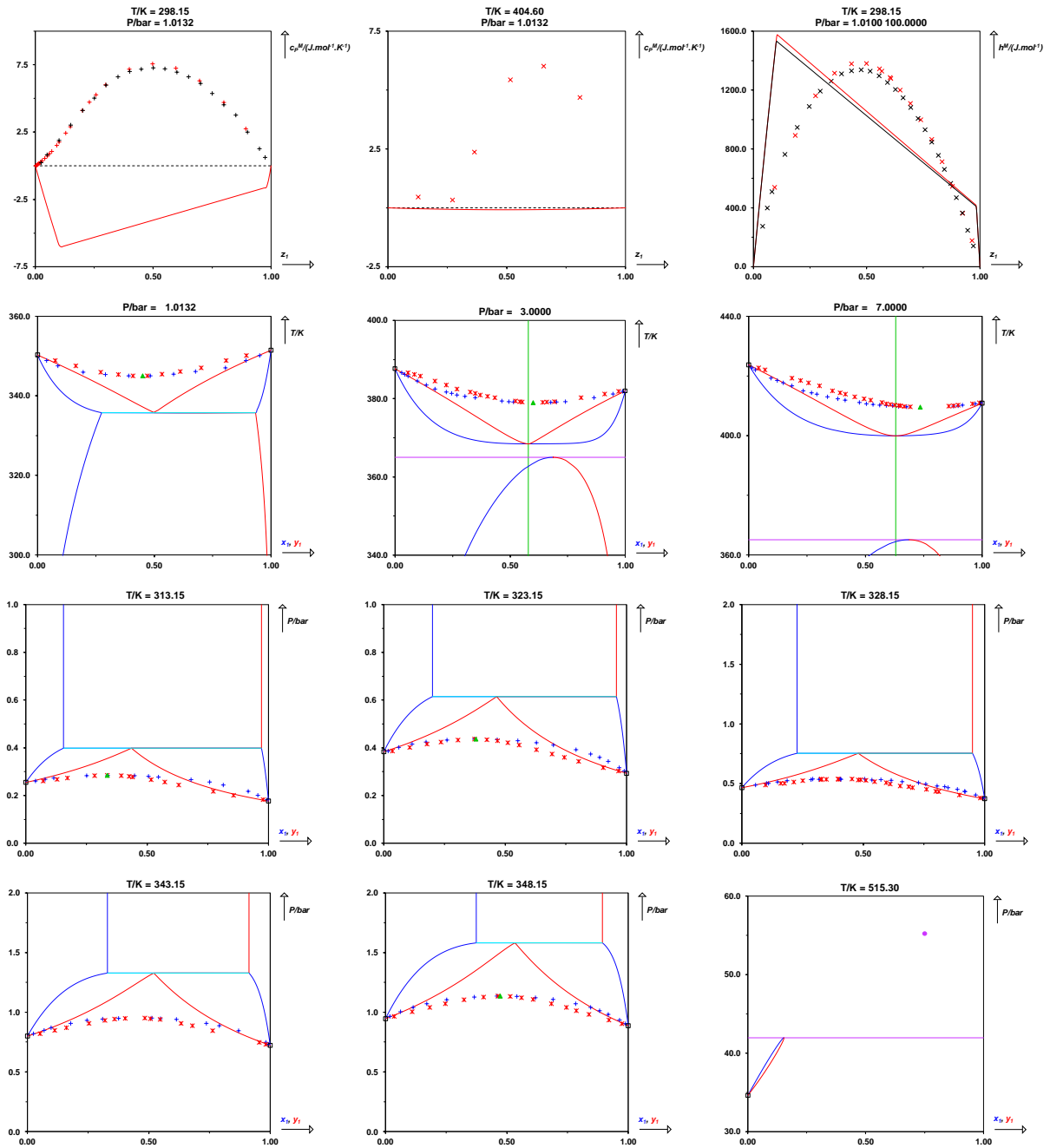
T / K = 298.15

P / bar = UNKNOWN (1.0132)

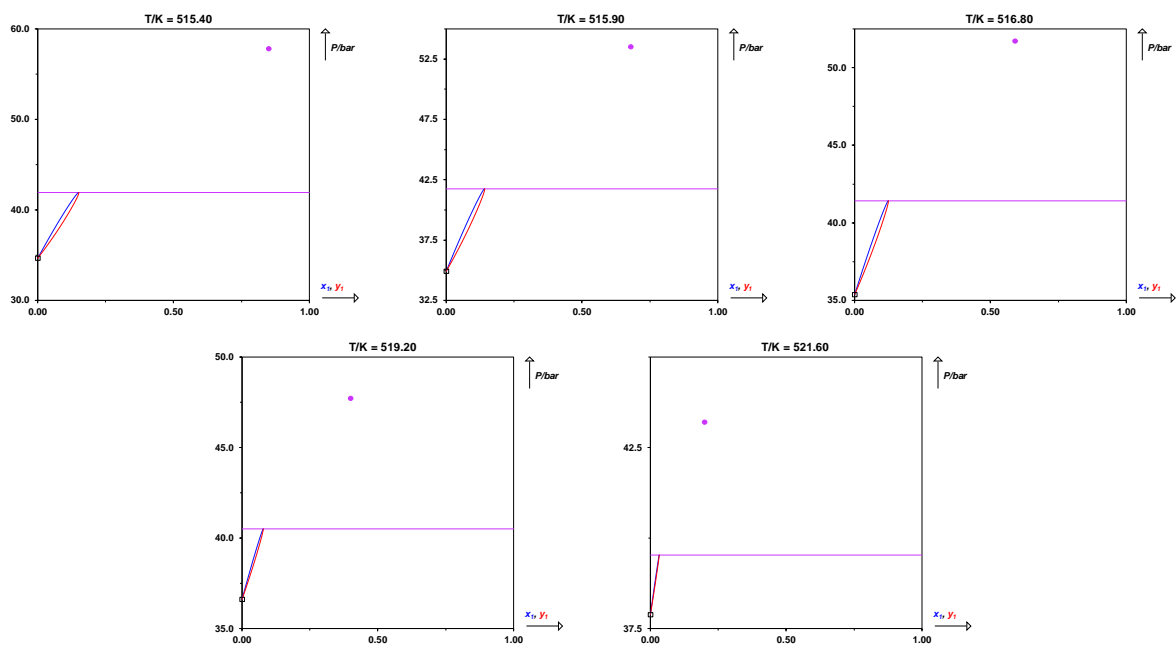
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

0.6300	0.9750
1.260	0.9500
2.490	0.9000
3.750	0.8500
4.540	0.8000
5.380	0.7500
6.100	0.7000
6.610	0.6500
6.960	0.6000
7.200	0.5500
7.270	0.5000
7.180	0.4500
6.990	0.4000
6.600	0.3500
5.990	0.3000
5.030	0.2506
4.100	0.2005

SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



ETHANOL (1) + METHYL tert-BUTYL ETHER (2)

CAS	64-17-5	1634-04-4
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	BZLVMXJERCZMT-UHFFFAOYSA-N
T_c / K	514.00	497.10
P_c / bar	61.37	32.86
ω	0.644	0.247

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 76.67$$

$$B/\text{MPa} = 11.14$$

Deviations

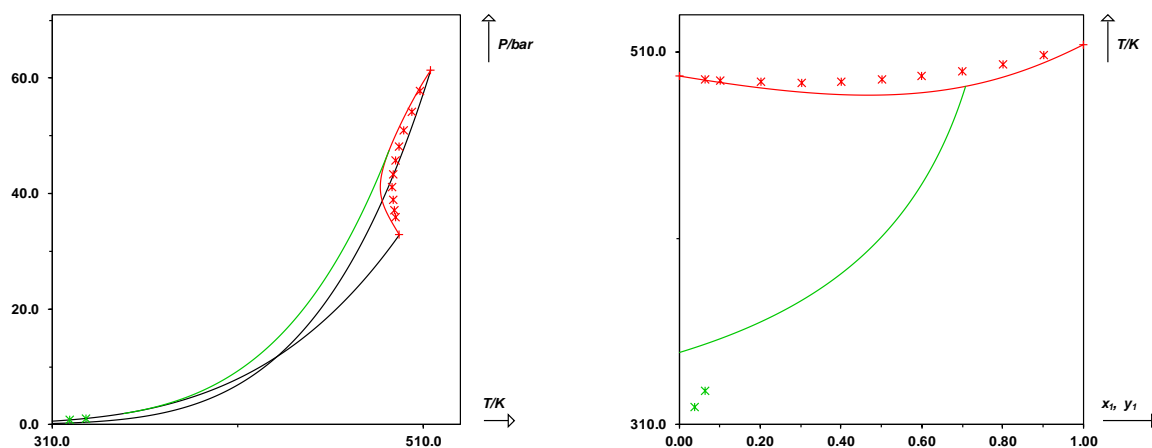
$$\text{MAPE on } x = 17\%$$

$$\text{MAPE on } y = 8.8\%$$

$$\text{MAPE on } x_c = 35\%$$

$$\text{MAPE on } P_c = 7.8\%$$

$$\text{MAPE on } h^M = 41\%$$



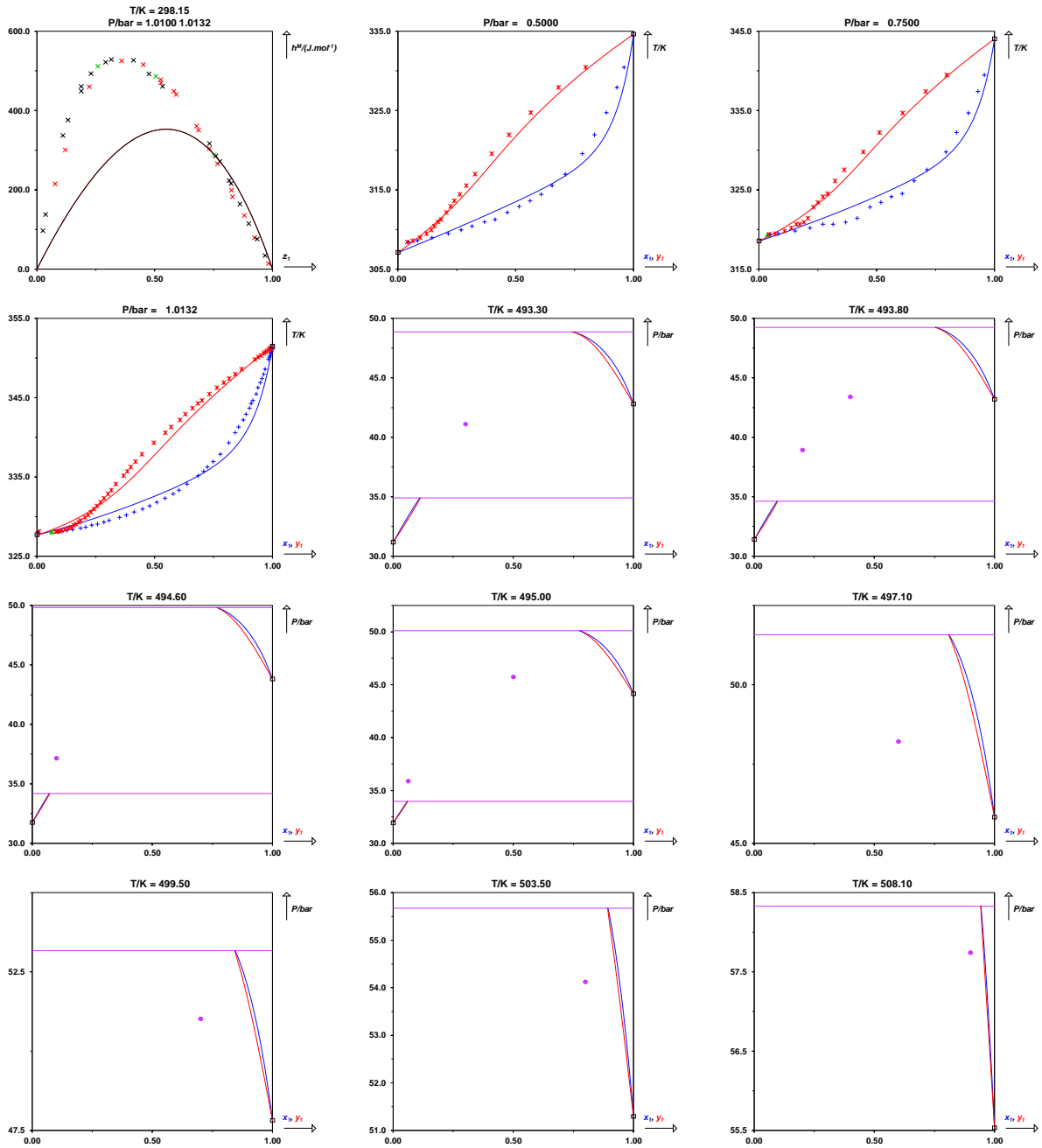
-----			320.66	0.2710	0.1590	
Isobaric phase equilibrium data			320.18	0.2160	0.1370	
-----			319.79	0.1530	0.1090	
Mejía, Andrés - Segura, Hugo - Cartes, Marcela,			319.47	0.0830	0.0700	
Vapor-Liquid Equilibria and Interfacial Tensions of the			319.37	0.0460	0.0430	
System Ethanol + 2-Methoxy-2-methylpropane, Journal of			319.32	0.0370	0.0370	AZEO
Chemical & Engineering Data. 55 (2010) 428-434.						
doi:10.1021/je9004068						
P / bar = 0.5000						
T / K	x ₁	y ₁				
330.45	0.9600	0.7970				
327.90	0.9300	0.6820				
324.74	0.8850	0.5630				
321.92	0.8340	0.4710				
319.54	0.7830	0.3980				
316.99	0.7100	0.3270				
315.54	0.6550	0.2900				
314.44	0.6080	0.2620				
313.62	0.5600	0.2400				
312.90	0.5150	0.2240				
312.14	0.4640	0.2050				
311.26	0.4130	0.1830				
310.93	0.3680	0.1710				
310.41	0.3140	0.1540				
309.94	0.2680	0.1410				
309.47	0.2130	0.1210				
308.96	0.1450	0.0940				
308.58	0.0830	0.0630				
308.40	0.0460	0.0390				
Mejía, Andrés - Segura, Hugo - Cartes, Marcela,						
Vapor-Liquid Equilibria and Interfacial Tensions of the						
System Ethanol + 2-Methoxy-2-methylpropane, Journal of						
Chemical & Engineering Data. 55 (2010) 428-434.						
doi:10.1021/je9004068						
P / bar = 0.7500						
T / K	x ₁	y ₁				
339.48	0.9570	0.7970				
337.38	0.9290	0.7080				
334.68	0.8890	0.6090				
332.22	0.8380	0.5120				
329.79	0.7940	0.4430				
327.54	0.7140	0.3620				
326.14	0.6590	0.3230				
324.53	0.6080	0.2910				
324.14	0.5620	0.2710				
323.42	0.5170	0.2490				
322.80	0.4720	0.2310				
321.40	0.4160	0.2080				
320.92	0.3680	0.1910				
320.64	0.3140	0.1740				
			Arce, Alberto - Martínez-Ageitos, José - Soto, Ana, VLE			
			Measurements of Binary Mixtures of Methanol, Ethanol,			
			2-Methoxy-2-methylpropane, and 2-Methoxy-2-			
			methylbutane at 101.32 kPa, Journal of Chemical &			
			Engineering Data. 41 (1996) 718-723.			
			doi:10.1021/je950323o			
			P / bar = 1.013			
			T / K	x ₁	y ₁	
			351.34	0.9994	0.9966	
			351.21	0.9981	0.9909	
			351.18	0.9980	0.9901	
			351.05	0.9966	0.9837	
			350.86	0.9952	0.9763	
			350.73	0.9938	0.9695	
			350.59	0.9923	0.9624	
			350.33	0.9895	0.9508	
			350.11	0.9869	0.9390	
			349.81	0.9830	0.9255	
			348.59	0.9689	0.8692	
			347.97	0.9624	0.8422	
			347.40	0.9551	0.8162	
			346.90	0.9478	0.7929	
			346.24	0.9376	0.7639	
			345.47	0.9302	0.7323	
			344.65	0.9167	0.6998	
			344.26	0.9092	0.6832	
			343.68	0.9014	0.6607	
			342.92	0.8871	0.6299	
			342.18	0.8754	0.6063	
			341.28	0.8566	0.5700	
			340.56	0.8422	0.5452	
			339.30	0.8145	0.4963	
			337.86	0.7776	0.4457	
			336.94	0.7482	0.4185	
			336.24	0.7234	0.3979	
			335.69	0.7071	0.3840	
			335.13	0.6851	0.3676	
			334.09	0.6377	0.3345	
			333.33	0.6024	0.3153	
			332.85	0.5782	0.3009	
			332.29	0.5432	0.2839	
			331.79	0.5093	0.2692	
			331.35	0.4789	0.2545	

330.95	0.4479	0.2421		alcohol (n = 1,2,3,5), J. Therm. Anal. Calorim. 70 (2002) 251-254. doi:10.1023/A:1020634507355
330.56	0.4117	0.2298		
330.18	0.3793	0.2162		T / K = 298.15
329.89	0.3511	0.2037		P / bar = 1.013
329.49	0.3057	0.1850		$h^M / J.mol^{-1}$ z_1
329.28	0.2839	0.1775		34.00 0.9677
329.06	0.2569	0.1662		76.00 0.9353
328.90	0.2323	0.1561		115.00 0.8998
328.68	0.2070	0.1455		164.00 0.8618
328.54	0.1847	0.1347		216.00 0.8248
328.37	0.1523	0.1188		223.00 0.8163
328.24	0.1272	0.1048		272.00 0.7763
328.15	0.1058	0.0921		285.00 0.7589
328.12	0.0937	0.0844		317.00 0.7324
328.11	0.0864	0.0804		461.00 0.5340
328.06	0.0630	0.0630	AZEO	492.00 0.4757
328.09	0.0035	0.0082		527.00 0.4090
				529.00 0.3157
				522.00 0.2910
				493.00 0.2301
				449.00 0.1873
				461.00 0.1870
				376.00 0.1320
				337.00 0.1098
				138.00 0.0372
				97.00 0.0252
Enthalpy of mixing				
Letcher, Trevor M. - Govender, Penny U., Excess Molar Enthalpies of an Alkanol + a Branched Chain Ether at the Temperature 298.15 K, Journal of Chemical & Engineering Data. 40 (1995) 997-1000. doi:10.1021/jc00020a060				
T / K =	298.15			
P / bar =	1.010			
$h^M / J.mol^{-1}$	z_1			
14.00	0.9820			
79.40	0.9230			
135.50	0.8810			
183.00	0.8300			
198.90	0.8250			
266.10	0.7660			
304.00	0.7320			
350.40	0.6860			
361.00	0.6780			
440.60	0.5910			
448.70	0.5810			
470.10	0.5260			
478.10	0.5250			
515.80	0.4510			
525.60	0.3590			
460.10	0.2220			
300.80	0.1200			
214.90	0.0770			
Cebreiro, S.M. - Illobre, M. - Mato, M.M. - Verdes, P.V. - Legido, J.L. - Paz Andrade, M.I., Excess molar enthalpies at 298.15 K of the binary mixtures. tert-butyl methyl ether +				
Mato, Marta M. - Illobre, M. - Verdes, Pedro V. - Legido, José Luis - Andrade, María Inmaculada Paz, Study on the effect of increasing the chain length of the alkanol in excess molar enthalpies of mixtures containing 2-methoxy-2-methylpropane, 1-alkanol, decane, Fluid Phase Equilibria. 296 (2010) 37-41. doi:10.1016/j.fluid.2010.02.012				
T / K =	298.15			
P / bar =	1.013			
$h^M / J.mol^{-1}$	z_1			
288.00	0.7522			
486.00	0.5044			
512.00	0.2582			
Critical point				
Han, Kewei - Xia, Shuqian - Ma, Peisheng - Yan, Fangyou - Liu, Tao, Measurement of critical temperatures and critical pressures for binary mixtures of methyl tert-butyl ether (MTBE)+alcohol and MTBE+alkane, The Journal of Chemical Thermodynamics. 62 (2013) 111-117. doi:10.1016/j.jct.2013.03.002				
T / K	P / bar	x_1		
493.30	41.10	0.3011		

SA-HA systems (BAC = 8)

493.80	38.90	0.2007
493.90	43.38	0.4005
494.60	37.12	0.1005
495.00	35.86	0.0620
495.00	45.72	0.5003
497.10	48.20	0.5997
499.50	51.01	0.7005
503.50	54.12	0.7999
508.10	57.74	0.9000

SA-HA systems (BAC = 8)



ETHANOL (1) + DI-n-BUTYL ETHER (2)

CAS	64-17-5	142-96-1
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	DURPTKYDGMDSBL-UHFFFAOYSA-N
T_c / K	514.00	584.10
P_c / bar	61.37	24.60
ω	0.644	0.448

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 102.0$$

$$B/\text{MPa} = 38.43$$

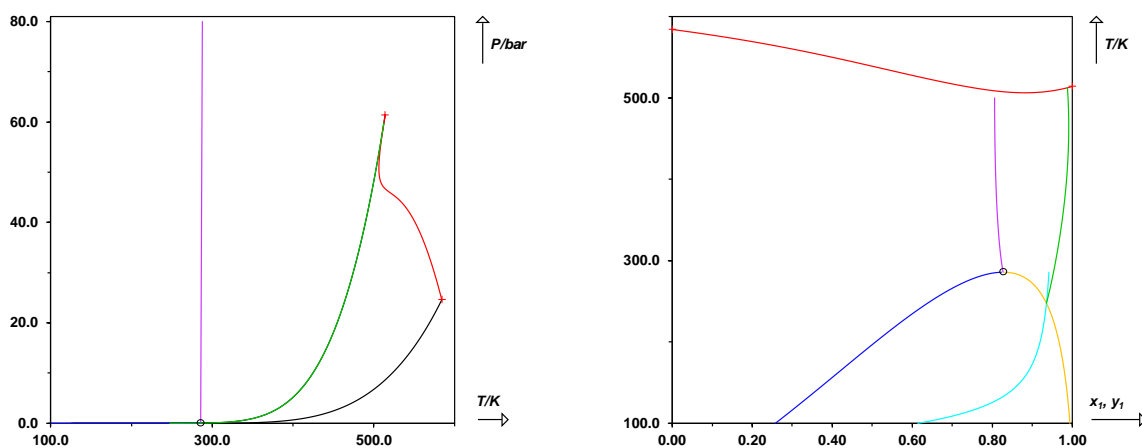
Deviations

$$\text{MAPE on } x = 50 \%$$

$$\text{MAPE on } y = 10 \%$$

$$\text{MAPE on } h^M = 47 \%$$

$$\text{MAPE on } c_p^M = 181 \%$$



----- Isothermal phase equilibrium data -----			P / bar	x ₁	y ₁
Gmehling, J., VLE data for the design of separation processes, AIChE Symp. Ser. 81 (1985) 121-129.			0.1654	0.0115	0.2473
T / K = 323.15			0.2330	0.0325	0.4700
P / bar	x ₁	y ₁	0.3198	0.0641	0.6310
0.0658	0.0351	0.5026	0.4327	0.1121	0.7399
0.0968	0.0704	0.6708	0.5091	0.1521	0.7822
0.1261	0.1191	0.7631	0.6380	0.2314	0.8322
0.1535	0.1655	0.8105	0.7672	0.3540	0.8694
0.1784	0.2128	0.8404	0.8444	0.4822	0.8932
0.1940	0.2478	0.8608	0.8865	0.5836	0.9045
0.2100	0.3061	0.8687	0.9187	0.6672	0.9137
0.2351	0.4634	0.8897	0.9472	0.7451	0.9247
0.2481	0.5642	0.8992	0.9695	0.8031	0.9344
0.2561	0.6034	0.9086	0.9808	0.8337	0.9403
0.2634	0.7079	0.9161	1.002	0.8893	0.9532
0.2710	0.7834	0.9292	1.015	0.9219	0.9640
0.2751	0.8091	0.9380	1.031	0.9625	0.9806
0.2800	0.8650	0.9465	1.036	0.9874	0.9928
0.2876	0.9501	0.9782			
0.2920	0.9927	0.9964			

Gmehling, J., VLE data for the design of separation processes, AIChE Symp. Ser. 81 (1985) 121-129.

----- Isothermal phase equilibrium data -----		
T / K = 338.15		
P / bar	x ₁	y ₁
0.1520	0.0416	0.5411
0.1787	0.0598	0.6228
0.2015	0.0722	0.6702
0.2361	0.0910	0.7223
0.2584	0.1074	0.7493
0.2773	0.1193	0.7701
0.3224	0.1503	0.8064
0.3666	0.1924	0.8413
0.4095	0.2518	0.8580
0.4346	0.3015	0.8670
0.4566	0.3553	0.8782
0.4788	0.4353	0.8876
0.4937	0.5205	0.8923
0.5147	0.6324	0.9065
0.5322	0.7386	0.9211
0.5560	0.8575	0.9401
0.5640	0.9026	0.9572
0.5706	0.9412	0.9702

Gmehling, J., VLE data for the design of separation processes, AIChE Symp. Ser. 81 (1985) 121-129.

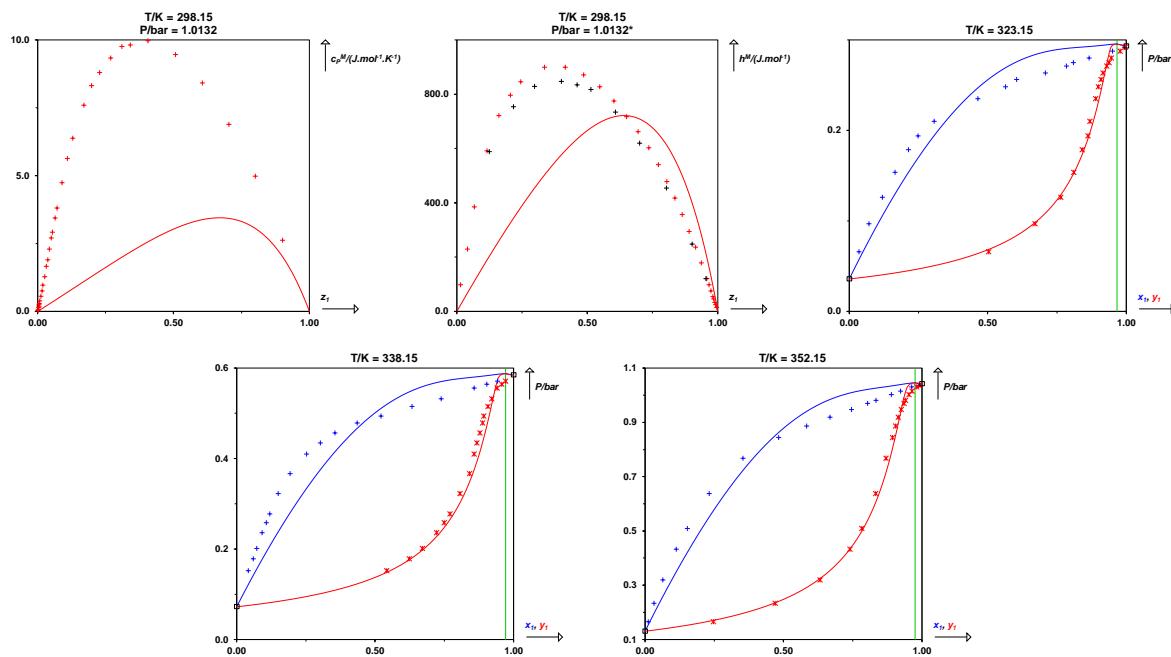
T / K = 352.15

Enthalpy of mixing

Villamañan, M.A. - Casanova, C. - Roux, A.H. - Grolier, J.-P.E., Calorimetric investigation of the interactions between oxygen and hydroxyl groups in (alcohol+ether) at 298.15 K, The Journal of Chemical Thermodynamics. 14 (1982) 251-258. doi:10.1016/0021-9614(82)90015-5

----- Enthalpy of mixing -----	
T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
98.00	0.0137
230.10	0.0405
385.00	0.0663
591.00	0.1153
720.70	0.1613
795.80	0.2043
845.30	0.2448
899.00	0.3361
899.10	0.4155
871.50	0.4851
827.60	0.5466
775.20	0.6015
716.50	0.6506
661.90	0.6949
602.50	0.7350
540.20	0.7716
478.30	0.8050
417.70	0.8356
356.70	0.8639
294.60	0.8899

SA-HA systems (BAC = 8)



ISOPROPANOL (1) + DIISOPROPYL ETHER (2)

CAS	67-63-0	108-20-3
InChiKey	KFZMGEQAYNKOFK-UHFFFAOYSA-N	ZAFNJMIOTHYJRJ-UHFFFAOYSA-N
T_c / K	508.30	500.05
P_c / bar	47.65	28.80
ω	0.663	0.339

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 66.68$$

$$B/\text{MPa} = 22.07$$

Deviations

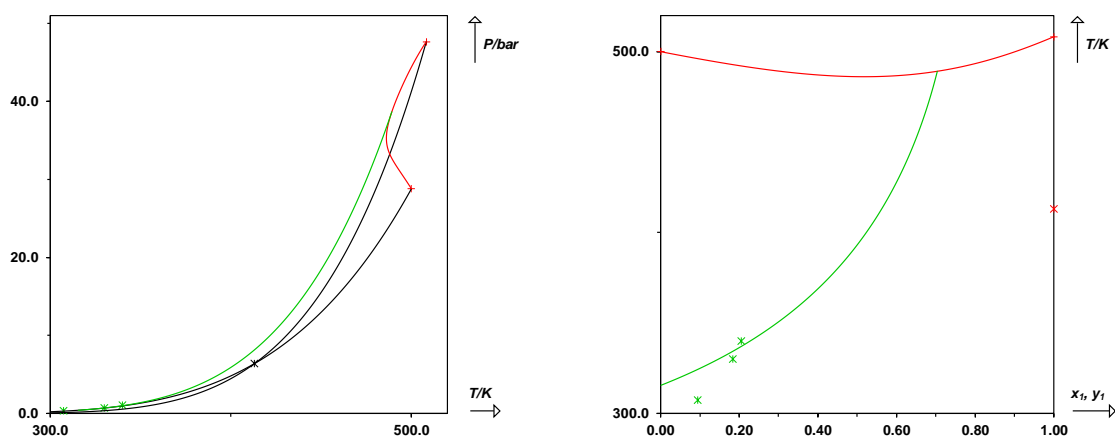
$$\text{MAPE on } x = 19\%$$

$$\text{MAPE on } y = 11\%$$

$$\text{MAPE on } x_{\text{az}} = 8.4\%$$

$$\text{MAPE on } P_{\text{az}} = 3.3\%$$

$$\text{MAPE on } h^{\text{M}} = 39\%$$



Isothermal phase equilibrium data			0.8208	0.8000	0.5400	
Wichterle, I., Isothermal vapor-liquid equilibria in the ternary system propan-2-ol + diisopropyl ether + 2,2,4-trimethylpentane and the three binary subsystems at 330 K and 340 K, ELDATA Int. Electron. J. Phys. Chem. Data. 5 (1999) 179-189.			0.8617	0.7523	0.4944	
T / K =	330.00		0.8975	0.6992	0.4582	
P / bar	x ₁	y ₁	0.9297	0.6415	0.4202	
0.3354	0.9992	0.9912	0.9584	0.5782	0.3859	
0.3436	0.9949	0.9634	0.9804	0.5209	0.3397	
0.3545	0.9872	0.9261	0.9958	0.4674	0.3387	
0.3685	0.9780	0.8818	1.000	0.4516	0.3272	
0.3887	0.9676	0.8289	1.016	0.3855	0.2989	
0.4144	0.9449	0.7623	1.025	0.3255	0.2727	
0.4456	0.9187	0.6936	1.027	0.3039	0.2652	
0.4773	0.8893	0.6319	1.033	0.2414	0.2390	
0.5123	0.8535	0.5710	1.034	0.2050	0.2050	AZEO
0.5443	0.8149	0.5201	1.021	0.1073	0.1439	
0.5771	0.7661	0.4718	1.003	0.0551	0.0881	
0.6334	0.6592	0.3950	-----			
0.6567	0.5970	0.3610	Isobaric phase equilibrium data			
0.6757	0.5359	0.3318	-----			
0.6882	0.4827	0.3111	Lladosa, Estela - Montón, Juan B. - Burguet, M ^a Cruz - Muñoz, Rosa, Effect of pressure and the capability of 2-methoxyethanol as a solvent in the behaviour of a diisopropyl ether-isopropyl alcohol azeotropic mixture, Fluid Phase Equilibria. 262 (2007) 271-279. doi:10.1016/j.fluid.2007.09.014			
0.6925	0.4653	0.3029	P / bar = 0.3000			
0.7009	0.4225	0.2911	T / K	x ₁	y ₁	
0.7057	0.3957	0.2767	324.48	0.9750	0.8790	
0.7153	0.3346	0.2524	320.62	0.9240	0.6830	
0.7180	0.3123	0.2423	317.83	0.8730	0.5700	
0.7235	0.2479	0.2184	315.41	0.8140	0.4650	
0.7271	0.1840	0.1840	313.47	0.7530	0.3940	
0.7234	0.1094	0.1334	312.10	0.6910	0.3470	
0.7137	0.0556	0.0820	310.82	0.6180	0.3070	
Wichterle, I., Isothermal vapor-liquid equilibria in the ternary system propan-2-ol + diisopropyl ether + 2,2,4-trimethylpentane and the three binary subsystems at 330 K and 340 K, ELDATA Int. Electron. J. Phys. Chem. Data. 5 (1999) 179-189.			309.98	0.5530	0.2710	
T / K =	340.00		309.31	0.4920	0.2460	
P / bar	x ₁	y ₁	308.75	0.4340	0.2250	
0.5340	0.9988	0.9913	308.32	0.3740	0.2060	
0.5470	0.9933	0.9618	307.89	0.3160	0.1870	
0.5634	0.9875	0.9250	307.60	0.2540	0.1700	
0.5864	0.9719	0.8836	307.37	0.2040	0.1490	
0.6147	0.9606	0.8294	307.20	0.1530	0.1270	
0.6516	0.9349	0.7639	307.18	0.1020	0.0990	
0.6930	0.9070	0.7015	307.25	0.0936	0.0936	AZEO
0.7359	0.8752	0.6439	307.25	0.0590	0.0670	
0.7803	0.8389	0.5886	307.47	0.0230	0.0310	
Zhang, Zhigang - Yang, Lei - Xing, Yuan - Li, Wenxiu, Vapor-Liquid Equilibrium for Ternary and Binary Mixtures of 2-Isopropoxypropane, 2-Propanol, and N,N-Dimethylacetamide at 101.3 kPa, Journal of Chemical						

& Engineering Data. 58 (2013) 357-363.
doi:10.1021/je300994y

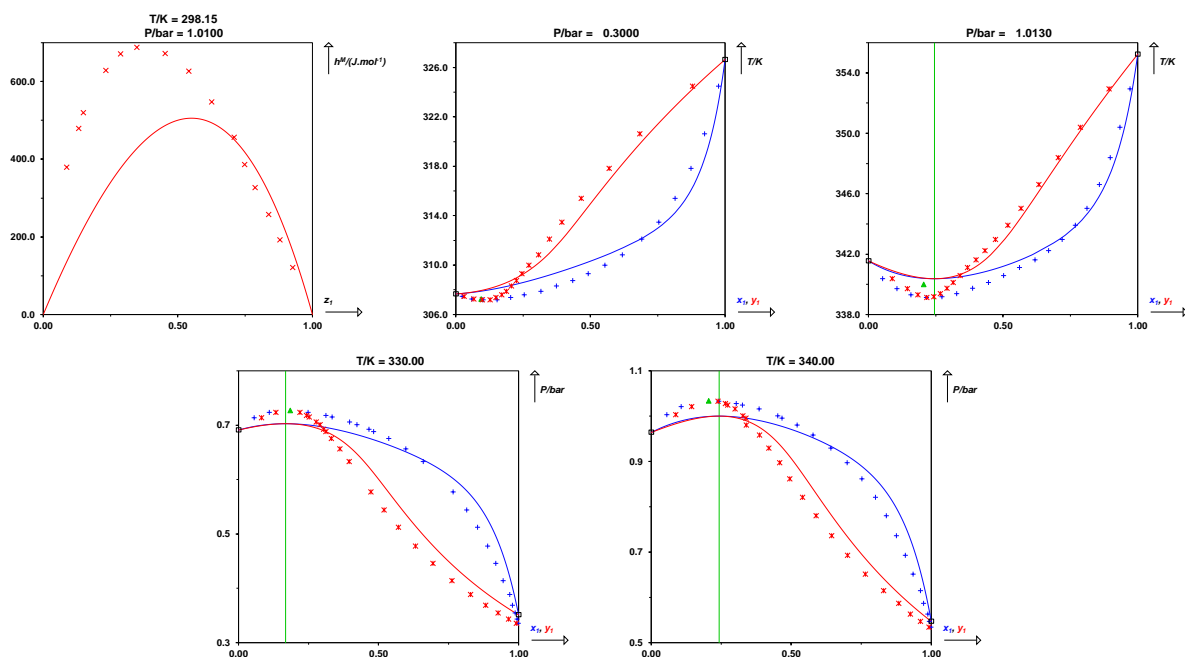
P / bar =	1.013	
T / K	x_1	y_1
352.94	0.9710	0.8940
350.39	0.9340	0.7870
348.39	0.8980	0.7050
346.61	0.8580	0.6320
345.02	0.8110	0.5660
343.92	0.7680	0.5170
342.97	0.7190	0.4710
342.23	0.6690	0.4330
341.63	0.6180	0.4000
341.10	0.5610	0.3680
340.57	0.5010	0.3400
340.13	0.4450	0.3150
339.73	0.3870	0.2910
339.39	0.3280	0.2670
339.18	0.2720	0.2430
339.13	0.2150	0.2160
339.30	0.1580	0.1830
339.71	0.1060	0.1440
340.37	0.0530	0.0880

----- Enthalpy of mixing -----

Letcher, Trevor M. - Govender, Penny U., Excess Molar Enthalpies of an Alkanol + a Branched Chain Ether at the Temperature 298.15 K, Journal of Chemical & Engineering Data. 40 (1995) 997-1000. doi:10.1021/je00020a060

T / K =	298.15	
P / bar =	1.010	
$h^M / \text{J.mol}^{-1}$	z_1	
120.60	0.9260	
192.40	0.8790	
257.60	0.8370	
326.40	0.7870	
386.30	0.7480	
456.30	0.7090	
547.60	0.6260	
626.20	0.5400	
672.10	0.4520	
688.30	0.3480	
670.70	0.2870	
628.70	0.2320	
520.20	0.1490	
479.00	0.1310	
379.40	0.0870	

SA-HA systems (BAC = 8)



DIETHYLAMINE (1) + ETHYL ACETATE (2)

CAS	109-89-7	141-78-6
InChiKey	HPNMFZURTQLUMO-UHFFFAOYSA-N	XEKOWRVHYACXOJ-UHFFFAOYSA-N
T_c / K	496.60	523.30
P_c / bar	37.10	38.80
ω	0.304	0.366

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

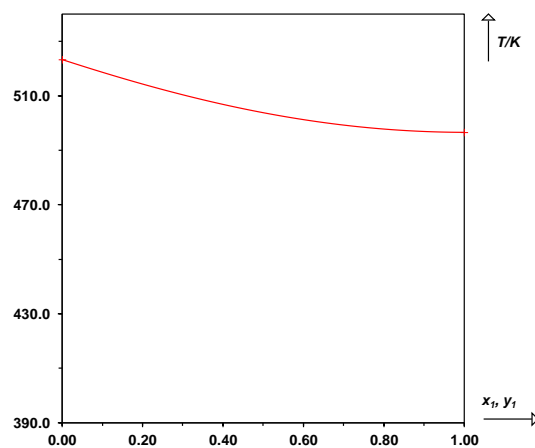
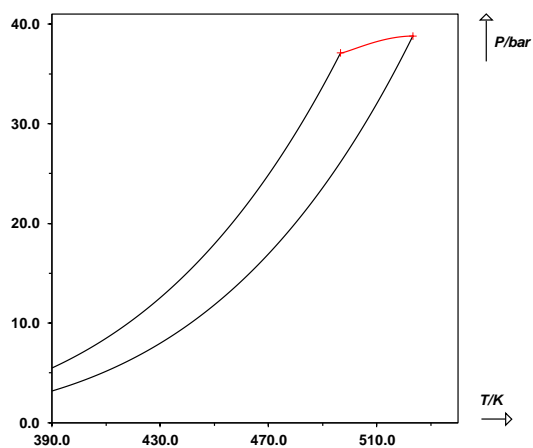
$$A/\text{MPa} = 10.58$$

$$B/\text{MPa} = -9.924$$

Deviations

$$\text{MAPE on } x = 7.1\%$$

$$\text{MAPE on } y = 6.0\%$$

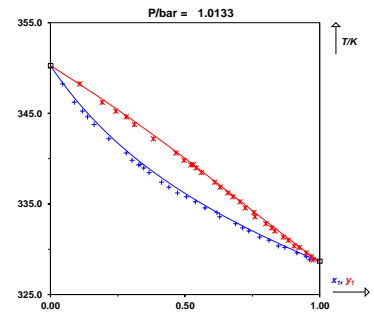
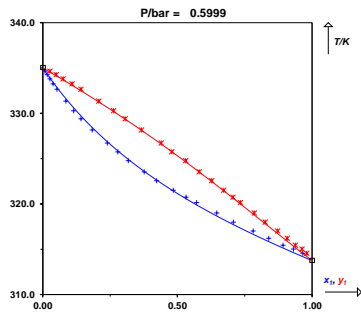
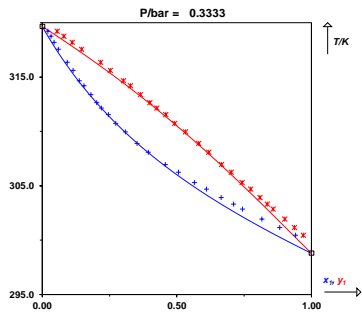


-----			329.40	0.1420	0.3060
Isobaric phase equilibrium data			328.15	0.1840	0.3660
-----			326.70	0.2400	0.4400
Engelmann, K. - Bittrich, H.J., Isobaric liquid-vapor equilibriums of the system diethylamine-ethyl acetate, diethylamine-1,4-dioxane and ethyl acetate-1,4-dioxane at reduced pressures, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 289-291.			325.75	0.2780	0.4790
P / bar = 0.3333			324.75	0.3180	0.5300
T / K	x ₁	y ₁	323.55	0.3760	0.5810
319.20	0.0200	0.0550	322.55	0.4220	0.6270
318.75	0.0320	0.0790	321.50	0.4840	0.6720
318.20	0.0430	0.1120	320.75	0.5320	0.7060
317.55	0.0600	0.1460	320.15	0.5710	0.7330
316.35	0.0930	0.2170	319.00	0.6450	0.7850
315.60	0.1140	0.2530	318.00	0.7080	0.8260
314.65	0.1380	0.3010	317.00	0.7810	0.8720
314.20	0.1540	0.3270	316.20	0.8380	0.9080
313.40	0.1800	0.3650	315.45	0.8920	0.9380
312.65	0.2020	0.4000	315.00	0.9310	0.9620
312.15	0.2200	0.4250	314.55	0.9660	0.9800
311.55	0.2460	0.4580	Engelmann, K. - Bittrich, H.J., Isobaric liquid-vapor equilibriums of the systems diethylamine/ethyl acetate, diethylamine/1,4-dioxane, and ethyl acetate/1,4-dioxane at 760 mm, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 148-153.		
310.75	0.2720	0.4920	P / bar = 1.013		
309.95	0.3090	0.5320	T / K	x ₁	y ₁
308.90	0.3520	0.5810	348.25	0.0450	0.1080
308.10	0.3930	0.6190	346.20	0.0880	0.1920
306.95	0.4570	0.6660	345.25	0.1180	0.2420
306.25	0.5060	0.7020	344.60	0.1380	0.2810
305.30	0.5650	0.7420	343.75	0.1620	0.3120
304.70	0.6100	0.7740	342.20	0.2170	0.3820
303.90	0.6650	0.8090	340.60	0.2810	0.4650
303.30	0.7110	0.8360	339.80	0.3030	0.4960
302.85	0.7440	0.8570	339.35	0.3330	0.5300
301.95	0.8150	0.9000	339.30	0.3270	0.5210
301.15	0.8820	0.9370	338.95	0.3460	0.5410
300.45	0.9410	0.9690	338.45	0.3670	0.5600
Engelmann, K. - Bittrich, H.J., Isobaric liquid-vapor equilibriums of the system diethylamine-ethyl acetate, diethylamine-1,4-dioxane and ethyl acetate-1,4-dioxane at reduced pressures, Wiss. Z. Tech. Hochsch. Chem. Leuna-Merseburg. 8 (1966) 289-291.			337.40	0.4130	0.6090
P / bar = 0.5999			336.85	0.4400	0.6300
T / K	x ₁	y ₁	336.20	0.4710	0.6590
334.65	0.0080	0.0270	335.80	0.5040	0.6780
334.25	0.0160	0.0490	335.25	0.5380	0.7030
333.80	0.0260	0.0760	334.55	0.5730	0.7230
333.25	0.0380	0.1080	334.05	0.6180	0.7550
332.65	0.0520	0.1420	333.60	0.6290	0.7600
331.35	0.0860	0.2080	332.80	0.6880	0.8000
330.30	0.1140	0.2620	332.35	0.7130	0.8210
			332.00	0.7360	0.8330
			331.35	0.7770	0.8640
			331.00	0.8110	0.8830

SA-HA systems (BAC = 8)

330.35	0.8460	0.9050
330.20	0.8710	0.9230
329.60	0.9150	0.9490
329.15	0.9490	0.9680
328.85	0.9620	0.9750

SA-HA systems (BAC = 8)



DIETHYLAMINE (1) + TRIETHYLAMINE (2)

CAS	109-89-7	121-44-8
InChiKey	HPNMFZURTQLUMO-UHFFFAOYSA-N	ZMANZCXQJIPKH-UHFFFAOYSA-N
T_c / K	496.60	535.15
P_c / bar	37.10	30.40
ω	0.304	0.316

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 6.399$$

$$B/\text{MPa} = 24.62$$

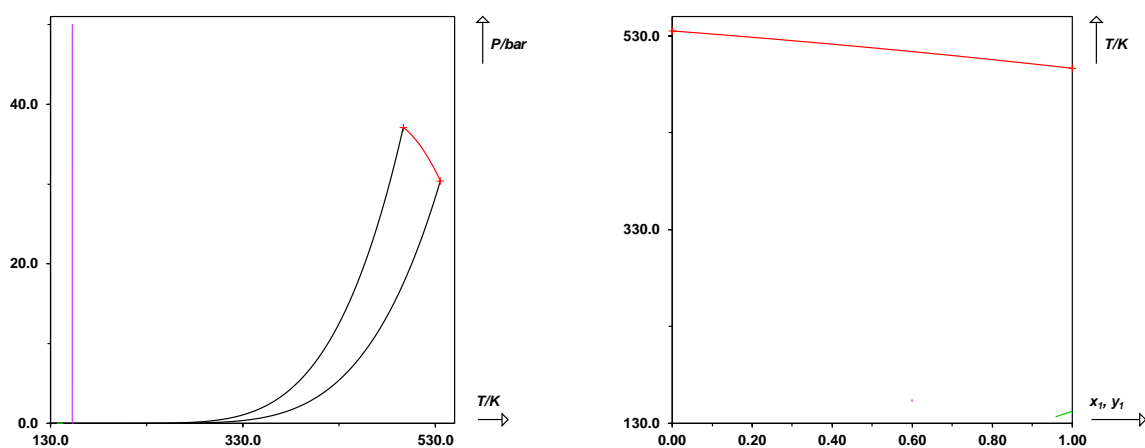
Deviations

$$\text{MAPE on } x = 5.1 \%$$

$$\text{MAPE on } y = 5.8 \%$$

$$\text{MAPE on } h^M = 18 \%$$

$$\text{MAPE on } c_p^M = 200 \%$$



-----			0.7159	0.4000	0.6695
Isothermal phase equilibrium data			0.7939	0.5000	0.7515
-----			0.8726	0.6000	0.8181
Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.			0.9506	0.7000	0.8742
T / K =	323.15		1.027	0.8000	0.9219
P / bar	x_1	y_1	1.104	0.9000	0.9629
0.2773	0.0200	0.0813	1.142	0.9500	0.9822
0.3013	0.0500	0.1801	1.163	0.9800	0.9920
0.3333	0.1000	0.2937	Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.		
0.3900	0.2000	0.4571	T / K = 338.15		
0.4460	0.3000	0.5799	P / bar	x_1	y_1
0.5013	0.4000	0.6792	0.4940	0.0200	0.0720
0.5580	0.5000	0.7569	0.5266	0.0500	0.1546
0.6133	0.6000	0.8235	0.5733	0.1000	0.2608
0.6700	0.7000	0.8773	0.6666	0.2000	0.4318
0.7253	0.8000	0.9244	0.7593	0.3000	0.5613
0.7813	0.9000	0.9640	0.8506	0.4000	0.6630
0.8086	0.9500	0.9824	0.9413	0.5000	0.7456
0.8253	0.9800	0.9917	1.033	0.6000	0.8135
Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.			1.123	0.7000	0.8709
T / K =	328.15		1.212	0.8000	0.9193
P / bar	x_1	y_1	1.301	0.9000	0.9606
0.3360	0.0200	0.0775	1.343	0.9500	0.9803
0.3640	0.0500	0.1723	1.367	0.9800	0.9920
0.4026	0.1000	0.2865	Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.		
0.4693	0.2000	0.4523	T / K = 343.15		
0.5360	0.3000	0.5768	P / bar	x_1	y_1
0.6040	0.4000	0.6747	0.5840	0.0200	0.0696
0.6706	0.5000	0.7543	0.6226	0.0500	0.1531
0.7379	0.6000	0.8194	0.6799	0.1000	0.2613
0.8033	0.7000	0.8758	0.7873	0.2000	0.4307
0.8693	0.8000	0.9222	0.8959	0.3000	0.5587
0.9346	0.9000	0.9627	1.003	0.4000	0.6611
0.9659	0.9500	0.9811	1.109	0.5000	0.7438
0.9839	0.9800	0.9917	1.216	0.6000	0.8125
Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.			1.323	0.7000	0.8696
T / K =	333.15		1.427	0.8000	0.9201
P / bar	x_1	y_1	1.533	0.9000	0.9621
0.4073	0.0200	0.0731	1.585	0.9500	0.9816
0.4386	0.0500	0.1625	1.612	0.9800	0.9918
0.4813	0.1000	0.2726			
0.5586	0.2000	0.4415			
0.6386	0.3000	0.5668			

Isobaric phase equilibrium data

Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.

P / bar = 0.4666

T / K	x ₁	y ₁
336.35	0.0230	0.0680
334.65	0.0520	0.1500
332.45	0.0940	0.2600
329.65	0.1570	0.3820
323.65	0.3220	0.6040
319.40	0.4660	0.7270
315.85	0.5940	0.8220
310.85	0.8310	0.9380
308.70	0.9350	0.9780

Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.

P / bar = 0.7999

T / K	x ₁	y ₁
352.85	0.0210	0.0450
350.70	0.0600	0.1480
348.15	0.1000	0.2670
343.05	0.2180	0.4540
339.40	0.3230	0.5740
336.85	0.3860	0.6510
329.15	0.6550	0.8480
324.75	0.8510	0.9430
322.45	0.9630	0.9850

Bittrich, H.J. - Kauer, E., Thermodynamics of the system diethylamine-triethylamine. I. The liquid-vapor equilibrium, Z. Phys. Chem. Leipzig. 219 (1962) 224-238.

P / bar = 1.013

T / K	x ₁	y ₁
360.50	0.0200	0.0420
358.35	0.0520	0.1240
357.55	0.0650	0.1530
356.32	0.0900	0.2250
356.00	0.0920	0.2430
353.65	0.1400	0.3160
350.30	0.2150	0.4490
342.45	0.4300	0.6780
337.45	0.6010	0.8020
333.00	0.7820	0.9100
331.35	0.8530	0.9480
329.85	0.9320	0.9700
328.90	0.9850	0.9930

Enthalpy of mixing

Bittrich, H.J. - Kulanek, M. - Duering, G., Thermodynamics of the system diethylamine-triethylamine. Enthalpies of mixing at 14, 18, and 25°, Z. Phys. Chem. Leipzig. 219 (1962) 387-395.

T / K = 287.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
103.00	0.1000
152.00	0.2000
205.00	0.3000
258.00	0.4000
281.00	0.5000
260.00	0.6000
209.00	0.7000
160.00	0.8000
96.00	0.9000

Ratkovics, F. - Liszi, J. - Laszlo-Parragi, M. - Szeiler, B. - Devay, J., Mixing properties of the ethanol-diethylamine-triethylamine system, Acta Chim. Acad. Sci. Hung. 77 (1973) 249-265.

T / K = 293.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
113.88	0.0840
248.28	0.2070
356.72	0.3440
385.60	0.4730
356.72	0.6240
293.49	0.7520
235.72	0.8190
148.63	0.9010
72.01	0.9540

Bittrich, H.J. - Kulanek, M. - Duering, G., Thermodynamics of the system diethylamine-triethylamine. Enthalpies of mixing at 14, 18, and 25°, Z. Phys. Chem. Leipzig. 219 (1962) 387-395.

T / K = 298.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
151.00	0.1000
216.00	0.2000
267.00	0.3000
325.00	0.4000
360.00	0.5000
332.00	0.6000

281.00	0.7000	0.6045	0.0750
210.00	0.8000	1.430	0.2140
139.00	0.9000	2.190	0.4320
-----		2.165	0.4990
Heat capacity of mixing		1.500	0.7840
-----		1.035	0.8940

Kauer, E. - Grote, L. - Bittrich, H.- J., Zur Thermodynamik des Systems Diäthylamin-Triäthylamin. IV, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23231

T / K = 293.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

1.623 0.0800

2.336 0.1810

4.260 0.5780

2.558 0.8030

1.511 0.9070

Kauer, E. - Grote, L. - Bittrich, H.- J., Zur Thermodynamik des Systems Diäthylamin-Triäthylamin. IV, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23231

T / K = 303.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

2.926 0.1560

4.385 0.5580

2.888 0.8030

1.326 0.9070

Kauer, E. - Grote, L. - Bittrich, H.- J., Zur Thermodynamik des Systems Diäthylamin-Triäthylamin. IV, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23231

T / K = 313.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

1.705 0.1390

3.503 0.4920

3.636 0.5310

2.283 0.7890

1.377 0.9040

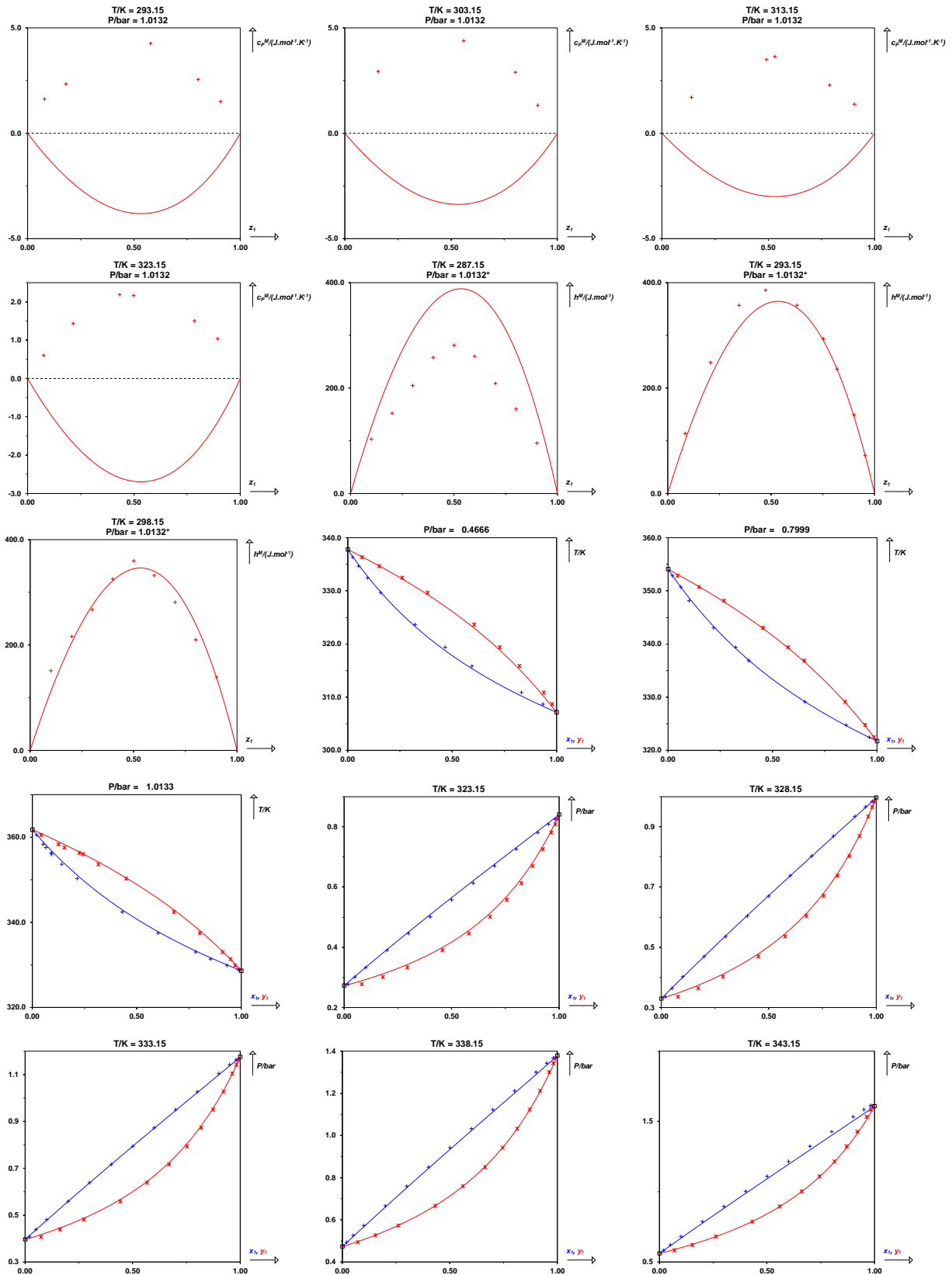
Kauer, E. - Grote, L. - Bittrich, H.- J., Zur Thermodynamik des Systems Diäthylamin-Triäthylamin. IV, Zeitschrift für Physikalische Chemie. 232O (1966) doi:10.1515/zpch-1966-23231

T / K = 323.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

SA-HA systems (BAC = 8)



CARBON DIOXIDE (1) + 2-METHYL-1-PROPANOL (2)

CAS	124-38-9	78-83-1
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	ZXEKIIBDNHEJCC-UHFFFAOYSA-N
T_c / K	304.21	547.80
P_c / bar	73.83	42.95
ω	0.224	0.586

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 187.9$$

$$B/\text{MPa} = 408.8$$

Deviations

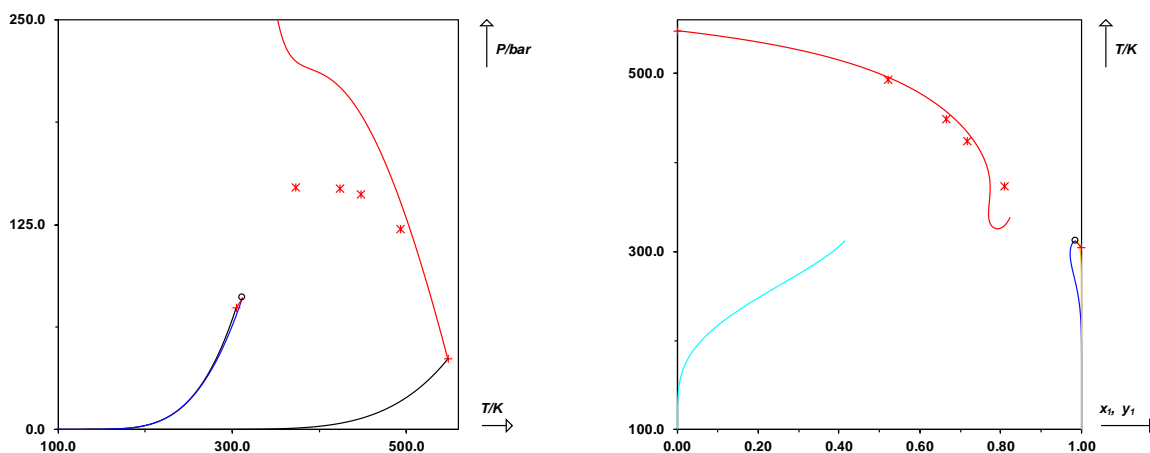
$$\text{MAPE on } x = 28 \%$$

$$\text{MAPE on } y = 18 \%$$

$$\text{MAPE on } x_c = 6.0 \%$$

$$\text{MAPE on } P_c = 36 \%$$

$$\text{MAPE on } h^M = 47 \%$$



-----			39.00	0.2130	0.9790
Isothermal phase equilibrium data			50.20	0.2970	0.9750
-----			56.60	0.3390	0.9830
da Silva, Marta Vázquez - Barbosa, Domingos, High pressure vapor-liquid equilibrium data for the systems carbon dioxide/2-methyl-1-propanol and carbon dioxide/3-methyl-1-butanol at 288.2, 303.2 and 313.2 K, Fluid Phase Equilibria. 198 (2002) 229-237. doi:10.1016/S0378-3812(01)00766-X			68.80	0.4370	0.9900
T / K = 288.20			73.40	0.4860	0.9930
P / bar	x ₁	y ₁	78.50	0.5590	0.9900
40.20	0.5500	0.9950	83.10	0.6270	0.9910
34.70	0.4530	0.9940	85.40	0.6780	0.9890
31.50	0.3680	0.9930	87.80	0.7210	0.9880
26.70	0.3080	0.9950	89.10	0.7540	0.9870
21.00	0.2340	0.9910	90.70	0.7940	0.9850
Yun, Z. - Shi, M. - Shi, J., High Pressure Vapor-Liquid Phase Equilibrium For Carbon Dioxide-n-Butanol And Carbon Dioxide-i-Butanol, Ranliao Huaxue Xuebao. 24 (1996) 87-92.					
T / K = 298.20					
P / bar	x ₁	y ₁			
46.00	0.4190	0.9881			
52.50	0.6292	0.9883			
59.00	0.8900	0.9901			
Gutiérrez, Jorge E. - Bejarano, Arturo - Fuente, Juan C. de la, Measurement and modeling of high-pressure (vapour+liquid) equilibria of (CO ₂ +alcohol) binary systems, The Journal of Chemical Thermodynamics. 42 (2010) 591-596. doi:10.1016/j.jct.2009.11.015					
T / K = 313.00					
P / bar	x ₁	y ₁			
21.10	0.1230	0.9710			
30.90	0.1940	0.9800			
35.60	0.2350	0.9900			
44.00	0.2890	0.9850			
53.40	0.3670	0.9810			
63.90	0.5060	0.9890			
71.00	0.6210	0.9910			
74.40	0.7250	0.9920			
Gutiérrez, Jorge E. - Bejarano, Arturo - Fuente, Juan C. de la, Measurement and modeling of high-pressure (vapour+liquid) equilibria of (CO ₂ +alcohol) binary systems, The Journal of Chemical Thermodynamics. 42 (2010) 591-596. doi:10.1016/j.jct.2009.11.015					
T / K = 323.00					
P / bar	x ₁	y ₁			
23.20	0.1120	0.9610			
30.20	0.1540	0.9730			
Yun, Z. - Shi, M. - Shi, J., High Pressure Vapor-Liquid Phase Equilibrium For Carbon Dioxide-n-Butanol And Carbon Dioxide-i-Butanol, Ranliao Huaxue Xuebao. 24 (1996) 87-92.					
T / K = 328.20					
P / bar	x ₁	y ₁			
5.300	0.0286	0.7957			
12.40	0.0594	0.9116			
21.40	0.1018	0.9430			
29.70	0.1448	0.9700			
38.30	0.1987	0.9784			
47.30	0.2524	0.9779			
57.20	0.3219	0.9775			
66.60	0.4023	0.9820			
74.90	0.4789	0.9854			
83.30	0.5797	0.9844			
90.00	0.6733	0.9818			
95.20	0.7662	0.9793			
98.20	0.8409	0.9735			
99.40	0.8733	0.9684			
Gutiérrez, Jorge E. - Bejarano, Arturo - Fuente, Juan C. de la, Measurement and modeling of high-pressure (vapour+liquid) equilibria of (CO ₂ +alcohol) binary systems, The Journal of Chemical Thermodynamics. 42 (2010) 591-596. doi:10.1016/j.jct.2009.11.015					
T / K = 333.00					
P / bar	x ₁	y ₁			
22.10	0.0940	0.9790			
31.00	0.1410	0.9800			
40.20	0.1870	0.9870			
51.20	0.2670	0.9850			
60.30	0.3260	0.9870			
99.20	0.7000	0.9880			
105.60	0.7790	0.9820			
107.90	0.8360	0.9640			
Chen, Huey-Ing - Chen, Po-Hung - Chang, Hung-Yi, High-Pressure Vapor-Liquid Equilibria for CO ₂ + 2-Butanol, CO ₂					

+ Isobutanol, and CO₂ + tert-Butanol Systems, Journal of Chemical & Engineering Data. 48 (2003) 1407-1412. doi:10.1021/je020214r

T / K = 341.60

P / bar	x ₁	y ₁
50.10	0.2481	0.9929
60.80	0.3027	0.9862
69.60	0.3551	0.9844
80.20	0.4189	0.9839
89.90	0.4805	0.9806
99.70	0.5625	0.9767
110.40	0.6640	0.9763
120.10	0.7443	0.9602

Chen, Huey-Ing - Chen, Po-Hung - Chang, Hung-Yi, High-Pressure Vapor-Liquid Equilibria for CO₂ + 2-Butanol, CO₂ + Isobutanol, and CO₂ + tert-Butanol Systems, Journal of Chemical & Engineering Data. 48 (2003) 1407-1412. doi:10.1021/je020214r

T / K = 351.30

P / bar	x ₁	y ₁
50.10	0.2369	0.9853
60.80	0.2838	0.9818
69.60	0.3310	0.9793
80.20	0.3888	0.9787
89.90	0.4421	0.9764
99.70	0.4997	0.9703
110.40	0.5642	0.9658
120.10	0.6290	0.9650

Semenova, A.I. - Emel'yanova, E.A. - Tsimmerman, S.S. - Tsiklis, D.S., Phase equilibria in the isobutyl alcohol-carbon dioxide system, Russ. J. Phys. Chem. 52 (1978) 1149-1152.

T / K = 373.15

P / bar	x ₁	y ₁	
5.000	0.0180	0.8460	
10.00	0.0380	0.9060	
20.00	0.0810	0.9520	
30.00	0.1240	0.9730	
40.00	0.1660	0.9760	
50.00	0.2080	0.9750	
120.00	0.5220	0.9730	
130.00	0.5800	0.9680	
140.00	0.6470	0.9300	
147.40	0.8100	0.8100	CRIT

Semenova, A.I. - Emel'yanova, E.A. - Tsimmerman, S.S. - Tsiklis, D.S., Phase equilibria in the isobutyl alcohol-carbon dioxide system, Russ. J. Phys. Chem. 52 (1978) 1149-1152.

T / K = 423.15

P / bar	x ₁	y ₁	
10.00	0.0210	0.6180	
20.00	0.0580	0.7710	
30.00	0.0960	0.8420	
40.00	0.1340	0.8740	
50.00	0.1720	0.8860	
60.00	0.2090	0.8910	
70.00	0.2470	0.8970	
80.00	0.2860	0.8980	
90.00	0.3260	0.9000	
100.00	0.3640	0.8980	
110.00	0.4020	0.8960	
120.00	0.4400	0.8930	
130.00	0.4890	0.8740	
140.00	0.5770	0.8320	
147.00	0.7160	0.7160	CRIT

Semenova, A.I. - Emel'yanova, E.A. - Tsimmerman, S.S. - Tsiklis, D.S., Phase equilibria in the isobutyl alcohol-carbon dioxide system, Russ. J. Phys. Chem. 52 (1978) 1149-1152.

T / K = 448.15

P / bar	x ₁	y ₁	
10.00	0.0030	0.3450	
20.00	0.0420	0.6180	
30.00	0.0760	0.7180	
40.00	0.1110	0.7640	
50.00	0.1470	0.7860	
60.00	0.1820	0.8010	
70.00	0.2170	0.8080	
80.00	0.2520	0.8120	
90.00	0.2890	0.8170	
100.00	0.3260	0.8210	
110.00	0.3660	0.8270	
120.00	0.4070	0.8320	
130.00	0.4570	0.8150	
140.00	0.5400	0.7470	
143.60	0.6640	0.6640	CRIT

Semenova, A.I. - Emel'yanova, E.A. - Tsimmerman, S.S. - Tsiklis, D.S., Phase equilibria in the isobutyl alcohol-carbon dioxide system, Russ. J. Phys. Chem. 52 (1978) 1149-1152.

T / K = 493.15

P / bar	x ₁	y ₁
30.00	0.0230	0.4960
40.00	0.0630	0.5940
50.00	0.1010	0.6360
60.00	0.1400	0.6660
70.00	0.1780	0.6920
80.00	0.2180	0.7050

SA-HA systems (BAC = 8)

110.00	0.3490	0.6920		-58.00	0.3653
120.00	0.4550	0.6130		-122.00	0.4253
122.00	0.5200	0.5200	CRIT	-194.00	0.4818

Enthalpy of mixing

Ochi, Kenji - Dai, Wenbin - Wada, Yutaka - Hayashi, Hiroyuki - Kurihara, Kiyofumi - Kojima, Kazuo, Measurement and correlation of excess molar enthalpies for the systems containing supercritical carbon dioxide and alcohols, Fluid Phase Equilibria. 194-197 (2002) 919-928. doi:10.1016/S0378-3812(01)00704-X

T / K = 308.15

P / bar = 75.00

$h^M / \text{J.mol}^{-1}$ z_1

-113.00	0.0825
-281.00	0.1596
-444.00	0.2317
-691.00	0.2993
-953.00	0.3629
-1308.0	0.4227
-1686.0	0.4792
-2030.0	0.5325
-2351.0	0.5830
-2718.0	0.6308
-2992.0	0.6762
-3306.0	0.7193
-3566.0	0.7604
-3804.0	0.7995
-4034.0	0.8368
-4212.0	0.8724
-4362.0	0.9064
-4091.0	0.9389
-2110.0	0.9701

Ochi, Kenji - Dai, Wenbin - Wada, Yutaka - Hayashi, Hiroyuki - Kurihara, Kiyofumi - Kojima, Kazuo, Measurement and correlation of excess molar enthalpies for the systems containing supercritical carbon dioxide and alcohols, Fluid Phase Equilibria. 194-197 (2002) 919-928. doi:10.1016/S0378-3812(01)00704-X

T / K = 308.15

P / bar = 80.00

$h^M / \text{J.mol}^{-1}$ z_1

19.00	0.0424
34.00	0.0833
39.00	0.1228
32.00	0.1610
18.00	0.2335
-18.00	0.3015

-278.00	0.5351
-370.00	0.5855
-472.00	0.6333
-586.00	0.6785
-706.00	0.7214
-815.00	0.7623
-925.00	0.8011
-1039.0	0.8382
-1148.0	0.8735
-1183.0	0.9073
-1198.0	0.9395
-932.00	0.9704
-487.00	0.9854

Ochi, Kenji - Dai, Wenbin - Wada, Yutaka - Hayashi, Hiroyuki - Kurihara, Kiyofumi - Kojima, Kazuo, Measurement and correlation of excess molar enthalpies for the systems containing supercritical carbon dioxide and alcohols, Fluid Phase Equilibria. 194-197 (2002) 919-928. doi:10.1016/S0378-3812(01)00704-X

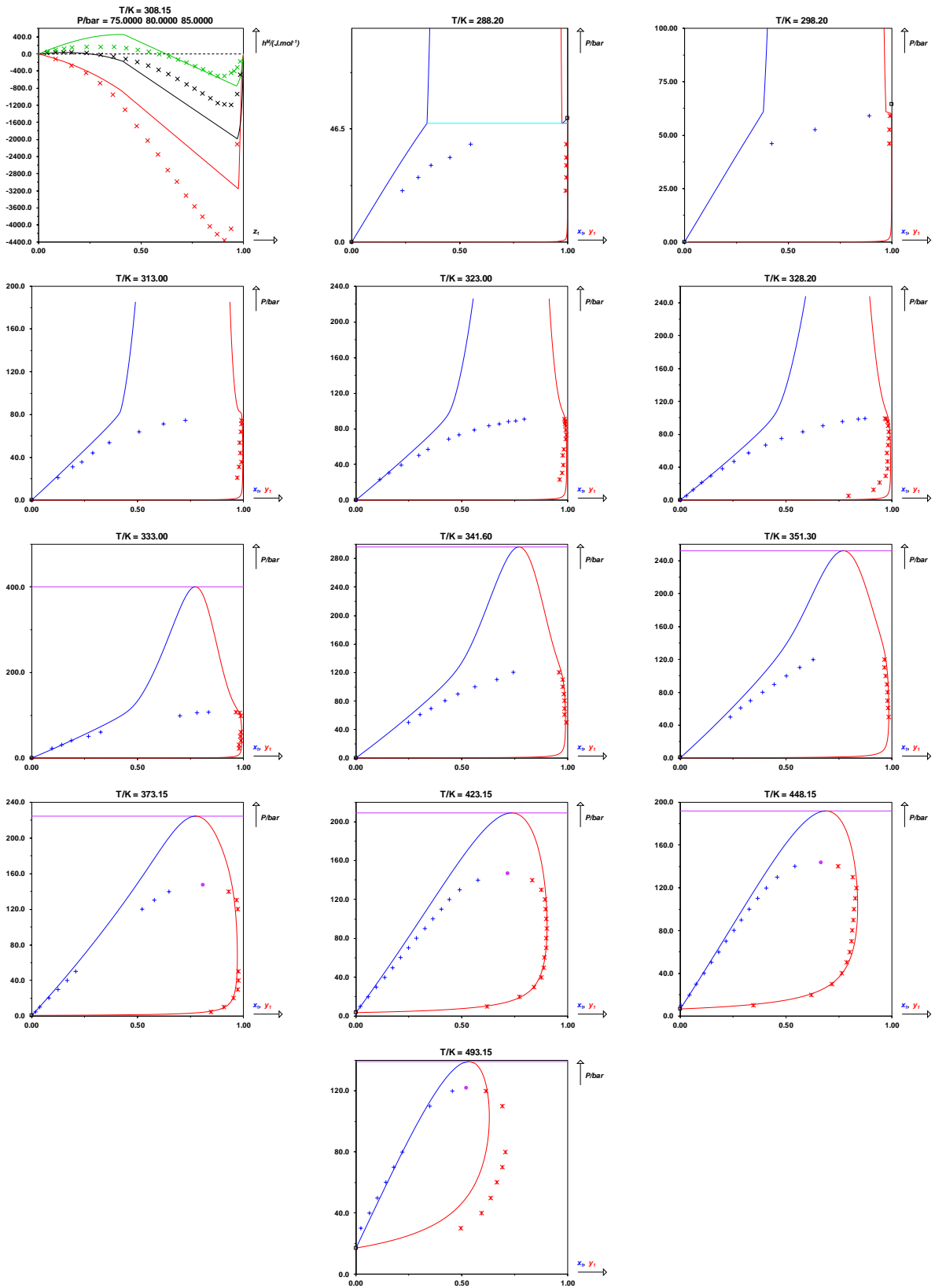
T / K = 308.15

P / bar = 85.00

$h^M / \text{J.mol}^{-1}$ z_1

45.00	0.0428
87.00	0.0840
122.00	0.1238
144.00	0.1622
165.00	0.2352
169.00	0.3035
165.00	0.3675
132.00	0.4275
96.00	0.4841
49.00	0.5374
-10.00	0.5878
-66.00	0.6354
-132.00	0.6805
-200.00	0.7233
-288.00	0.7640
-360.00	0.8026
-441.00	0.8394
-515.00	0.8745
-513.00	0.9080
-448.00	0.9401
-400.00	0.9555
-317.00	0.9707
-173.00	0.9855

SA-HA systems (BAC = 8)



METHYL tert-BUTYL ETHER (1) + 2-METHYL-2-PROPANOL (2)

CAS	1634-04-4	75-65-0
InChiKey	BZLVMXJERCGZMT-UHFFFAOYSA-N	DKGAVHZHDRPRBM-UHFFFAOYSA-N
T_c / K	497.10	506.20
P_c / bar	32.86	39.72
ω	0.247	0.615

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

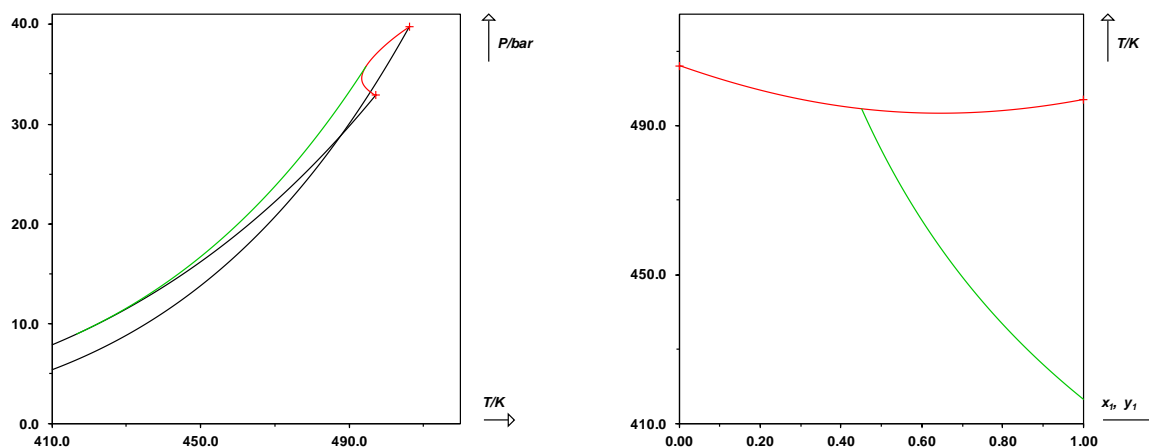
$$A/\text{MPa} = 17.11$$

$$B/\text{MPa} = -7.716$$

Deviations

$$\text{MAPE on } x = 9.0 \%$$

$$\text{MAPE on } y = 8.4 \%$$



Isothermal phase equilibrium data			

		0.6930	0.1417 0.3835
		0.7643	0.1976 0.4746
		0.8369	0.2566 0.5498
		0.9137	0.3266 0.6203
		0.9963	0.4101 0.6869
		1.050	0.4733 0.7258

Fuangfoo, Surajit - Kersting, Mark - Viswanath, Dabir S., Isothermal Vapor-Liquid Equilibria for Methyl-2,2-dimethylethyl Ether + 2-Methylpropan-2-ol, Diethyl Ether + Ethyl-2,2-dimethylethyl Ether, 2-Methyl-2-butene + (2-Methylbutan-2-ol), and Diisopropyl Ether + Octane, Journal of Chemical & Engineering Data. 44 (1999) 405-410. doi:10.1021/jc980248s

T / K = 313.15			
P / bar	x ₁	y ₁	
0.1504	0.0223	0.1035	
0.2180	0.1554	0.4552	
0.3018	0.3275	0.6728	
0.3953	0.5253	0.8265	
0.4813	0.7168	0.9139	
0.5361	0.8419	0.9493	
0.5606	0.9014	0.9692	

Bernatová, Svatoslava - Wichterle, Ivan, Isothermal vapour-liquid equilibria in the ternary system tert-butyl methyl ether + tert-butanol + 2,2,4-trimethylpentane and the three binary subsystems, Fluid Phase Equilibria. 180 (2001) 235-245. doi:10.1016/S0378-3812(01)00349-1

T / K = 328.20			
P / bar	x ₁	y ₁	
0.3741	0.0630	0.2336	
0.4089	0.0925	0.3191	
0.4488	0.1279	0.3972	
0.5054	0.1830	0.5004	
0.5622	0.2438	0.5779	
0.6235	0.3113	0.6474	
0.6852	0.3921	0.7074	
0.7468	0.4813	0.7625	
0.7888	0.5471	0.7965	
0.8416	0.6385	0.8365	
0.8961	0.7428	0.8798	
0.9426	0.8401	0.9207	
0.9772	0.9123	0.9535	
0.9976	0.9587	0.9772	
1.011	0.9886	0.9936	

Bernatová, Svatoslava - Wichterle, Ivan, Isothermal vapour-liquid equilibria in the ternary system tert-butyl methyl ether + tert-butanol + 2,2,4-trimethylpentane and the three binary subsystems, Fluid Phase Equilibria. 180 (2001) 235-245. doi:10.1016/S0378-3812(01)00349-1

T / K = 339.28			
P / bar	x ₁	y ₁	
0.5913	0.0695	0.2241	
0.6275	0.0953	0.2870	

Isobaric phase equilibrium data			

Isobaric phase equilibrium data

Loras, Sonia - Aucejo, Antonio - Muñoz, Rosa, Isobaric Vapor-Liquid Equilibrium in the Systems Methyl 1,1-Dimethylethyl Ether + 2-Methyl-2-propanol and Methyl 1,1-Dimethylethyl Ether + 2-Methylpentane + 2-Methyl-2-propanol, Journal of Chemical & Engineering Data. 44 (1999) 1169-1174. doi:10.1021/jc990095o

P / bar = 1.013			
T / K	x ₁	y ₁	
354.05	0.0280	0.0860	
352.45	0.0590	0.1700	
350.05	0.1070	0.2900	
347.85	0.1560	0.3900	
345.85	0.2060	0.4760	
343.75	0.2600	0.5390	
341.95	0.3110	0.6060	
340.45	0.3590	0.6540	
339.15	0.4050	0.6920	
338.15	0.4390	0.7190	
336.95	0.4880	0.7540	
335.85	0.5380	0.7830	
334.75	0.5870	0.8090	
333.85	0.6370	0.8320	
332.75	0.6880	0.8560	
331.95	0.7430	0.8800	
331.15	0.7930	0.9020	
330.25	0.8460	0.9260	
329.55	0.8980	0.9490	
328.75	0.9490	0.9730	
328.45	0.9800	0.9890	

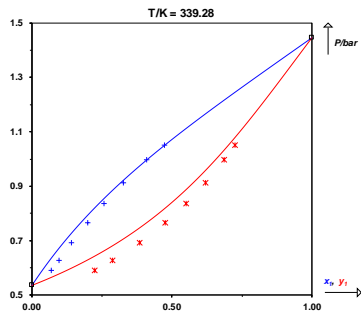
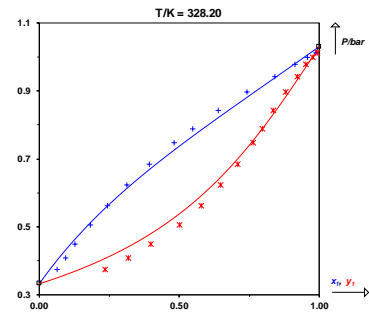
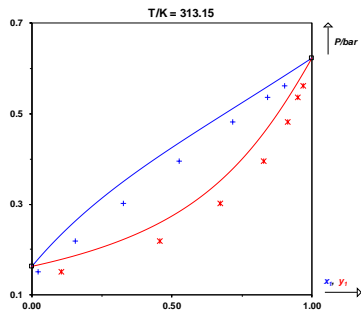
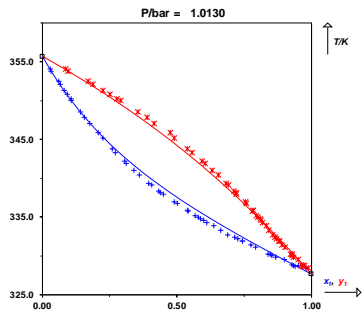
Hiaki, Toshihiko - Tatsuhana, Kazuteru - Tsuji, Tomoya - Hongo, Masaru, Vapor-liquid equilibria for binary and ternary systems composed of 2-methoxy-2-methyl propane, 2-methyl-2-propanol, and octane at 101.3 kPa, Fluid Phase Equilibria. 156 (1999) 161-171. doi:10.1016/S0378-3812(99)00026-6

P / bar = 1.013			
T / K	x ₁	y ₁	
353.82	0.0320	0.0953	
352.07	0.0669	0.1858	
351.34	0.0806	0.2237	

SA-HA systems (BAC = 8)

350.81	0.0923	0.2497
350.23	0.1055	0.2767
348.49	0.1417	0.3546
347.09	0.1751	0.4139
345.14	0.2230	0.4905
343.33	0.2713	0.5566
342.24	0.3048	0.5944
341.06	0.3404	0.6308
339.33	0.3957	0.6834
338.38	0.4329	0.7104
337.95	0.4480	0.7211
336.72	0.5003	0.7574
335.78	0.5410	0.7798
335.22	0.5678	0.7950
334.95	0.5797	0.8017
334.56	0.5993	0.8111
334.31	0.6111	0.8168
333.32	0.6622	0.8420
332.41	0.7155	0.8634
332.24	0.7269	0.8687
331.90	0.7417	0.8774
331.45	0.7751	0.8906
330.24	0.8388	0.9212
330.02	0.8527	0.9278
329.80	0.8666	0.9336
328.84	0.9276	0.9629
328.73	0.9338	0.9661
328.65	0.9399	0.9687

SA-HA systems (BAC = 8)



CARBON DIOXIDE (1) + 1-PENTANOL (2)

CAS	124-38-9	71-41-0
InChiKey	CURLTUGMZLYLDI-UHFFFAOYSA-N	AMQJEAYHLZJPGS-UHFFFAOYSA-N
T_c / K	304.21	588.10
P_c / bar	73.83	38.97
ω	0.224	0.575

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = 100.7$

$B/\text{MPa} = 219.2$

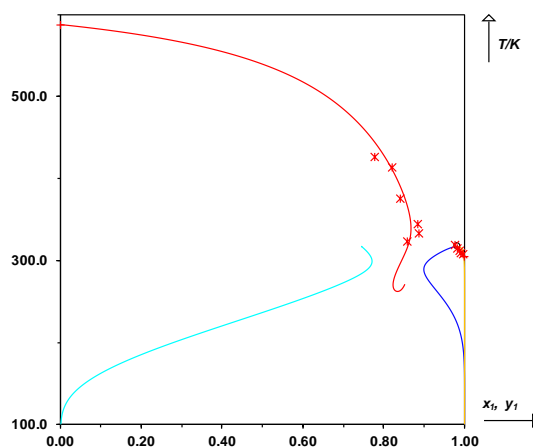
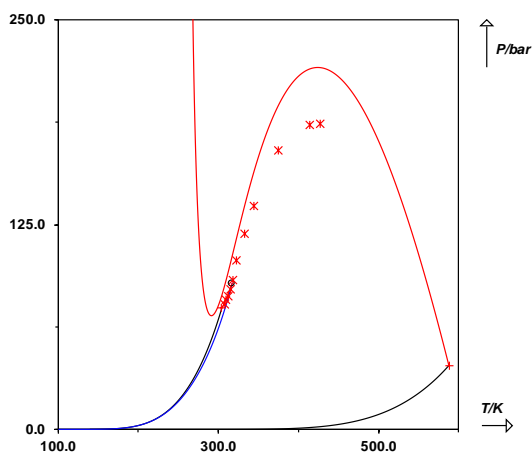
Deviations

MAPE on $x = 16\%$

MAPE on $y = 24\%$

MAPE on $x_c = 41\%$

MAPE on $P_c = 16\%$



Isothermal phase equilibrium data

Secuianu, Catinca - Feroiu, Viorel - Geană, Dan, Measurements and Modeling of High-Pressure Phase Behavior of the Carbon Dioxide + Pentan-1-ol Binary System, Journal of Chemical & Engineering Data. 56 (2011) 5000-5007. doi:10.1021/je200867n

T / K = 293.15

P / bar	x ₁	y ₁
5.200	0.0358	0.9924
9.800	0.0738	0.9960
19.70	0.1572	0.9986
29.20	0.2486	0.9989
42.00	0.3832	0.9988
47.40	0.4583	0.9988
52.30	0.5960	0.9986
54.20	0.7457	0.9980
54.50	0.7641	0.9980

Secuianu, Catinca - Feroiu, Viorel - Geană, Dan, High-Pressure Vapour-Liquid Equilibria of Carbon Dioxide + I-Pentanol System. Experimental Measurements and Modelling, Revista de Chimie-Bucharest. 58 (2007) 1176-1181.

T / K = 313.15

P / bar	x ₁	y ₁
5.900	0.0400	0.9937
17.50	0.1230	0.9970
30.70	0.2060	0.9982
39.80	0.2660	0.9985
51.60	0.3540	0.9985
63.50	0.4510	0.9984
70.20	0.5180	0.9979

Gutiérrez, Jorge E. - Bejarano, Arturo - Fuente, Juan C. de la, Measurement and modeling of high-pressure (vapour+liquid) equilibria of (CO₂+alcohol) binary systems, The Journal of Chemical Thermodynamics. 42 (2010) 591-596. doi:10.1016/j.jct.2009.11.015

T / K = 313.15

P / bar	x ₁	y ₁
18.10	0.1040	0.9770
30.00	0.1870	0.9810
40.90	0.2630	0.9820
52.70	0.3400	0.9850
62.90	0.4230	0.9920
67.50	0.4770	0.9920
76.00	0.5700	0.9930
81.50	0.6830	0.9980
83.90	0.7600	0.9950

Secuianu, Catinca - Feroiu, Viorel - Geană, Dan, Measurements and Modeling of High-Pressure Phase Behavior of the Carbon Dioxide + Pentan-1-ol Binary System, Journal of Chemical & Engineering Data. 56 (2011) 5000-5007. doi:10.1021/je200867n

T / K = 333.15

P / bar	x ₁	y ₁
5.900	0.0383	0.9889
14.10	0.0725	0.9905
26.50	0.1388	0.9926
33.80	0.1820	0.9935
45.50	0.2365	0.9931
58.80	0.3144	0.9932
73.40	0.3927	0.9919
84.80	0.4638	0.9903
97.50	0.5507	0.9875
106.70	0.6208	0.9836

Gutiérrez, Jorge E. - Bejarano, Arturo - Fuente, Juan C. de la, Measurement and modeling of high-pressure (vapour+liquid) equilibria of (CO₂+alcohol) binary systems, The Journal of Chemical Thermodynamics. 42 (2010) 591-596. doi:10.1016/j.jct.2009.11.015

T / K = 333.15

P / bar	x ₁	y ₁
24.00	0.1020	0.9680
33.70	0.1590	0.9750
42.60	0.2110	0.9830
53.00	0.2610	0.9870
63.20	0.3330	0.9890
72.90	0.3850	0.9920
78.10	0.4200	0.9910
91.80	0.5150	0.9930
102.90	0.6110	0.9930
112.10	0.7030	0.9940
117.20	0.7440	0.9890

Secuianu, Catinca - Feroiu, Viorel - Geană, Dan, High-Pressure Vapour-Liquid Equilibria of Carbon Dioxide + I-Pentanol System. Experimental Measurements and Modelling, Revista de Chimie-Bucharest. 58 (2007) 1176-1181.

T / K = 353.15

P / bar	x ₁	y ₁
8.300	0.0351	0.9889
20.10	0.0834	0.9924
30.30	0.1292	0.9930
39.90	0.1744	0.9932
49.90	0.2152	0.9929
60.00	0.2513	0.9924
70.10	0.2989	0.9921
80.10	0.3466	0.9910

SA-HA systems (BAC = 8)

90.00	0.3968	0.9900	343.69	136.09	0.8850
100.00	0.4477	0.9885	374.93	170.34	0.8401
112.20	0.4950	0.9866	414.23	186.10	0.8198
			426.86	186.65	0.7765

Staby, Arne - Mollerup, Jørgen, Measurement of mutual solubilities of 1-Pentanol and supercritical carbon dioxide, The Journal of Supercritical Fluids. 6 (1993) 15-19. doi:10.1016/0896-8446(93)90005-1

T / K = 373.15

P / bar	x_1	y_1
25.00	0.0875	0.9926
25.00	0.0917	0.9942
65.00	0.2459	0.9904
100.00	0.3938	0.9866
100.00	0.3975	0.9880
125.00	0.5028	0.9802
125.00	0.5044	0.9803
150.00	0.6185	0.9637
150.00	0.6326	0.9642
170.00	0.7556	0.9108
170.00	0.7669	0.9142

Critical point

Gurdial, Gurdev S. - Foster, Neil R. - Yun, S. L. Jimmy - Tilly, Kevin D., Phase Behavior of Supercritical Fluid—Entrainment Systems, Supercritical Fluid Engineering Science. 514 (1992) 34-45.

T / K	P / bar	x_1
307.50	76.60	0.9955
309.70	78.90	0.9916
312.00	81.50	0.9872
315.00	85.50	0.9818
318.50	90.80	0.9763

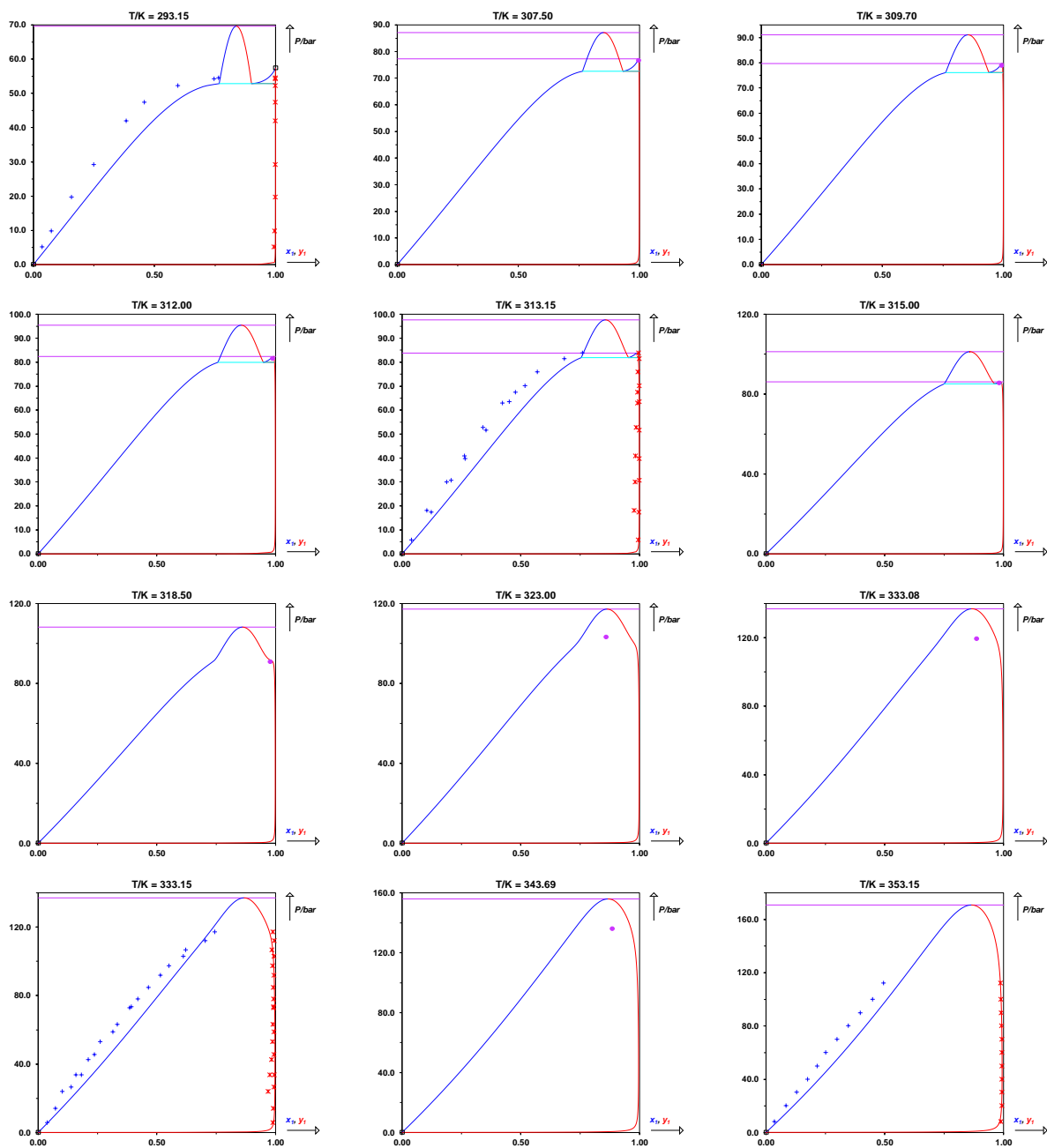
Gutiérrez, Jorge E. - Bejarano, Arturo - Fuente, Juan C. de la, Measurement and modeling of high-pressure (vapour+liquid) equilibria of (CO₂+alcohol) binary systems, The Journal of Chemical Thermodynamics. 42 (2010) 591-596. doi:10.1016/j.jct.2009.11.015

T / K	P / bar	x_1
323.00	103.20	0.8590

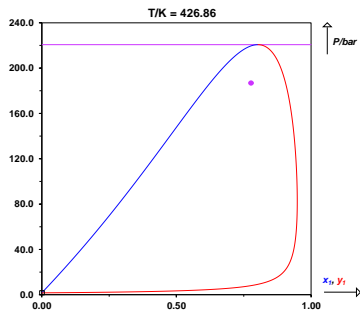
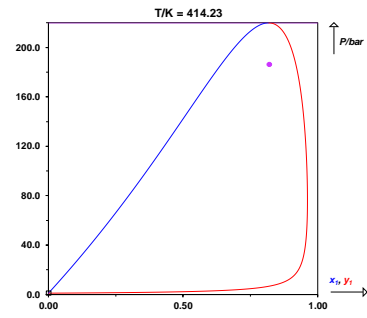
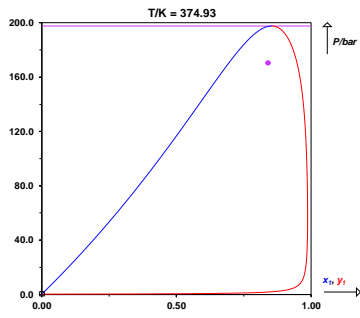
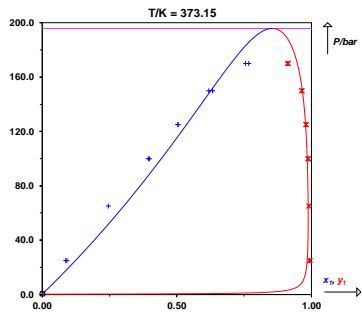
Silva-Oliver, G - Galicia-Luna, Luis A - Sandler, S. I, Vapor–liquid equilibria and critical points for the carbon dioxide +1-pentanol and carbon dioxide +2-pentanol systems at temperatures from 332 to 432 K, Fluid Phase Equilibria. 200 (2002) 161-172. doi:10.1016/S0378-3812(02)00024-9

T / K	P / bar	x_1
333.08	119.36	0.8866

SA-HA systems (BAC = 8)



SA-HA systems (BAC = 8)



AMMONIA (1) + WATER (2)

CAS	7664-41-7	7732-18-5
InChiKey	QGZKDVFNNGYKY-UHFFFAOYSA-N	XLYOFNOQVPJNP-UHFFFAOYSA-N
T_c / K	405.65	647.10
P_c / bar	112.80	220.64
ω	0.253	0.345

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = -495.7$

$B/\text{MPa} = -1326$

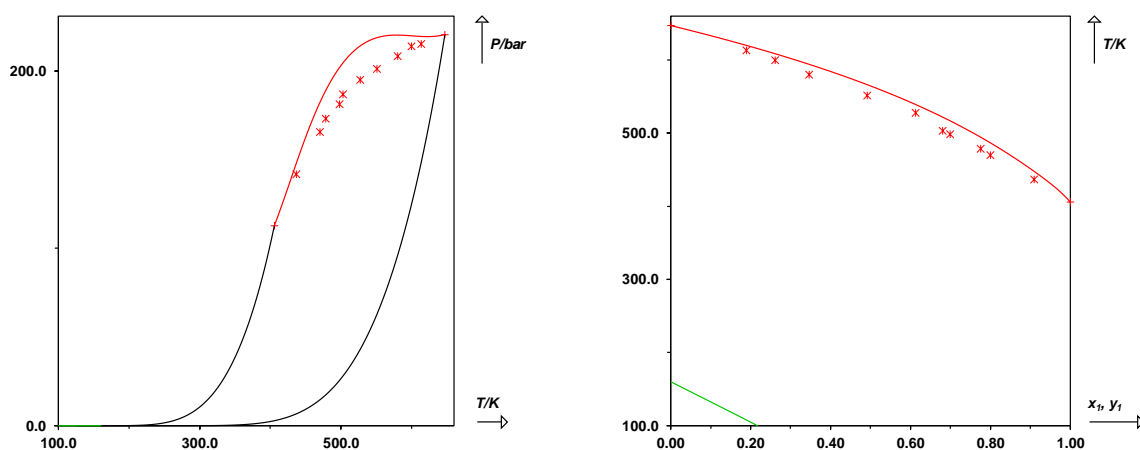
Deviations

MAPE on $x = 6.8\%$

MAPE on $y = 15\%$

MAPE on $x_c = 15\%$

MAPE on $P_c = 7.4\%$



-----			P / bar	x ₁	y ₁
Isothermal phase equilibrium data			1.600	0.1970	0.9280
-----			3.400	0.3180	0.9750
Wilson, T.A., The total and partial vapor pressures of aqueous ammonia solutions, Univ. Illinois Eng. Exp. Stand. Bull. 146 (1925)			6.500	0.4400	0.9910
Bull. 146 (1925)			10.60	0.5540	0.9960
T / K = 273.15			15.50	0.6830	0.9980
P / bar	x ₁	y ₁	20.70	0.8320	0.9990
3.685	0.8500	0.9998	Wilson, T.A., The total and partial vapor pressures of aqueous ammonia solutions, Univ. Illinois Eng. Exp. Stand. Bull. 146 (1925)		
2.818	0.7020	0.9994	T / K = 333.15		
2.424	0.6500	0.9991	P / bar	x ₁	y ₁
1.604	0.5330	0.9980	11.40	0.5400	0.9924
0.3430	0.3210	0.9883	7.429	0.4440	0.9858
0.2930	0.3050	0.9858	5.087	0.3740	0.9765
0.1711	0.2540	0.9742	4.150	0.3400	0.9694
0.0277	0.1080	0.8160	3.208	0.2990	0.9571
Wilson, T.A., The total and partial vapor pressures of aqueous ammonia solutions, Univ. Illinois Eng. Exp. Stand. Bull. 146 (1925)			2.934	0.2860	0.9533
T / K = 313.15			2.068	0.2380	0.9284
P / bar	x ₁	y ₁	1.456	0.1920	0.8920
11.46	0.7370	0.9984	0.9087	0.1360	0.8140
9.723	0.6640	0.9976	0.7319	0.1139	0.7620
8.631	0.6200	0.9970	Gillespie, P.C. - Wilding, W.V. - Wilson, G.M., Vapor-liquid equilibrium measurements on the ammonia-water system from 313 K to 589 K, AIChE Symp. Ser. 83 (1987) 97-127.		
6.921	0.5520	0.9955	T / K = 333.15		
2.667	0.3640	0.9840	P / bar	x ₁	y ₁
1.804	0.3105	0.9729	3.054	0.2945	0.9551
1.783	0.3080	0.9716	9.584	0.5110	0.9904
1.488	0.2850	0.9659	17.10	0.6965	0.9965
0.9445	0.2310	0.9416	18.89	0.7638	0.9974
0.2990	0.1127	0.7850	20.41	0.8033	0.9979
Gillespie, P.C. - Wilding, W.V. - Wilson, G.M., Vapor-liquid equilibrium measurements on the ammonia-water system from 313 K to 589 K, AIChE Symp. Ser. 83 (1987) 97-127.			23.79	0.9063	0.9988
T / K = 313.15			Clifford, I. I. - Hunter, E., The System Ammonia–Water at Temperatures up to 150°C. and at Pressures up to Twenty Atmospheres., The Journal of Physical Chemistry. 37 (1932) 101-118. doi:10.1021/j150343a014		
P / bar	x ₁	y ₁	T / K = 333.15		
1.538	0.2930	0.9667	P / bar	x ₁	y ₁
5.447	0.5118	0.9945	0.2434	0.0096	0.1720
9.928	0.6892	0.9982	0.2896	0.0197	0.2880
11.03	0.7350	0.9986	0.3709	0.0366	0.4310
12.27	0.7900	0.9990	0.4358	0.0494	0.5560
14.06	0.8850	0.9994	0.4937	0.0604	0.6020
Inomata, Hiroshi - Ikawa, Noboru - Arai, Kunio - Saito, Shozaburo, Vapor-liquid equilibria for the ammonia-methanol-water system, Journal of Chemical & Engineering Data. 33 (1988) 26-29. doi:10.1021/je00051a010			0.5916	0.0790	0.6960
T / K = 333.15			0.6385	0.0866	0.7230
			1.118	0.1538	0.8420

SA-SA systems (BAC = 9)

1.470	0.1891	0.9000	3.860	0.2054	0.8150
			6.230	0.2837	0.8948
			6.440	0.2935	0.9053
			7.670	0.3261	0.9154
			11.89	0.4173	0.9517
			15.10	0.4724	0.9635
			15.16	0.4805	0.9655
			19.17	0.5442	0.9750
			24.15	0.6162	0.9831
			30.93	0.7257	0.9890
			31.47	0.7337	0.9898
			35.23	0.7997	0.9918
			40.62	0.8934	0.9957
			45.24	0.9711	0.9980

Wilson, T.A., The total and partial vapor pressures of aqueous ammonia solutions, Univ. Illinois Eng. Exp. Stand. Bull. 146 (1925)

T / K = 353.15

P / bar	x_1	y_1
8.551	0.3680	0.9664
4.534	0.2650	0.9261
1.979	0.1490	0.7990
1.496	0.1150	0.7240

Gillespie, P.C. - Wilding, W.V. - Wilson, G.M., Vapor-liquid equilibrium measurements on the ammonia-water system from 313 K to 589 K, AIChE Symp. Ser. 83 (1987) 97-127.

T / K = 353.15

P / bar	x_1	y_1
5.757	0.3098	0.9445
15.51	0.5107	0.9836
27.51	0.7141	0.9933
28.75	0.7436	0.9940
29.65	0.7674	0.9945
32.27	0.8131	0.9954
32.54	0.8246	0.9957
36.40	0.8956	0.9970
38.13	0.9293	0.9978

Clifford, I. I. - Hunter, E., The System Ammonia-Water at Temperatures up to 150°C. and at Pressures up to Twenty Atmospheres., The Journal of Physical Chemistry. 37 (1932) 101-118. doi:10.1021/j150343a014

T / K = 353.15

P / bar	x_1	y_1
0.5530	0.0096	0.1430
0.6426	0.0197	0.2820
0.7708	0.0340	0.3810
0.7964	0.0366	0.4110
1.044	0.0604	0.5310
1.240	0.0790	0.6310

Rizvi, Syed S. H. - Heidemann, Robert A., Vapor-liquid equilibria in the ammonia-water system, Journal of Chemical & Engineering Data. 32 (1987) 183-191. doi:10.1021/jc00048a017

T / K = 359.70

P / bar	x_1	y_1
1.160	0.0368	0.2025
1.210	0.0428	0.2352
1.530	0.0777	0.4114
1.920	0.1064	0.5534
2.530	0.1399	0.6826

Gillespie, P.C. - Wilding, W.V. - Wilson, G.M., Vapor-liquid equilibrium measurements on the ammonia-water system from 313 K to 589 K, AIChE Symp. Ser. 83 (1987) 97-127.

T / K = 394.25

P / bar	x_1	y_1
3.103	0.0439	0.3727
4.344	0.0849	0.5651
11.72	0.2548	0.8659
34.82	0.5070	0.9584
54.49	0.6830	0.9752

Rizvi, Syed S. H. - Heidemann, Robert A., Vapor-liquid equilibria in the ammonia-water system, Journal of Chemical & Engineering Data. 32 (1987) 183-191. doi:10.1021/jc00048a017

T / K = 405.50

P / bar	x_1	y_1
3.580	0.0111	0.1111
4.520	0.0350	0.3077
6.650	0.0942	0.5691
11.58	0.1848	0.7839
20.85	0.3085	0.8780
31.28	0.4113	0.9169
42.26	0.5063	0.9348
50.66	0.5790	0.9557
59.09	0.6375	0.9680
100.66	0.9318	0.9897
111.93	0.9931	0.9932

Rizvi, Syed S. H. - Heidemann, Robert A., Vapor-liquid equilibria in the ammonia-water system, Journal of Chemical & Engineering Data. 32 (1987) 183-191. doi:10.1021/jc00048a017

T / K = 422.50

P / bar	x_1	y_1
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5.630	0.0192	0.1303	323.15	0.1900	0.9020
6.250	0.0348	0.2240	313.15	0.2400	0.9450
6.420	0.0374	0.2429	303.15	0.2910	0.9700
7.080	0.0512	0.3216	293.15	0.3460	0.9850
8.810	0.0848	0.4727	283.15	0.4060	0.9920
11.05	0.1297	0.5913			
18.32	0.2220	0.7620			
26.69	0.3078	0.8279			
36.71	0.3934	0.8701			
49.89	0.4876	0.8951			
70.10	0.6098	0.9140			
82.23	0.6780	0.9169			
102.14	0.7852	0.9163			
114.73	0.8714	0.9140			
117.63	0.8740	0.9153			

Rizvi, Syed S. H. - Heidemann, Robert A., Vapor-liquid equilibria in the ammonia-water system, Journal of Chemical & Engineering Data. 32 (1987) 183-191. doi:10.1021/je00048a017

T / K = 451.50

P / bar	x ₁	y ₁
11.06	0.0174	0.1302
11.94	0.0352	0.2518
14.16	0.0571	0.3695
17.09	0.0859	0.4659
23.64	0.1720	0.6829
33.53	0.2391	0.7524
51.72	0.3354	0.8326
70.72	0.4668	0.8834
88.51	0.5480	0.9013
100.45	0.5857	0.8995
116.77	0.6817	0.9023
130.57	0.7335	0.8927
139.39	0.7764	0.8879
147.23	0.8167	0.8863
151.14	0.8717	0.8854

Isobaric phase equilibrium data

Clifford, I. I. - Hunter, E., The System Ammonia-Water at Temperatures up to 150°C. and at Pressures up to Twenty Atmospheres., The Journal of Physical Chemistry. 37 (1932) 101-118. doi:10.1021/j150343a014

P / bar = 1.013

T / K	x ₁	y ₁
363.15	0.0290	0.3180
353.15	0.0610	0.5260
343.15	0.1000	0.7000
333.15	0.1440	0.8250

Chu, J.C. - Getty, R.J. - Brennecke, L.F. - Paul, R., Distillation Equilibrium Data (1950)

P / bar = 1.013

T / K	x ₁	y ₁
364.65	0.0210	0.2320
357.95	0.0410	0.4210
352.15	0.0610	0.5550
346.65	0.0820	0.6700
341.55	0.1020	0.7390
330.25	0.1600	0.8510
319.35	0.2100	0.9210
309.75	0.2600	0.9580
291.35	0.3620	0.9910
283.15	0.4160	0.9960

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 2.533

T / K	x ₁
383.25	0.0500
369.45	0.1000
357.15	0.1500
345.95	0.2000
335.55	0.2500
325.75	0.3000
307.15	0.4000
290.55	0.5000
278.05	0.6000
270.05	0.7000
264.95	0.8000
261.35	0.9000

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 2.533

T / K	y ₁
394.85	0.1500
388.95	0.3000
382.05	0.4500
373.75	0.6000
366.45	0.7000

SA-SA systems (BAC = 9)

357.15	0.8000
350.75	0.8500
342.55	0.9000
330.05	0.9500
316.35	0.9800
307.85	0.9900

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 4.560

T / K	x ₁
403.85	0.0500
389.75	0.1000
377.05	0.1500
365.25	0.2000
354.65	0.2500
344.25	0.3000
324.85	0.4000
307.75	0.5000
294.85	0.6000
286.25	0.7000
280.55	0.8000
276.45	0.9000

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 4.560

T / K	y ₁
414.55	0.1500
407.65	0.3000
400.05	0.4500
390.85	0.6000
382.85	0.7000
372.65	0.8000
366.05	0.8500
357.15	0.9000
343.55	0.9500
327.65	0.9800

Clifford, I. I. - Hunter, E., The System Ammonia–Water at Temperatures up to 150°C. and at Pressures up to Twenty Atmospheres., The Journal of Physical Chemistry. 37 (1932) 101-118. doi:10.1021/j150343a014

P / bar = 6.080

T / K	x ₁	y ₁
423.15	0.0260	0.1950
413.15	0.0590	0.4000

403.15	0.0960	0.5710
393.15	0.1350	0.6990
383.15	0.1760	0.7840
373.15	0.2200	0.8480
363.15	0.2660	0.9000
353.15	0.3140	0.9420
343.15	0.3660	0.9700

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 6.080

T / K	x ₁
415.05	0.0500
400.95	0.1000
388.05	0.1500
376.05	0.2000
365.15	0.2500
354.35	0.3000
334.65	0.4000
317.35	0.5000
303.65	0.6000
295.05	0.7000
289.15	0.8000
284.65	0.9000

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 6.080

T / K	y ₁
425.05	0.1500
417.85	0.3000
409.65	0.4500
399.85	0.6000
391.45	0.7000
380.75	0.8000
373.85	0.8500
364.45	0.9000
349.75	0.9500
332.95	0.9800
322.45	0.9900

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 9.119

T / K	x ₁
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SA-SA systems (BAC = 9)

432.15	0.0500
417.85	0.1000
404.45	0.1500
392.25	0.2000
380.75	0.2500
369.75	0.3000
349.45	0.4000
331.35	0.5000
317.45	0.6000
308.35	0.7000
301.95	0.8000
297.25	0.9000

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 9.119

T / K	y_1
440.75	0.1500
432.95	0.3000
424.15	0.4500
413.45	0.6000
404.55	0.7000
393.15	0.8000
385.55	0.8500
375.65	0.9000
359.65	0.9500
340.75	0.9800
328.85	0.9900

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 11.15

T / K	x_1
441.05	0.0500
426.65	0.1000
413.15	0.1500
401.05	0.2000
389.25	0.2500
378.05	0.3000
357.45	0.4000
338.85	0.5000
324.65	0.6000
315.55	0.7000
308.95	0.8000
304.05	0.9000

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 11.15

T / K	y_1
449.05	0.1500
440.85	0.3000
431.65	0.4500
420.35	0.6000
411.25	0.7000
399.45	0.8000
391.65	0.8500
381.35	0.9000
364.75	0.9500
344.95	0.9800

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 15.20

T / K	x_1
455.15	0.0500
441.05	0.1000
427.55	0.1500
414.85	0.2000
402.85	0.2500
391.45	0.3000
370.25	0.4000
351.15	0.5000
336.95	0.6000
327.25	0.7000
320.15	0.8000
315.05	0.9000

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 15.20

T / K	y_1
462.45	0.1500
453.65	0.3000
443.85	0.4500
431.45	0.6000
421.95	0.7000
409.65	0.8000
401.15	0.8500
390.15	0.9000
372.65	0.9500

352.55 0.9800

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 19.25

T / K	x_1
467.15	0.0500
452.85	0.1000
439.35	0.1500
426.25	0.2000
414.05	0.2500
402.85	0.3000
380.65	0.4000
361.35	0.5000
346.65	0.6000
336.85	0.7000
329.55	0.8000
324.05	0.9000

Wucherer, J., Measurement of the pressure, temperature and composition of the liquid and vapor phases of ammonia-water mixtures in the saturated state, Z. gesamte Kaelte-Ind. 39 (1932) 136-140.

P / bar = 19.25

T / K	y_1
473.45	0.1500
464.15	0.3000
453.65	0.4500
440.55	0.6000
430.65	0.7000
417.75	0.8000
408.95	0.8500
397.05	0.9000
378.35	0.9500
358.65	0.9800

Critical point

Sakabe, A. - Arai, D. - Miyamoto, H. - Uematsu, M., Measurements of the critical parameters for $\{x\text{NH}_3+(1-x)\text{H}_2\text{O}\}$ with $x=(0.9098,0.7757,0.6808)$, The Journal of Chemical Thermodynamics. 40 (2008) 1527-1530. doi:10.1016/j.jct.2008.05.017

T / K	P / bar	x_1
436.56	141.82	0.9098
478.58	173.07	0.7757
503.06	186.93	0.6808

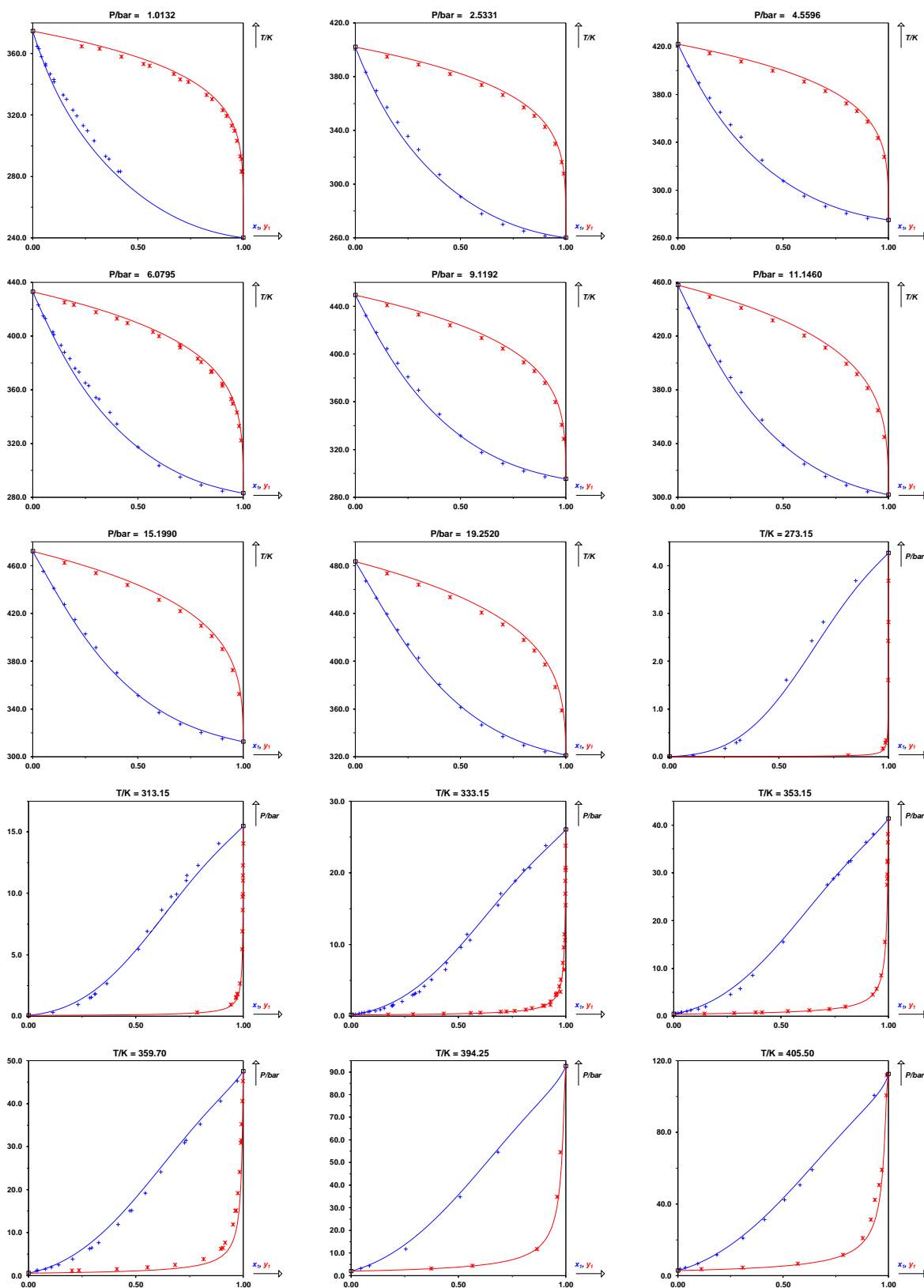
Sassen, C. L. - Van Kwartel, R. A. C. - Van der Kooi, H. J. - De Swaan Arons, J., Vapor-liquid equilibria for the system ammonia + water up to the critical region, Journal of Chemical & Engineering Data. 35 (1990) 140-144. doi:10.1021/je00060a013

T / K	P / bar	x_1
470.00	165.70	0.8000
498.10	181.30	0.6990
527.30	194.90	0.6130
551.10	201.30	0.4910
580.10	208.30	0.3460
613.50	215.20	0.1890

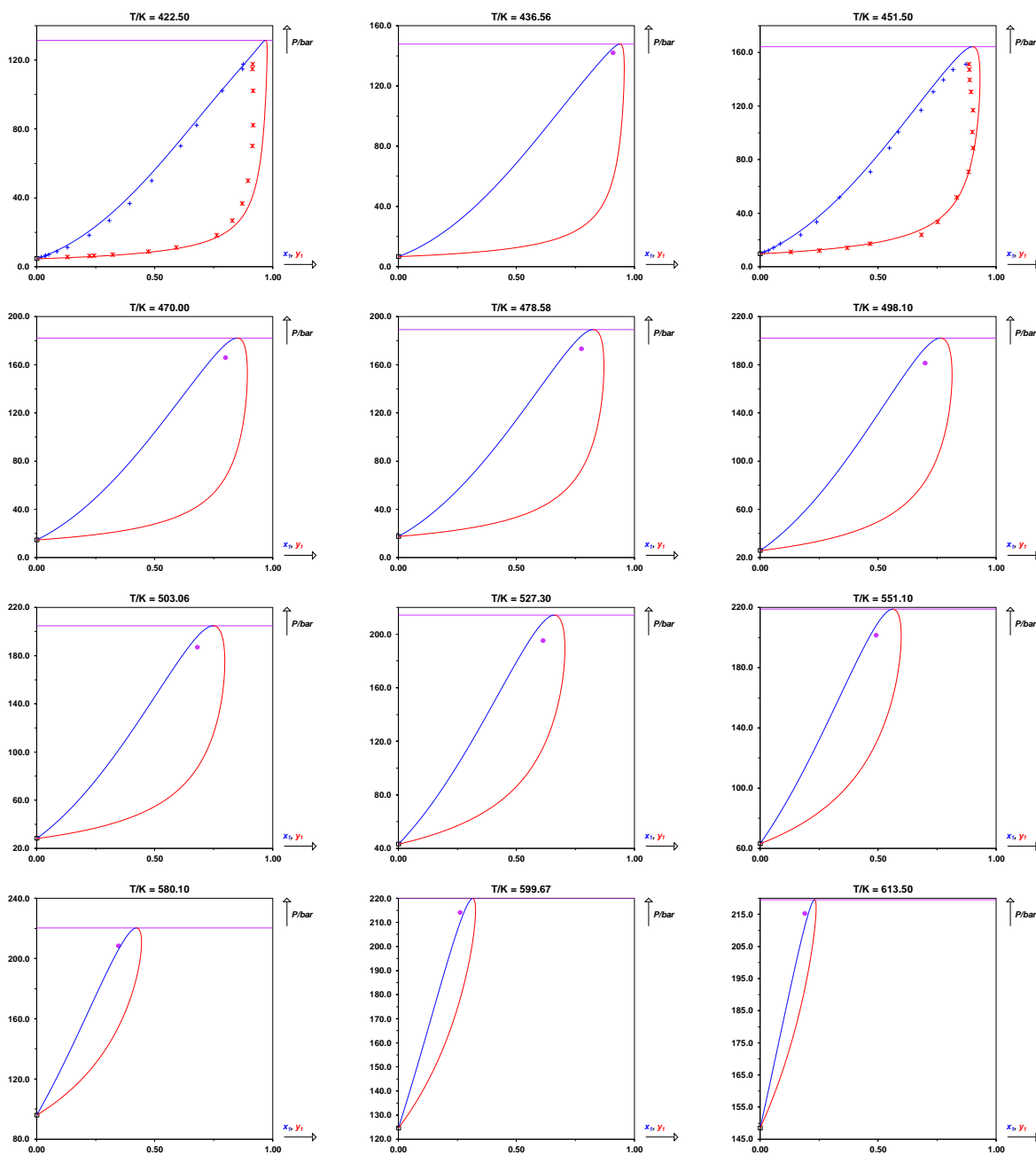
Polikhronidi, N.G. - Abdulagatov, I.M. - Batyrova, R.G. - Stepanov, G.V., PVT measurements of water-ammonia refrigerant mixture in the critical and supercritical regions, International Journal of Refrigeration. 32 (2009) 1897-1913. doi:10.1016/j.ijrefrig.2009.07.008

T / K	P / bar	x_1
599.67	214.08	0.2607

SA-SA systems (BAC = 9)



SA-SA systems (BAC = 9)



AMMONIA (1) + ACETONITRILE (2)

CAS	7664-41-7	75-05-8
InChiKey	QGZKDVFNNGYKY-UHFFFAOYSA-N	WEVYAHXRMPXWCK-UHFFFAOYSA-N
T_c / K	405.65	545.50
P_c / bar	112.80	48.50
ω	0.253	0.342

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 80.26$$

$$B/\text{MPa} = 118.4$$

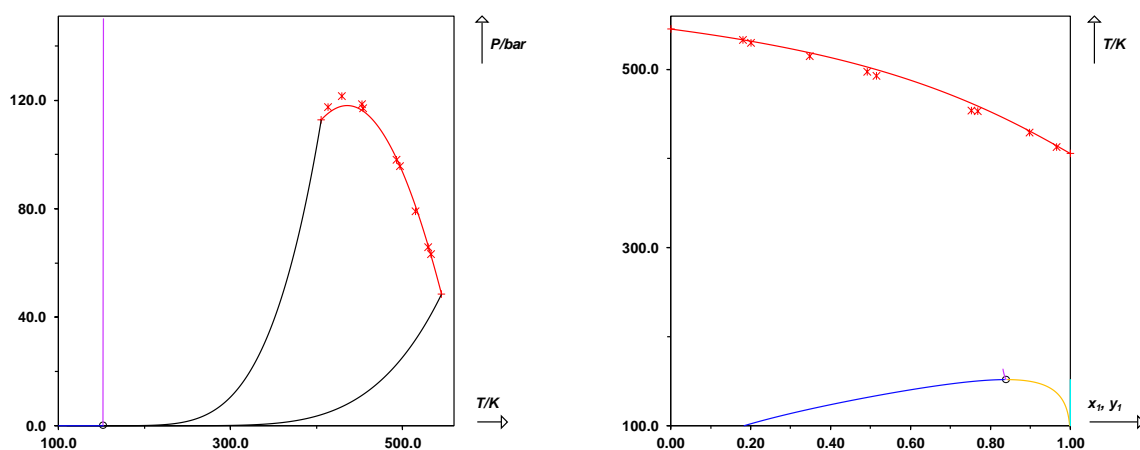
Deviations

$$\text{MAPE on } x = 4.2\%$$

$$\text{MAPE on } y = 11\%$$

$$\text{MAPE on } x_c = 7.4\%$$

$$\text{MAPE on } P_c = 1.4\%$$



Isothermal phase equilibrium data

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K = 293.15

P / bar	x ₁	y ₁
2.027	0.2250	0.9000
4.053	0.4500	0.9630
6.080	0.6950	0.9850
8.106	0.9250	0.9970

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K = 333.15

P / bar	x ₁	y ₁
5.066	0.2000	0.8500
10.13	0.4080	0.9500
15.20	0.6000	0.9800
20.27	0.7800	0.9930

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K = 373.15

P / bar	x ₁	y ₁
5.066	0.0730	0.5700
10.13	0.1700	0.7900
15.20	0.2900	0.8800
20.27	0.3950	0.9200
30.40	0.5900	0.9500
40.53	0.7450	0.9700
50.66	0.8700	0.9850

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K = 413.15

P / bar	x ₁	y ₁	
10.13	0.0700	0.5150	
20.27	0.2030	0.7500	
30.40	0.3400	0.8230	
40.53	0.4700	0.8600	
60.80	0.6500	0.9090	
81.06	0.7870	0.9430	
101.33	0.8900	0.9670	
117.54	0.9650	0.9650	CRIT

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K = 453.15

P / bar	x ₁	y ₁	
20.27	0.0920	0.4700	
40.53	0.2800	0.6730	
60.80	0.4380	0.7370	
81.06	0.5500	0.7680	
101.33	0.6480	0.7750	
118.55	0.7680	0.7680	CRIT

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K = 493.15

P / bar	x ₁	y ₁	
40.53	0.1380	0.3930	
60.80	0.2700	0.4830	
81.06	0.3780	0.5100	
97.98	0.5150	0.5150	CRIT

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K = 533.15

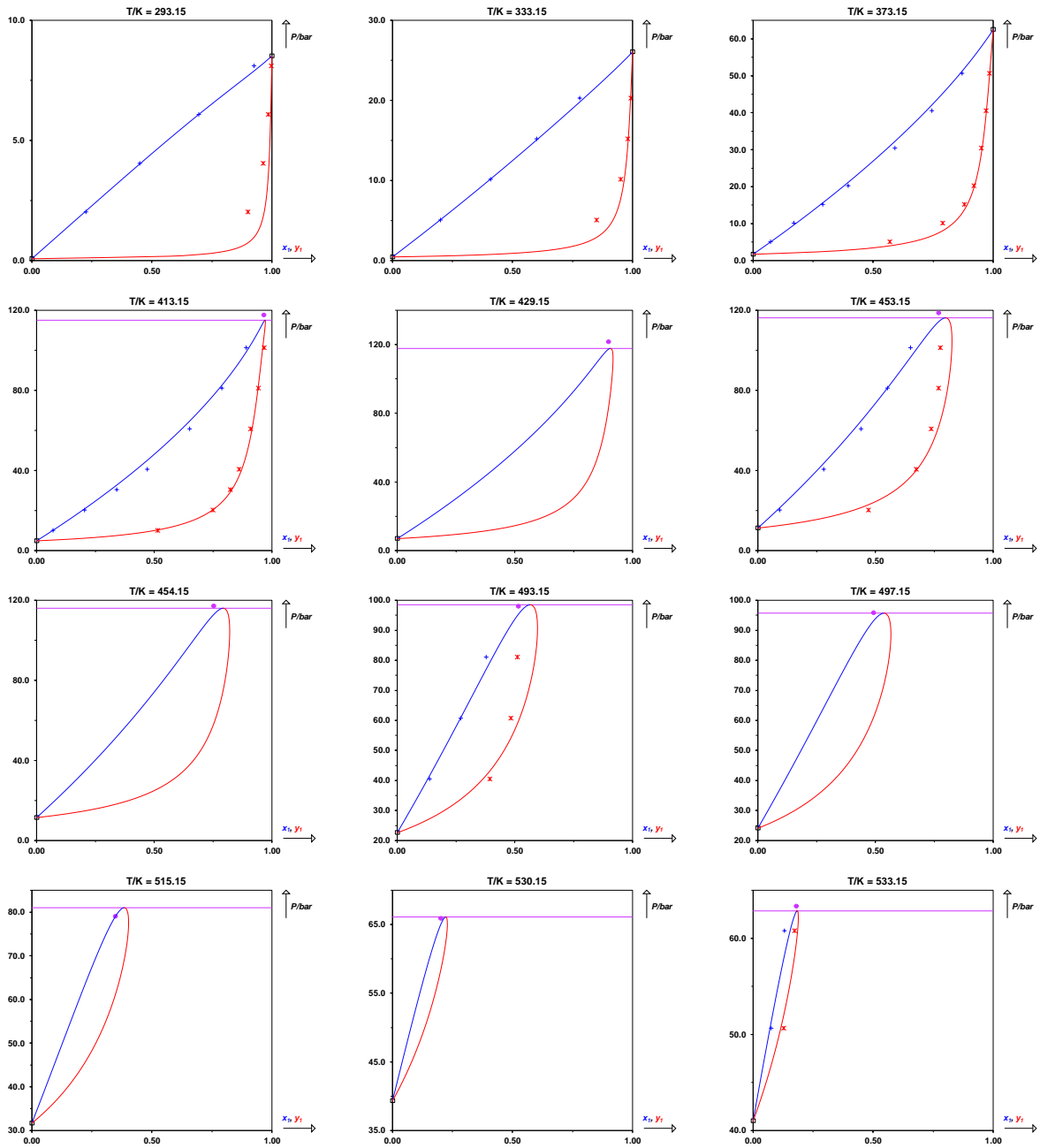
P / bar	x ₁	y ₁	
50.66	0.0750	0.1270	
60.80	0.1300	0.1730	
63.33	0.1800	0.1800	CRIT

Critical point

Tyvina, T.N. - Naumova, A.A. - Fokina, V.V., Liquid-gas equilibrium in an acetonitrile-ammonia system, J. Appl. Chem. USSR. 52 (1979) 2458-2460.

T / K	P / bar	x ₁
429.15	121.59	0.8970
454.15	117.03	0.7520
497.15	95.75	0.4920
515.15	79.03	0.3480
530.15	65.86	0.2010

SA-SA systems (BAC = 9)



WATER (1) + ACETONITRILE (2)

CAS	7732-18-5	75-05-8
InChiKey	XLYOFNOQVPJNPN-UHFFFAOYSA-N	WEVYAHXRMPXWCK-UHFFFAOYSA-N
T_c / K	647.10	545.50
P_c / bar	220.64	48.50
ω	0.345	0.342

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = 402.2$

$B/\text{MPa} = 142.1$

Deviations

MAPE on $x = 71\%$

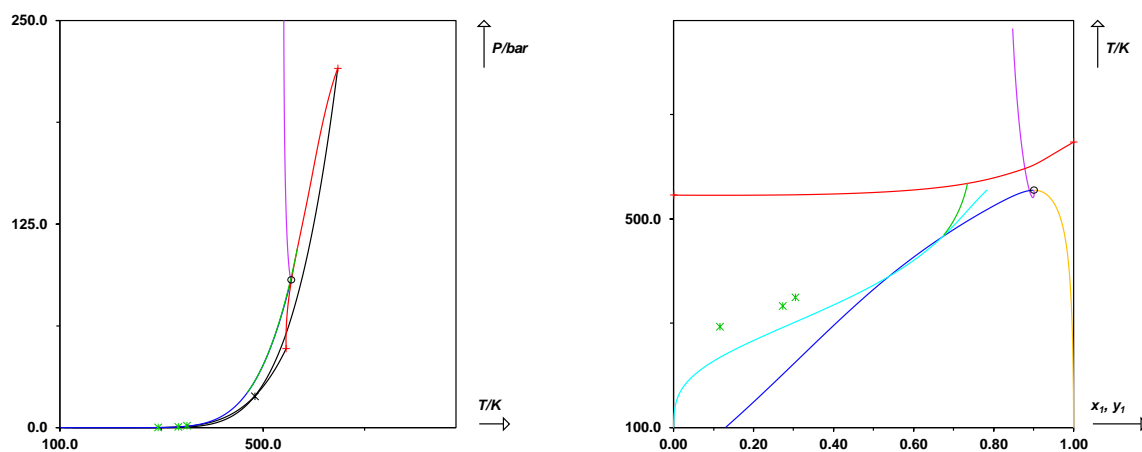
MAPE on $y = 33\%$

MAPE on $x_{az} = 13\%$

MAPE on $P_{az} = 16\%$

MAPE on $h^M = 55\%$

MAPE on $c_p^M = 158\%$



-----			0.5576	0.4060	0.3078	
Isothermal phase equilibrium data			0.5602	0.3280	0.2889	
-----			0.5622	0.2720	0.2720	AZEO
Vierk, Anna-Luise, Experimentelle Untersuchungen an den Zweistoffsystemen: Wasser-Acetonitril, Wasser-Dioxan, Äthanol-Acetonitril und Cyclohexan-Dioxan, Zeitschrift für anorganische Chemie. 261 (1950) 283-296. doi:10.1002/zaac.19502610504			0.5614	0.2511	0.2646	
T / K = 293.15			0.5593	0.1996	0.2437	
P / bar	x_1	y_1	0.5493	0.1214	0.1901	
0.0840	0.9300	0.2063	0.5253	0.0529	0.1061	
0.0953	0.8500	0.1706	-----			
0.0976	0.8100	0.1530	Isobaric phase equilibrium data			
0.0989	0.6500	0.1415	-----			
0.0996	0.3500	0.1406	Szydłowski, Jerzy - Szykuła, Marek, Isotope effect on miscibility of acetonitrile and water, Fluid Phase Equilibria. 154 (1999) 79-87. doi:10.1016/S0378-3812(98)00438-5			
0.0999	0.2400	0.1295	P / bar = 1.013			
0.1000	0.1150	0.1150	T / K	x_1^a	x_1^b	
0.0997	0.0800	0.1110	259.97	0.3000	-	
AZEO			263.92	0.3500	-	
Park, S-Jin - Oh, Hyeog-Jong - Choi, Ho-Jun - Peak, Seung-Kwan - Fischer, K. - Gmehling, J., Phase equilibrium and excess molar volume for systems acrylonitrile+water, acetonitrile+water, and acrylonitrile+acetonitrile, Hwahak Konghak. 35 (1997) 678-683.			267.39	0.4050	-	
T / K = 323.15			269.36	0.4500	-	
P / bar	x_1	y_1	270.92	0.5020	-	
0.1533	0.9913	0.7957	271.43	0.5400	-	
0.2088	0.9730	0.5745	271.73	0.5720	-	
0.2734	0.9429	0.4287	271.78	0.5980	-	
0.3510	0.8439	0.3201	271.81	0.6250	-	
0.3689	0.7246	0.2983	271.80	-	0.6510	
0.3752	0.5546	0.2882	271.77	-	0.6740	
0.3809	0.3388	0.2694	271.61	-	0.6990	
0.3802	0.1904	0.2295	271.23	-	0.7260	
0.3654	0.0692	0.1222	270.52	-	0.7500	
0.3585	0.0422	0.0861	267.39	-	0.7990	
Sugi, Hiroshi - Katayama, Takashi, Ternary Liquid-Liquid And Miscible Binary Vapor-Liquid Equilibrium Data For The Two Systems n-Hexane Ethanol Acetonitrile And Water Acetonitrile-Ethyl Acetate, Journal of Chemical Engineering of Japan. 11 (1978) 167-172. doi:10.1252/jcej.11.167			263.14	-	0.8300	
T / K = 333.15			Acosta, Jhoany - Arce, Alberto - Rodil, Eva - Soto, Ana, A thermodynamic study on binary and ternary mixtures of acetonitrile, water and butyl acetate, Fluid Phase Equilibria. 203 (2002) 83-98. doi:10.1016/S0378-3812(02)00171-1			
P / bar	x_1	y_1	P / bar = 1.013			
0.3386	0.9700	0.5791	T / K	x_1	y_1	
0.4305	0.9346	0.4582	372.77	0.9994	0.9864	
0.4896	0.8873	0.4011	371.86	0.9969	0.9545	
0.5226	0.8156	0.3645	371.51	0.9967	0.9398	
0.5350	0.7470	0.3450	370.42	0.9936	0.9045	
0.5478	0.5853	0.3268	369.07	0.9894	0.8539	
0.5521	0.5157	0.3208	367.92	0.9866	0.8148	
			366.81	0.9831	0.7758	
			365.98	0.9805	0.7445	
			364.89	0.9766	0.7079	
			363.57	0.9716	0.6706	

SA-SA systems (BAC = 9)

362.09	0.9639	0.6213		9.200	0.9287
360.43	0.9566	0.5811		40.10	0.9175
358.96	0.9471	0.5445		73.10	0.9063
357.11	0.9325	0.4946		107.20	0.8950
354.78	0.9031	0.4479		141.60	0.8836
353.12	0.8657	0.4123		175.40	0.8723
351.64	0.7932	0.3833		208.10	0.8609
350.87	0.7036	0.3654		239.90	0.8494
350.61	0.6551	0.3631		270.60	0.8379
350.31	0.5944	0.3567		300.00	0.8264
350.07	0.5167	0.3470		327.80	0.8149
349.86	0.4590	0.3387		354.50	0.8034
349.74	0.3997	0.3290		380.40	0.7918
349.66	0.3232	0.3113		405.00	0.7802
349.66	0.3050	0.3050	AZEO	428.70	0.7687
349.68	0.2886	0.3018		451.80	0.7572
349.72	0.2511	0.2868		474.30	0.7456
349.82	0.2234	0.2741		495.90	0.7340
349.92	0.2090	0.2614		516.90	0.7224
350.07	0.1795	0.2490		537.50	0.7109
350.25	0.1610	0.2351		557.30	0.6994
350.53	0.1353	0.2154		586.50	0.6842
350.79	0.1182	0.1993		611.30	0.6683
351.11	0.1016	0.1811		635.70	0.6522
351.56	0.0821	0.1569		661.90	0.6343
352.08	0.0626	0.1292		689.40	0.6145
353.04	0.0356	0.0819		717.40	0.5933
353.64	0.0214	0.0524		745.60	0.5709

-----				773.70	0.5469
-----				802.80	0.5200
Enthalpy of mixing				830.70	0.4913
-----				857.40	0.4596
Stokes, R.H, Excess partial molar enthalpies for (acetonitrile + water) from 278 to 318 K, The Journal of Chemical Thermodynamics. 19 (1987) 977-983. doi:10.1016/0021-9614(87)90044-9				881.00	0.4250
T / K = 278.15				898.80	0.3873
P / bar = UNKNOWN (1.0132)				907.80	0.3444
$h^M / \text{J.mol}^{-1}$	x_1			901.40	0.2973
-4.600	0.9987			881.30	0.2586
-13.30	0.9960			856.60	0.2307
-24.90	0.9919			819.20	0.2011
-37.20	0.9864			764.60	0.1697
-46.00	0.9808			685.20	0.1363
-51.20	0.9752			570.40	0.1005
-53.00	0.9698			403.10	0.0623
-51.90	0.9643			227.90	0.0318
-48.20	0.9590			128.30	0.0170
-38.20	0.9509			65.20	0.0084
-17.70	0.9398			15.60	0.0020

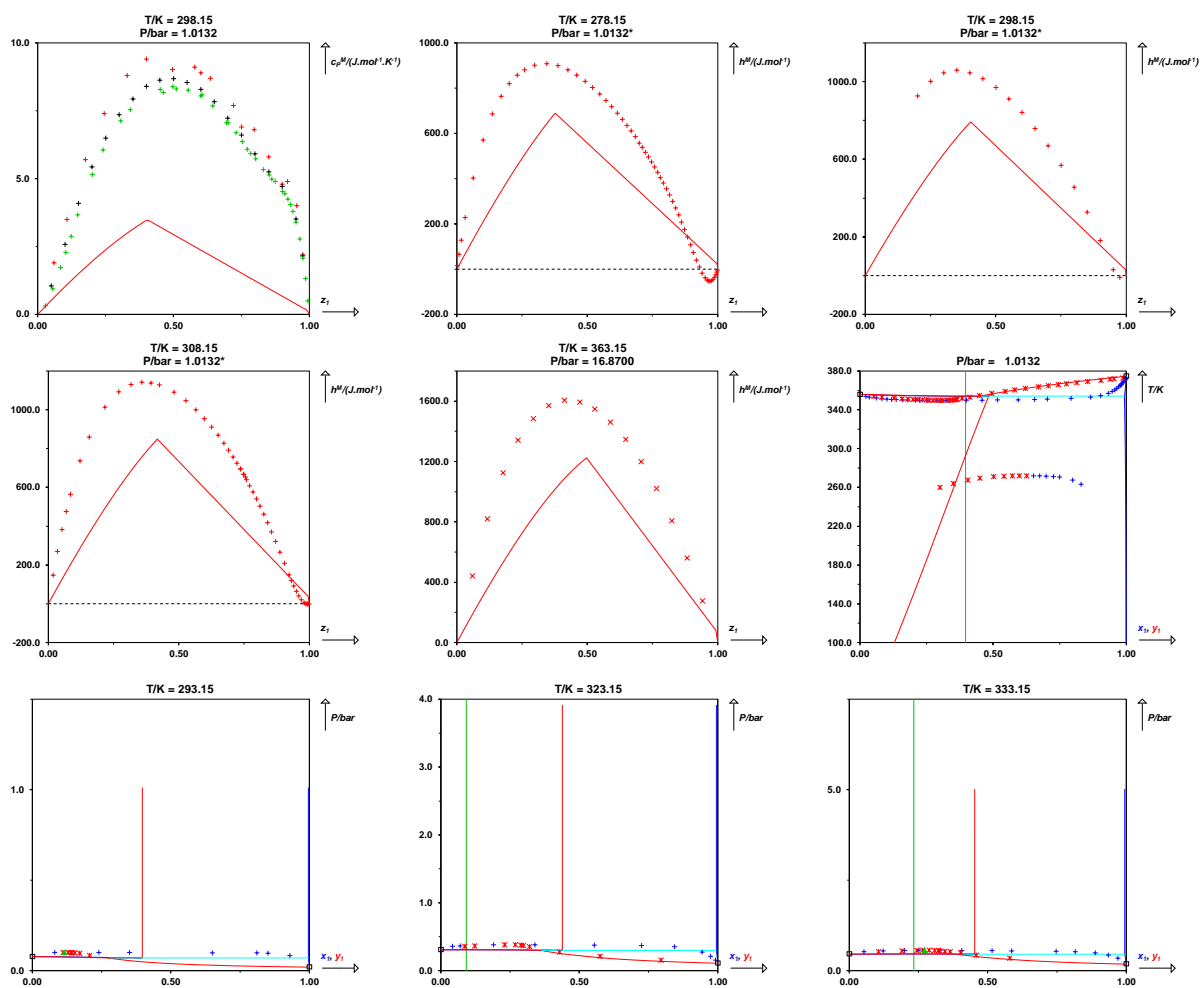
Nakamura, Masanori - Tamura, Katsutoshi - Murakami,
Sachio, Isotope effects on thermodynamic properties:

mixtures of x(D2O or H2O) + (1 - x)CH3CN at 298.15 K,		540.60	0.7973
Thermochemica Acta. 253 (1995) 127-136.		575.70	0.7840
doi:10.1016/0040-6031(94)02086-4		608.80	0.7712
T / K =	298.15	639.50	0.7588
P / bar =	UNKNOWN (1.0132)	652.50	0.7544
$h^M / \text{J.mol}^{-1}$	x_1	666.50	0.7485
-8.500	0.9750	668.00	0.7468
30.70	0.9500	694.50	0.7364
180.60	0.9000	695.00	0.7357
326.10	0.8500	725.40	0.7224
454.70	0.8000	756.90	0.7077
568.80	0.7500	792.60	0.6903
669.70	0.7000	828.40	0.6719
758.90	0.6500	869.00	0.6497
840.60	0.6000	910.80	0.6250
909.70	0.5500	954.90	0.5977
969.40	0.5000	1000.7	0.5654
1015.2	0.4500	1047.7	0.5263
1045.6	0.4000	1091.2	0.4817
1058.5	0.3500	1128.9	0.4259
1044.3	0.3000	1139.1	0.3931
1001.2	0.2500	1141.7	0.3574
926.90	0.2000	1129.9	0.3167
Stokes, R.H, Excess partial molar enthalpies for		1092.7	0.2703
(acetonitrile + water) from 278 to 318 K, The Journal of		1013.5	0.2172
Chemical Thermodynamics. 19 (1987) 977-983.		859.40	0.1560
doi:10.1016/0021-9614(87)90044-9		736.00	0.1216
T / K =	308.15	563.90	0.0843
P / bar =	UNKNOWN (1.0132)	475.00	0.0683
$h^M / \text{J.mol}^{-1}$	x_1	381.80	0.0523
-1.200	0.9978	270.50	0.0349
-2.100	0.9946	146.90	0.0178
-2.200	0.9927		
-1.800	0.9895		
0.8000	0.9842	Schedemann, A., Weiterentwicklung von	
5.400	0.9793	thermodynamischen Vorhersagemethoden als Grundlage	
20.10	0.9692	für die Lösungsmittelauswahl bei der Flüssig-Flüssig-	
40.30	0.9594	Extraktion und der Absorption (2013)	
64.50	0.9497	T / K =	363.15
91.30	0.9403	P / bar =	16.87
119.80	0.9310	$h^M / \text{J.mol}^{-1}$	z_1
149.10	0.9219	276.29	0.9410
208.20	0.9042	560.65	0.8822
266.20	0.8871	806.54	0.8233
320.20	0.8709	1020.4	0.7643
371.30	0.8550	1198.5	0.7055
418.50	0.8398	1345.8	0.6466
462.10	0.8251	1461.5	0.5879
503.00	0.8110	1547.7	0.5288
		1594.6	0.4703
		1605.0	0.4114

1570.1	0.3524	5.910	0.7999
1484.6	0.2936	6.610	0.7499
1340.3	0.2348	7.230	0.6999
1125.7	0.1763	7.830	0.6499
820.48	0.1173	8.280	0.5999
442.24	0.0590	8.540	0.5499
		8.680	0.4999
		8.620	0.4499
		8.400	0.3999
		7.930	0.3499
		7.360	0.2999
		6.490	0.2499
		5.430	0.1999
		4.090	0.1499
		2.570	0.0999
		1.050	0.0500
Heat capacity of mixing			
De Visser, Cees - Heuvelsland, Wim J. M. - Dunn, Lawrence A. - Somsen, Gus, Some properties of binary aqueous liquid mixtures. Apparent molar volumes and heat capacities at 298.15 K over the whole mole fraction range, Journal of the Chemical Society, Faraday Transactions 1: Physical Chemistry in Condensed Phases. 74 (1978) doi:10.1039/f19787401159			
T / K =	298.15		
P / bar =	UNKNOWN (1.0132)		
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1	Benson, George C. - D'Arcy, Patrick J. - Handa, Yash Paul, Thermodynamics of aqueous mixtures of nonelectrolytes. V. Isobaric heat capacities and ultrasonic speeds for water + ethanenitrile mixtures at 25°C, Thermochimica Acta. 46 (1981) 295-301. doi:10.1016/0040-6031(81)80328-0	
2.200	0.9760	T / K =	298.15
4.000	0.9530	P / bar =	UNKNOWN (1.0132)
4.900	0.9200	$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
4.800	0.9000	0.5060	0.9948
5.800	0.8500	1.314	0.9853
6.800	0.7970	2.070	0.9755
6.900	0.7500	2.770	0.9643
7.700	0.7200	3.390	0.9509
8.700	0.6360	3.790	0.9392
8.900	0.6010	4.040	0.9301
9.100	0.5780	4.240	0.9202
9.020	0.4960	4.440	0.9089
9.400	0.4000	4.530	0.9009
8.800	0.3290	4.900	0.8737
7.400	0.2440	4.980	0.8612
5.700	0.1750	5.140	0.8523
3.500	0.1080	5.340	0.8309
1.900	0.0600	5.730	0.8023
		5.930	0.7843
		6.080	0.7719
		6.370	0.7523
		6.690	0.7305
		7.060	0.7012
		7.060	0.6950
		7.680	0.6441
		8.090	0.6047
		8.050	0.5999
		8.260	0.5541
Nakamura, Masanori - Tamura, Katsutoshi - Murakami, Sachio, Isotope effects on thermodynamic properties: mixtures of x(D2O or H2O) + (1 - x)CH3CN at 298.15 K, Thermochimica Acta. 253 (1995) 127-136. doi:10.1016/0040-6031(94)02086-4			
T / K =	298.15		
P / bar =	UNKNOWN (1.0132)		
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1		
2.150	0.9750		
3.510	0.9500		
4.710	0.9000		
5.250	0.8499		

SA-SA systems (BAC = 9)

8.300	0.5098
8.380	0.4973
8.180	0.4617
8.290	0.4501
7.540	0.3403
7.130	0.3049
6.060	0.2398
5.150	0.2013
3.660	0.1469
2.880	0.1231
2.280	0.1029
1.730	0.0837
0.9400	0.0548
0.3100	0.0280



WATER (1) + ALLYL ALCOHOL (2)

CAS	7732-18-5	107-18-6
InChiKey	XLYOFNOQVPJNPN-UHFFFAOYSA-N	XXROGKLTUQVRX-UHFFFAOYSA-N
T_c / K	647.10	545.10
P_c / bar	220.64	56.20
ω	0.345	0.570

Non-ideal with non-assessed causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

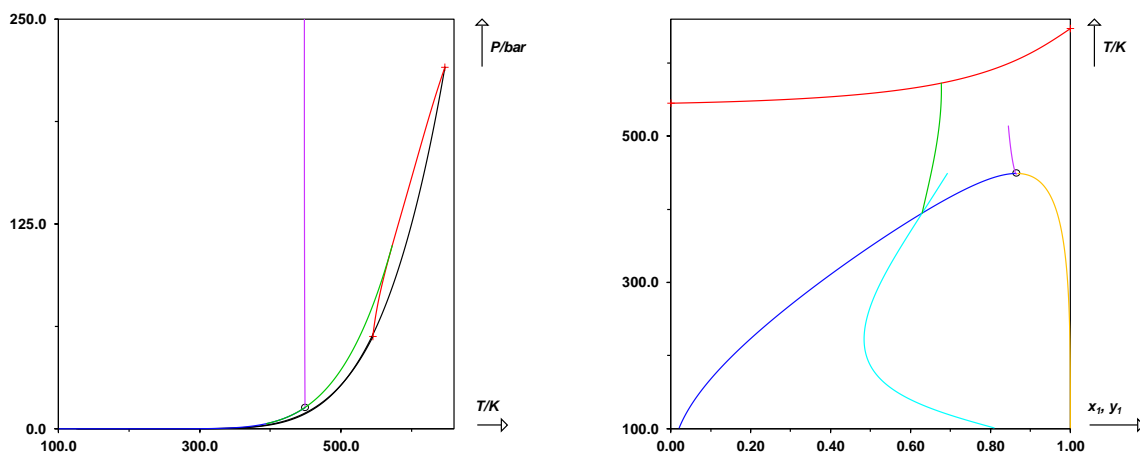
$$A/\text{MPa} = 414.6$$

$$B/\text{MPa} = 314.1$$

Deviations

$$\text{MAPE on } x = 36\%$$

$$\text{MAPE on } y = 8.2\%$$

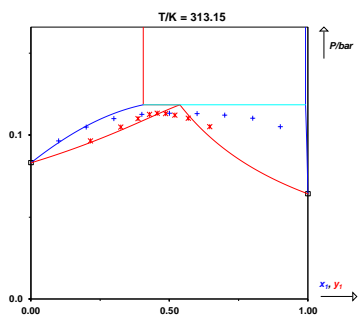
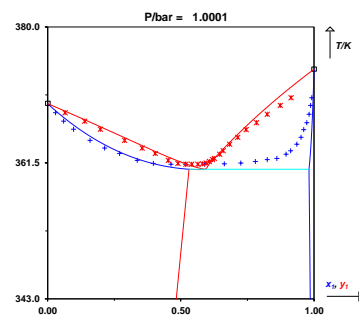
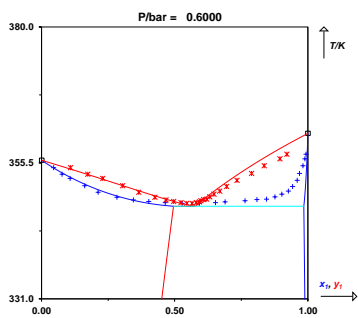
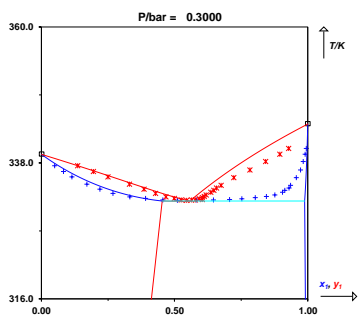


-----			335.73	0.1144	0.2495
Isothermal phase equilibrium data			336.62	0.0820	0.1947
-----			337.54	0.0499	0.1361
Ewert, M., Theory of concentrated solutions. XIII. Aqueous solutions of organic compounds, Bull. Soc. Chim. Belg. 45 (1936) 493-515.			Aucejo, A. - Loras, S. - Monton, J.B., Isobaric vapor-liquid equilibria of prop-2-en-1-ol (allyl alcohol) + water system at 30, 60, and 100 kPa, ELDATA: The International Electronic Journal of Physico-Chemical Data. 2 (1996) 1-4.		
T / K = 313.15			P / bar = 0.6000		
P / bar	x ₁	y ₁	T / K	x ₁	y ₁
0.1051	0.9000	0.6459	357.05	0.9923	0.9207
0.1104	0.8000	0.5676	356.22	0.9885	0.8948
0.1121	0.7000	0.5196	355.00	0.9805	0.8359
0.1132	0.6000	0.4865	353.63	0.9682	0.7883
0.1133	0.5000	0.4553	352.34	0.9596	0.7335
0.1127	0.4000	0.4284	351.22	0.9422	0.6946
0.1100	0.3000	0.3867	350.44	0.9262	0.6686
0.1049	0.2000	0.3240	349.83	0.9023	0.6467
0.0964	0.1000	0.2144	349.37	0.8762	0.6317
-----			348.96	0.8449	0.6204
Isobaric phase equilibrium data			348.88	0.8078	0.6081
-----			348.67	0.7643	0.5987
Aucejo, A. - Loras, S. - Monton, J.B., Isobaric vapor-liquid equilibria of prop-2-en-1-ol (allyl alcohol) + water system at 30, 60, and 100 kPa, ELDATA: The International Electronic Journal of Physico-Chemical Data. 2 (1996) 1-4.			348.49	0.6888	0.5922
P / bar = 0.3000			348.34	0.6534	0.5802
T / K	x ₁	y ₁	348.20	0.5920	0.5648
340.33	0.9949	0.9276	348.19	0.5283	0.5453
339.41	0.9903	0.8951	348.37	0.4642	0.5233
338.22	0.9833	0.8414	348.53	0.4027	0.4961
336.85	0.9728	0.7827	348.85	0.3448	0.4669
335.58	0.9564	0.7226	349.33	0.2830	0.4258
334.38	0.9355	0.6738	350.18	0.2121	0.3645
333.90	0.9293	0.6574	351.39	0.1617	0.3050
333.56	0.9136	0.6466	352.70	0.1070	0.2289
333.25	0.9051	0.6349	353.47	0.0765	0.1737
332.82	0.8754	0.6190	354.61	0.0452	0.1092
332.55	0.8445	0.6105	Aucejo, A. - Loras, S. - Monton, J.B., Isobaric vapor-liquid equilibria of prop-2-en-1-ol (allyl alcohol) + water system at 30, 60, and 100 kPa, ELDATA: The International Electronic Journal of Physico-Chemical Data. 2 (1996) 1-4.		
332.39	0.8024	0.6046	P / bar = 1.000		
332.17	0.7527	0.5926	T / K	x ₁	y ₁
332.04	0.7064	0.6043	370.39	0.9916	0.9134
332.03	0.6461	0.5776	369.31	0.9863	0.8737
331.98	0.5817	0.5638	368.10	0.9813	0.8243
331.96	0.5108	0.5449	366.95	0.9729	0.7842
332.01	0.4555	0.5254	366.04	0.9615	0.7455
332.23	0.3911	0.4981	364.96	0.9506	0.7128
332.51	0.3318	0.4678	364.02	0.9354	0.6831
333.03	0.2680	0.4279	363.17	0.9116	0.6582
333.72	0.2198	0.3844	362.69	0.8943	0.6453
334.55	0.1710	0.3301	-----		

SA-SA systems (BAC = 9)

362.12	0.8605	0.6261
361.97	0.8248	0.6186
361.68	0.7797	0.6062
361.46	0.7245	0.5953
361.35	0.6631	0.5803
361.32	0.5888	0.5643
361.30	0.5176	0.5407
361.33	0.4633	0.5185
361.45	0.3960	0.4887
361.86	0.3355	0.4529
362.77	0.2695	0.4036
363.53	0.2136	0.3541
364.56	0.1585	0.2885
366.09	0.0965	0.1979
367.18	0.0599	0.1384
368.33	0.0288	0.0653

SA-SA systems (BAC = 9)



WATER (1) + ETHYLENEDIAMINE (2)

CAS	7732-18-5	107-15-3
InChiKey	XLYOFNOQVPJJNP-UHFFFAOYSA-N	PIICEJLVQHRZGT-UHFFFAOYSA-N
T_c / K	647.10	593.00
P_c / bar	220.64	62.90
ω	0.345	0.472

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = -376.5$

$B/\text{MPa} = -1732$

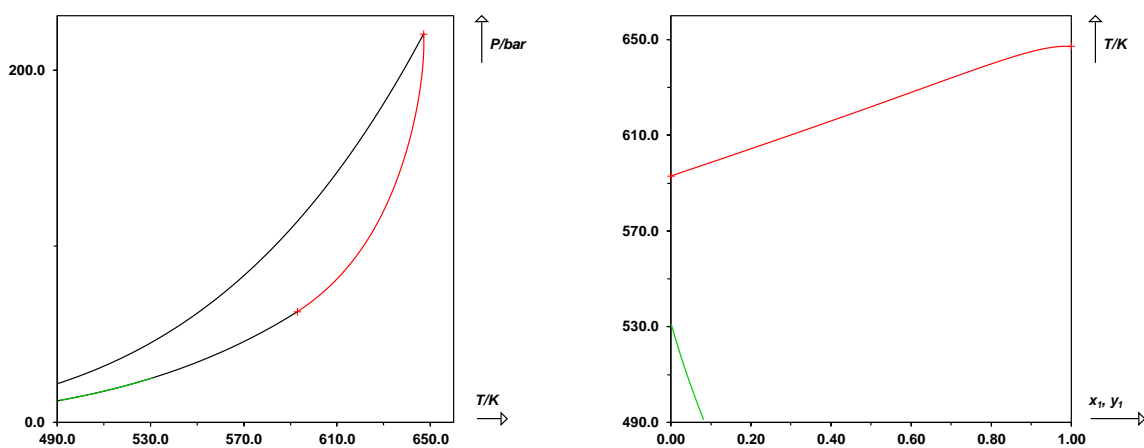
Deviations

MAPE on $x = 17\%$

MAPE on $y = 17\%$

MAPE on $x_{az} = 18\%$

MAPE on $P_{az} = 1.4\%$



-----			333.95	0.7952	0.9660		
Isobaric phase equilibrium data			331.95	0.8276	0.9835		
-----			330.35	0.8546	0.9896		
Schmelzer, J. - Quitzsd, K., Isobare Flüssigkeit-Dampfgleichgewichte der binären Systeme Benzol-Äthylendiamin und Wasser-Äthylendiamin, Zeitschrift für Physikalische Chemie. 2520 (1973) doi:10.1515/zpch-1973-25231			329.25	0.8763	0.9930		
			328.05	0.9011	0.9961		
			327.15	0.9216	0.9970		
			326.35	0.9418	0.9988		
P / bar = 0.1333			325.75	0.9604	0.9991		
T / K	x ₁	y ₁					
338.99	0.1440	0.0850					
340.04	0.2290	0.1380					
340.82	0.3010	0.2020					
341.88	0.3670	0.2790					
342.04	0.3830	0.2950					
342.46	0.4200	0.3300					
343.05	0.4780	0.4050					
343.43	0.5030	0.4620					
343.55	0.5390	0.5410					
343.57	0.5450	0.5450	AZEO				
343.45	0.5580	0.5750					
342.91	0.5900	0.6450					
342.32	0.6300	0.7420					
341.50	0.6660	0.8040					
339.72	0.7150	0.8800					
338.42	0.7480	0.9180					
332.19	0.8340	0.9850					
328.08	0.9070	0.9960					
Rivenq, F., Ebulliometry of water-ethylenediamine mixtures, Bull. Soc. Chim. Fr. 8-9 (1963) 1606-1608.							
P / bar = 0.1333							
T / K	x ₁	y ₁					
337.65	0.0788	0.0483					
339.15	0.1907	0.1022					
340.75	0.2855	0.1806					
342.25	0.3778	0.2834					
342.65	0.4437	0.3687					
342.85	0.5102	0.4744					
342.95	0.5472	0.5396					
343.05	0.5523	0.5523	AZEO				
342.85	0.5573	0.5647					
342.65	0.6227	0.7020					
341.95	0.6582	0.7743					
341.55	0.6706	0.8017					
340.65	0.6986	0.8562					
339.65	0.7131	0.8778					
338.95	0.7270	0.9020					
336.15	0.7643	0.9437					
335.15	0.7791	0.9586					
Rivenq, F., Ebulliometry of water-ethylenediamine mixtures, Bull. Soc. Chim. Fr. 8-9 (1963) 1606-1608.							
P / bar = 0.2666							
T / K	x ₁	y ₁					
353.75	0.0698	0.0514					
355.05	0.1882	0.1220					
356.15	0.2877	0.2031					
357.05	0.3849	0.3147					
357.65	0.4624	0.4177					
357.85	0.5170	0.5074					
357.95	0.5304	0.5304	AZEO				
357.85	0.5434	0.5535					
357.75	0.5707	0.6064					
357.55	0.5975	0.6591					
356.45	0.6668	0.7893					
354.85	0.6977	0.8459					
353.55	0.7270	0.8932					
353.35	0.7334	0.8960					
351.35	0.7658	0.9382					
350.05	0.7873	0.9520					
349.25	0.7979	0.9625					
347.25	0.8311	0.9796					
345.65	0.8541	0.9861					
344.15	0.8773	0.9908					
341.95	0.9224	0.9970					
341.15	0.9429	0.9982					
340.55	0.9607	0.9988					
Rivenq, F., Ebulliometry of water-ethylenediamine mixtures, Bull. Soc. Chim. Fr. 8-9 (1963) 1606-1608.							
P / bar = 0.7999							
T / K	x ₁	y ₁					
383.15	0.0728	0.0545					
383.95	0.1957	0.1599					
384.45	0.2834	0.2435					
384.95	0.3723	0.3443					
385.15	0.4373	0.4210					
385.25	0.4624	0.4624	AZEO				
385.25	0.4654	0.4684					
385.15	0.4876	0.4991					
384.95	0.5383	0.5802					

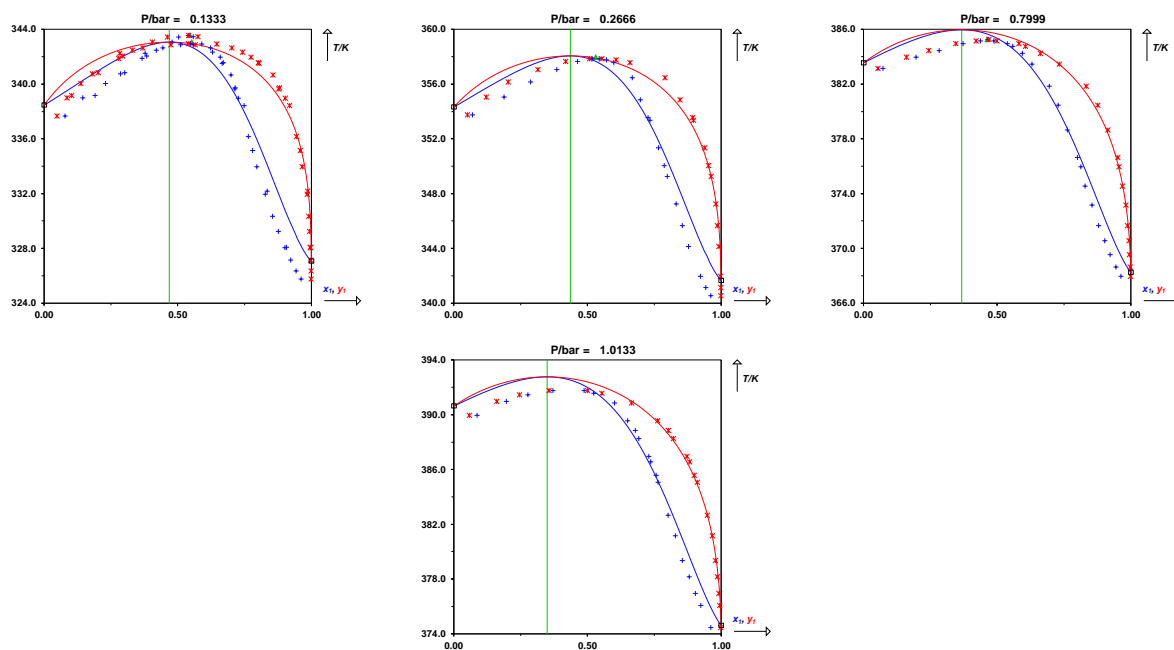
384.75	0.5585	0.6053
384.25	0.5941	0.6620
383.45	0.6300	0.7318
381.85	0.6942	0.8323
380.45	0.7278	0.8754
378.65	0.7629	0.9135
376.65	0.7991	0.9509
375.95	0.8131	0.9553
374.55	0.8287	0.9681
373.15	0.8551	0.9806
371.65	0.8793	0.9867
370.55	0.9015	0.9924
369.55	0.9224	0.9948
368.65	0.9433	0.9970
367.95	0.9621	0.9985

Ragaini, V. - Zanderighi, L. - Santi, R., The liquid-vapor equilibrium of the ethylenediamine-water system, Atti Soc. Peloritana Sci. Fis. Mat. Nat. 14 (1968) 537-548.

P / bar = 1.013

T / K	x ₁	y ₁
389.96	0.0876	0.0576
390.96	0.1957	0.1599
391.46	0.2769	0.2457
391.76	0.3705	0.3556
391.76	0.4876	0.5004
391.56	0.5238	0.5535
390.86	0.6008	0.6649
389.56	0.6493	0.7621
388.86	0.6789	0.8030
388.26	0.6915	0.8210
386.96	0.7286	0.8718
386.56	0.7365	0.8818
385.56	0.7570	0.8997
385.06	0.7636	0.9109
382.66	0.8017	0.9475
381.16	0.8287	0.9667
379.36	0.8551	0.9783
378.16	0.8803	0.9857
376.96	0.9029	0.9914
376.06	0.9229	0.9945
374.46	0.9614	0.9982

SA-SA systems (BAC = 9)



WATER (1) + 1-PENTANOL (2)

CAS	7732-18-5	71-41-0
InChiKey	XLYOFNOQVPJNP-UHFFFAOYSA-N	AMQJEAYHLZJPGS-UHFFFAOYSA-N
T_c / K	647.10	588.10
P_c / bar	220.64	38.97
ω	0.345	0.575

Deviations from ideality not assessed

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = 667.7$

$B/\text{MPa} = 527.1$

Deviations

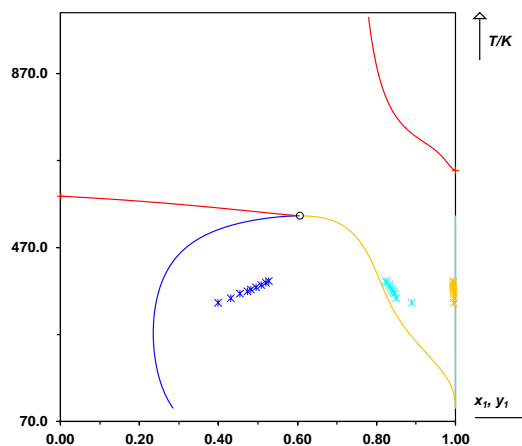
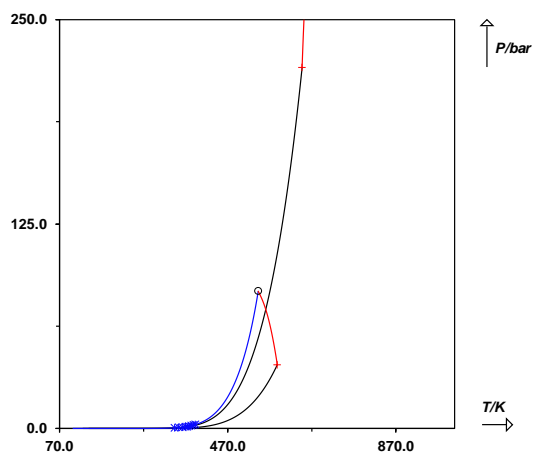
MAPE on $x = 15\%$

MAPE on $y = 14\%$

MAPE on $x_{LLV} = 35\%$

MAPE on $P_{LLV} = 1.3\%$

MAPE on $h^M = 27\%$



-----		395.14	0.0583	0.4486
Isothermal phase equilibrium data		393.43	0.0674	0.4865
-----		392.93	0.0707	0.4973
Bahlmann, M., Evaluation and revision of the modified UNIFAC (Dortmund) approach for alcohol systems (2010)		389.91	0.0895	0.5574
T / K = 323.15		388.66	0.0981	0.5809
P / bar	x ₁	385.91	0.1194	0.6300
0.1313	0.3450	383.81	0.1383	0.6646
0.1222	0.2790	381.11	0.1662	0.7072
0.1069	0.2070	379.76	0.1836	0.7271
0.0976	0.1750	377.61	0.2121	0.7568
0.0911	0.1550	375.95	0.2410	0.7797
0.0831	0.1320	375.20	0.2543	0.7896
0.0748	0.1110	373.65	0.2868	0.8092
0.0650	0.0890	373.09	0.3007	0.8163
0.0585	0.0750	370.61	0.3781	0.8460
0.0491	0.0560	369.90	0.4117	0.8541
0.0414	0.0420	369.21	0.9950	0.8681
0.0273	0.0160	369.32	0.9952	0.8708
		369.77	0.9958	0.8854
		370.70	0.9972	0.9157
Bahlmann, M., Evaluation and revision of the modified UNIFAC (Dortmund) approach for alcohol systems (2010)		371.73	0.9985	0.9507
T / K = 353.15		372.21	0.9991	0.9672

P / bar	x ₁
0.5280	0.4110
0.5014	0.3420
0.4667	0.2830
0.4173	0.2220
0.3651	0.1710
0.3088	0.1250
0.2809	0.1050

Isobaric phase equilibrium data

Cho, T.H. - Ochi, K. - Kojima, K., Isobaric vapor-liquid equilibria for binary systems with limited miscibility, water-n-amyl alcohol and water-isoamyl alcohol, Kagaku Kogaku Ronbunshu. 10 (1984) 181-183.

P / bar = 1.013		
T / K	x ₁	y ₁
410.65	0.0012	0.0170
409.19	0.0050	0.0655
407.11	0.0109	0.1319
406.37	0.0131	0.1543
404.67	0.0185	0.2052
402.96	0.0247	0.2531
401.75	0.0290	0.2860
399.84	0.0367	0.3365
398.51	0.0425	0.3704
396.82	0.0499	0.4099

Enthalpy of mixing

Marongiu, Bruno - Ferino, Italo - Monaci, Roberto - Solinas, Vincenzo - Torrazza, Sergio, Thermodynamic properties of aqueous non-electrolyte mixtures. Alkanols + water systems., Journal of Molecular Liquids. 28 (1984) 229-247. doi:10.1016/0167-7322(84)80027-6

T / K = 298.15
P / bar = UNKNOWN (1.0132)

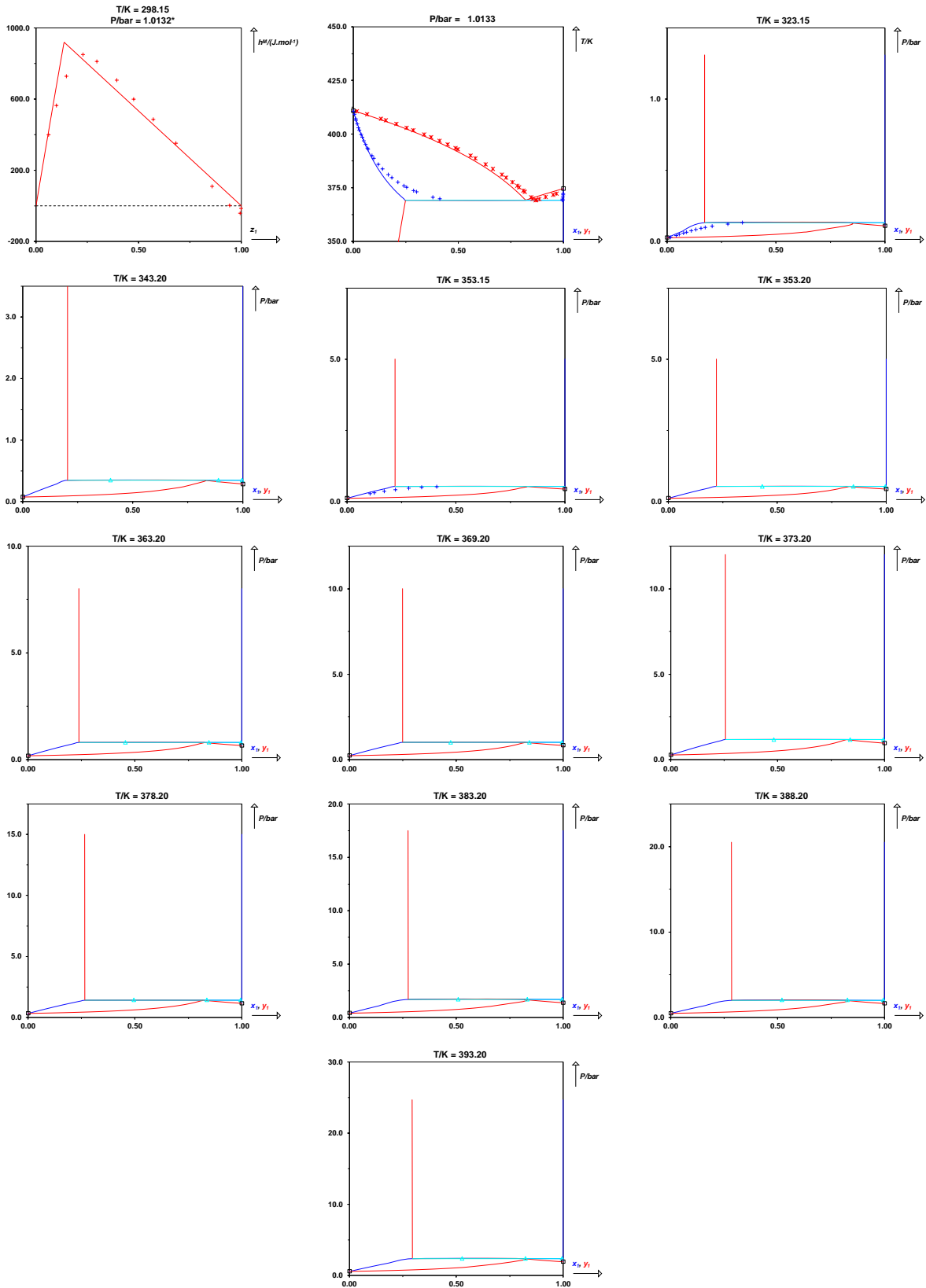
h ^M / J.mol ⁻¹	x ₁
-15.00	0.9980
-42.00	0.9941
3.000	0.9429
110.00	0.8571
351.00	0.6807
486.00	0.5715
600.00	0.4754
707.00	0.3930
812.00	0.2962
850.00	0.2286
728.00	0.1477
564.00	0.0995
400.00	0.0604

Three-phase line

Lee, Ming-Jer - Tsai, Li-Hao - Hong, Gui-Bing - Lin, Ho-mu,
Multiphase Coexistence for Aqueous Systems with Amyl
Alcohol and Amyl Acetate, Industrial & Engineering
Chemistry Research. 41 (2002) 3247-3252.
doi:10.1021/ie0105371

T / K	P / bar	x_1^{α}	x_1^{β}	y_1
343.20	0.3460	0.3982	0.9959	0.8887
353.20	0.5310	0.4305	0.9958	0.8493
363.20	0.8110	0.4547	0.9953	0.8454
369.20	1.021	0.4735	0.9950	0.8418
373.20	1.166	0.4815	0.9943	0.8394
378.20	1.451	0.4944	0.9942	0.8360
383.20	1.704	0.5087	0.9938	0.8319
388.20	2.048	0.5196	0.9937	0.8259
393.20	2.400	0.5275	0.9936	0.8229

SA-SA systems (BAC = 9)



WATER (1) + PROPYLENE GLYCOL MONOMETHYL ETHER (2)

CAS	7732-18-5	107-98-2
InChiKey	XLYOFNOQVPJNP-UHFFFAOYSA-N	ARXJGSRGQADJSQ-UHFFFAOYSA-N
T_c / K	647.10	579.80
P_c / bar	220.64	41.13
ω	0.345	0.443

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

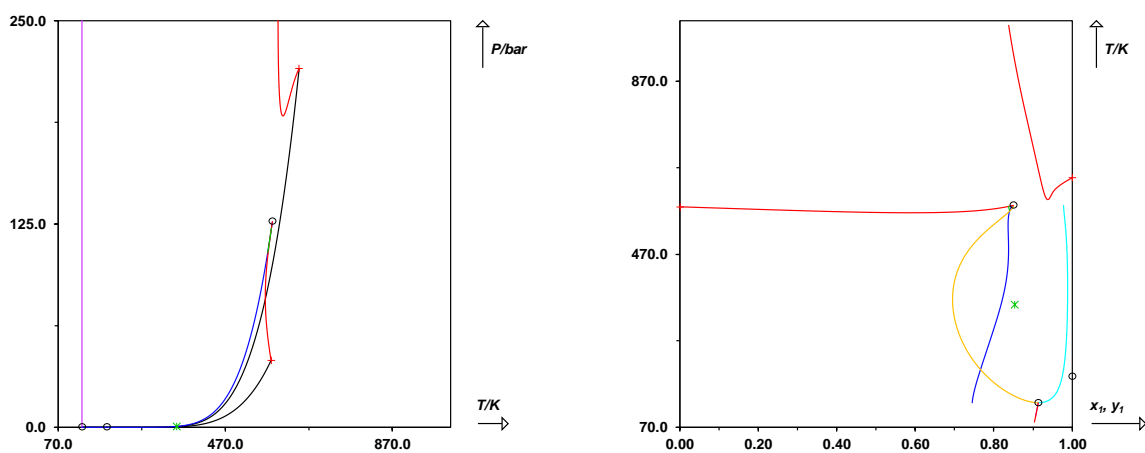
$A/\text{MPa} = 289.3$

$B/\text{MPa} = -80.83$

Deviations

MAPE on $x = 22\%$

MAPE on $y = 5.2\%$



Isothermal phase equilibrium data

Chiavone-Filho, Osvaldo - Proust, Patricio - Rasmussen, Peter, Vapor-liquid equilibria for glycol ether + water systems, Journal of Chemical & Engineering Data. 38 (1993) 128-131. doi:10.1021/je00009a031

T / K = 353.15

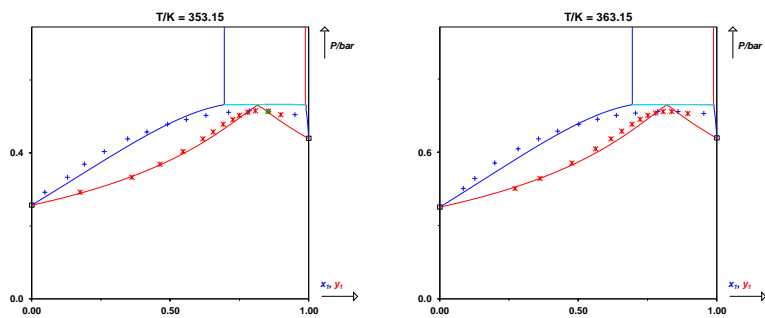
P / bar	x ₁	y ₁	
0.2923	0.0471	0.1746	
0.3330	0.1285	0.3623	
0.3690	0.1895	0.4629	
0.4043	0.2617	0.5453	
0.4383	0.3470	0.6171	
0.4575	0.4150	0.6547	
0.4781	0.4908	0.6906	
0.4917	0.5580	0.7255	
0.5024	0.6289	0.7488	
0.5111	0.7112	0.7792	
0.5150	0.7859	0.8074	
0.5146	0.8534	0.8534	AZEO
0.5146	0.8564	0.8544	
0.5045	0.9499	0.8982	

Chiavone-Filho, Osvaldo - Proust, Patricio - Rasmussen, Peter, Vapor-liquid equilibria for glycol ether + water systems, Journal of Chemical & Engineering Data. 38 (1993) 128-131. doi:10.1021/je00009a031

T / K = 363.15

P / bar	x ₁	y ₁
0.4526	0.0844	0.2723
0.4934	0.1268	0.3611
0.5553	0.1982	0.4770
0.6138	0.2822	0.5620
0.6547	0.3564	0.6183
0.6865	0.4249	0.6572
0.7141	0.5013	0.6933
0.7357	0.5691	0.7236
0.7517	0.6375	0.7508
0.7605	0.7063	0.7778
0.7669	0.7861	0.8061
0.7668	0.8604	0.8364
0.7590	0.9524	0.8954

SA-SA systems (BAC = 9)



WATER (1) + PHENOL (2)

CAS	7732-18-5	108-95-2
InChiKey	XLYOFNOQVPJNP-UHFFFAOYSA-N	ISWSIDIOOBJQZ-UHFFFAOYSA-N
T_c / K	647.10	694.25
P_c / bar	220.64	61.30
ω	0.345	0.443

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 300.8$$

$$B/\text{MPa} = 137.3$$

Deviations

$$\text{MAPE on } x = 26 \%$$

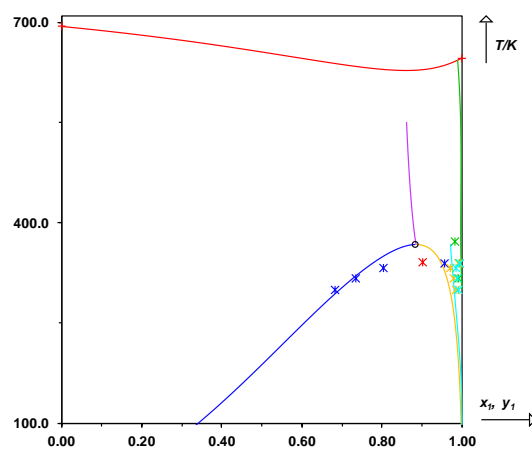
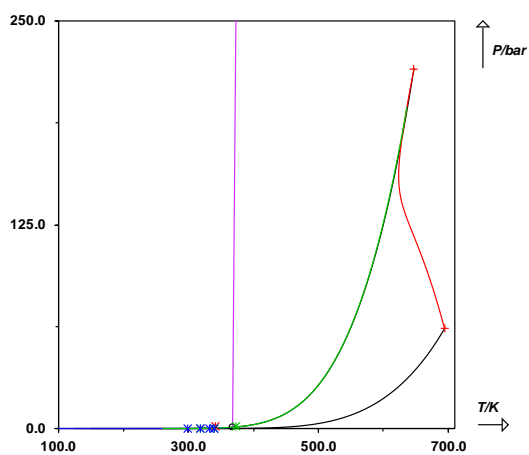
$$\text{MAPE on } y = 25 \%$$

$$\text{MAPE on } z_{\text{LLV}} = 60 \%$$

$$\text{MAPE on } P_{\text{LLV}} = 11 \%$$

$$\text{MAPE on } h^{\text{M}} = 22 \%$$

$$\text{MAPE on } c_p^{\text{M}} = 56 \%$$



Isothermal phase equilibrium data								
-----				339.55	-	0.9930	0.9930	AZEO
Isothermal phase equilibrium data				339.60	-	0.9950	0.9940	
-----				339.65	-	0.9975	0.9960	
Weller, Rolf - Schubert, Horst - Leibnitz, Eberhard, Phasengleichgewichtsmessungen. IV. Die Phasengleichgewichte dampfförmig/flüssig des Systems Phenol/n-Butylacetat/Wasser bei 44,4°C, Journal für Praktische Chemie. 21 (1963) 234-249. doi:10.1002/prac.19630210502				von Erichsen, L. - Dobbert, E., The mutual solubility behavior of alkylphenols and water, Brennstoff-Chemie. 21-22 (1955) 338-345.				
T / K =	317.55			P / bar =	1.013			
P / bar	x ₁ ^α	x ₁ ^β	y ₁	T / K	x ₁ ^α	x ₁ ^β		
0.0120	0.0501	-	0.8248	273.15	0.6302	0.9852		
0.0195	0.0963	-	0.8977	283.15	0.6497	0.9847		
0.0280	0.1391	-	0.9329	293.15	0.6734	0.9838		
0.0381	0.1787	-	0.9559	303.15	0.6983	0.9823		
0.0453	0.2156	-	0.9656	313.15	0.7255	0.9799		
0.0544	0.2500	-	0.9727	323.15	0.7566	0.9757		
0.0640	0.2975	-	0.9769	333.15	0.8015	0.9666		
0.0741	0.3672	-	0.9801	335.15	0.8116	0.9633		
0.0800	0.4273	-	0.9821	337.15	0.8242	0.9589		
0.0837	0.4796	-	0.9830	339.15	0.8452	0.9502		
0.0867	0.5256	-	0.9836	340.15	0.8608	0.9394		
0.0883	0.5663	-	0.9843	341.15	0.8839	0.9188		
0.0895	0.5998	-	0.9849	341.45	0.9009	0.9009	CRIT	
0.0927	0.7002	-	0.9864	Chou, C.H. - Perng, J.L. - Lee, M.D. - Chen, Y.P., Vapor-liquid equilibrium measurements of the ternary system of ethanol, water and phenol at 760mmHg, J. Chin. Inst. Chem. Eng. 18 (1987) 393-399.				
0.0935	0.7334	0.9787	0.9871	3PL	P / bar =	1.013		
0.0935	-	0.9911	0.9911	AZEO	T / K	x ₁	y ₁	
0.0935	-	0.9953	0.9939		454.55	0.0001	0.0075	
0.3920	0.9473	0.9806		447.51	0.0154	0.2940		
0.3920	0.9628	0.9812		413.05	0.1019	0.7827		
0.3920	0.9847	0.9849		385.97	0.3087	0.9397		
0.3906	0.9918	0.9895		380.83	0.3838	0.9509		
0.3906	0.9953	0.9932		374.41	0.5679	0.9736		
-----				373.17	0.7215	0.9778		
Isobaric phase equilibrium data				373.00	0.8088	0.9786		
-----				372.97	0.9353	0.9787		
Kliment, V. - Fried, V. - Pick, J., Liquid-vapor equilibrium. XXXIII. The systems butyl acetate-phenol and water-phenol, Collect. Czech. Chem. Commun. 29 (1964) 2008-2015.				372.95	0.9427	0.9787		
P / bar =	0.2666			372.95	0.9741	0.9805		
T / K	x ₁ ^α	x ₁ ^β	y ₁	372.90	0.9820	0.9820	AZEO	
399.65	0.0040	-	0.3740	372.92	0.9847	0.9839		
385.35	0.0290	-	0.6530	372.97	0.9938	0.9907		
368.70	0.1290	-	0.8755	-----				
364.45	0.1710	-	0.9190	Enthalpy of mixing				
363.05	0.1820	-	0.9230	-----				
353.45	0.2910	-	0.9460	Schuermann, E. - Diederichs, R., Heats of mixing of phenol-water systems, Ber. Bunsen-Ges. Phys. Chem. 68 (1964) 429-434.				
351.90	0.3180	-	0.9520	T / K =	323.15			
344.40	0.5000	-	0.9740	P / bar =	UNKNOWN (1.0132)			
341.45	0.5780	-	0.9770	h ^M / J.mol ⁻¹	x ₁			
340.75	0.6130	-	0.9790	467.67	0.2174			
340.20	0.6600	-	0.9810	714.12	0.3680			
340.00	0.6880	-	0.9830	814.61	0.4825			
339.65	0.9430	-	0.9920	826.13	0.5667			
339.55	0.9570	0.9920	0.9930	790.69	0.6344			
			3PL					

739.58	0.6906	380.64	0.2156
667.07	0.7359	664.50	0.3677
602.10	0.7759	818.87	0.4741
451.44	0.8399	873.16	0.5650
333.61	0.8878	896.09	0.6319
250.74	0.9245	854.60	0.6905
178.86	0.9547	827.12	0.7366
148.05	0.9682	764.86	0.7760
56.63	0.9899	705.16	0.8079

Schuermann, E. - Diederichs, R., Heats of mixing of phenol-water systems, Ber. Bunsen-Ges. Phys. Chem. 68 (1964) 429-434.

T / K = 333.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
432.45	0.2084
696.90	0.3687
794.88	0.4784
848.45	0.5643
769.13	0.6881
720.34	0.7377
649.74	0.7764
503.59	0.8386
386.71	0.8870
296.65	0.9233
213.24	0.9544
128.78	0.9793
61.25	0.9903

Schuermann, E. - Diederichs, R., Heats of mixing of phenol-water systems, Ber. Bunsen-Ges. Phys. Chem. 68 (1964) 429-434.

T / K = 343.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
396.42	0.2084
673.97	0.3698
811.58	0.4786
846.31	0.5660
869.83	0.6004
856.47	0.6340
796.97	0.6918
785.69	0.7007
778.68	0.7168
693.79	0.7774
558.29	0.8385
420.82	0.8998
266.79	0.9500
192.98	0.9700
101.73	0.9854

Schuermann, E. - Diederichs, R., Heats of mixing of phenol-water systems, Ber. Bunsen-Ges. Phys. Chem. 68 (1964) 429-434.

T / K = 358.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

632.51	0.8405
510.21	0.8864
402.10	0.9236
293.04	0.9538
169.28	0.9789
84.09	0.9901

Heat capacity of mixing

Ferguson, J. B., The System Water-Phenol, The Journal of Physical Chemistry. 31 (1926) 757-763.
doi:10.1021/j150275a013

T / K = 345.15
P / bar = UNKNOWN (1.0132)

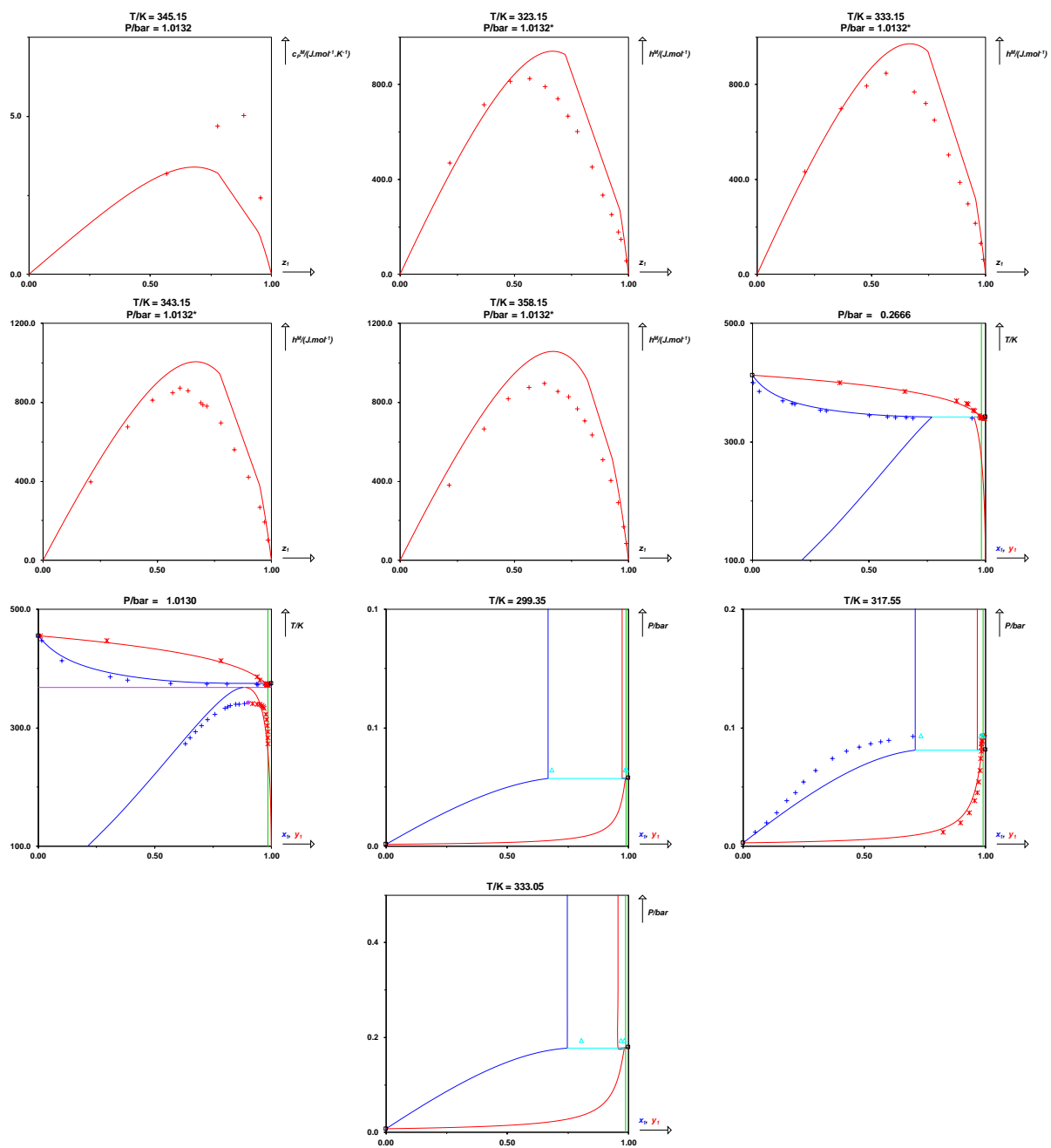
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
3.173	0.5678
4.686	0.7767
5.027	0.8862
2.426	0.9542

Three-phase line

Campbell, Alan N. - Campbell, A. Jean R., Concentrations, Total and Partial Vapor Pressures, Surface Tensions and Viscosities, in the Systems Phenol—Water and Phenol—Water—4% Succinic Acid, Journal of the American Chemical Society. 59 (1937) 2481-2488.
doi:10.1021/ja01291a001

T / K	P / bar	x_1^a	x_1^b	y_1
299.35	0.0323	0.6830	0.9847	0.9915
333.05	0.1935	0.8041	0.9698	0.9839

SA-SA systems (BAC = 9)



WATER (1) + 2-BUTOXYETHANOL (2)

CAS	7732-18-5	111-76-2
InChiKey	XLYOFNOQVPJNP-UHFFFAOYSA-N	POAOYUHQDCAZBD-UHFFFAOYSA-N
T_c / K	647.10	633.90
P_c / bar	220.64	32.70
ω	0.345	0.514

Non-ideal with entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$$A/\text{MPa} = 252.8$$

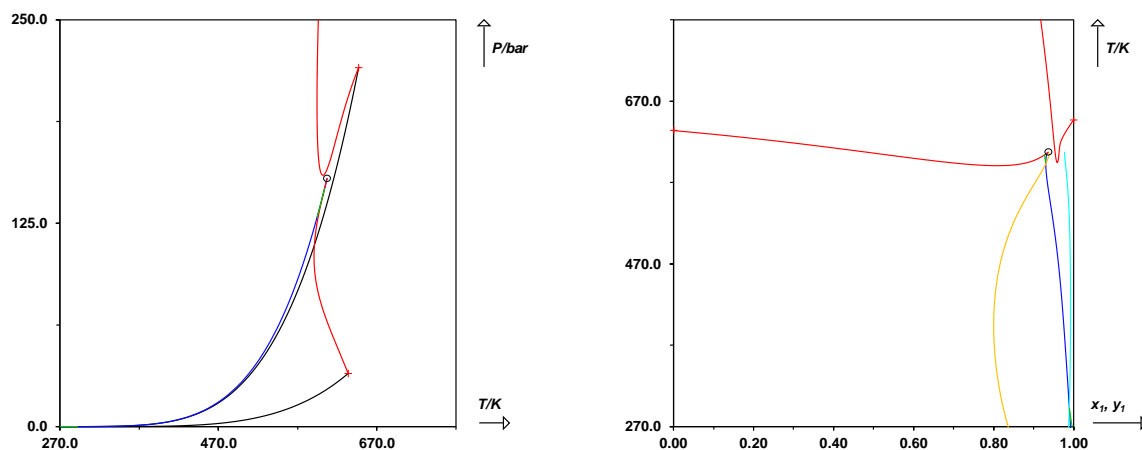
$$B/\text{MPa} = -88.30$$

Deviations

$$\text{MAPE on } x = 46\%$$

$$\text{MAPE on } y = 54\%$$

$$\text{MAPE on } h^M = 55\%$$



-----			0.0622	0.0724	0.7665
Isothermal phase equilibrium data			0.1023	0.1446	0.8684
-----			0.1348	0.2105	0.9061
Scatchard, George. - Wilson, Grant M., Vapor-Liquid Equilibrium. XIII. The System Water-Butyl Glycol from 5 to 85°, Journal of the American Chemical Society. 86 (1964) 133-137. doi:10.1021/ja01056a004			0.1736	0.3036	0.9332
T / K = 278.15			0.2291	0.5046	0.9583
P / bar	x ₁	y ₁	0.2509	0.6822	0.9670
0.0019	0.0742	0.8923	0.2553	0.7878	0.9690
0.0032	0.1477	0.9432	Chiavone-Filho, Osvaldo - Proust, Patricio - Rasmussen, Peter, Vapor-liquid equilibria for glycol ether + water systems, Journal of Chemical & Engineering Data. 38 (1993) 128-131. doi:10.1021/je00009a031		
0.0044	0.2139	0.9603	T / K = 358.15		
0.0057	0.3073	0.9721	P / bar	x ₁	y ₁
0.0075	0.5072	0.9827	0.0538	0.0188	0.2160
0.0082	0.6836	0.9864	0.0642	0.0257	0.3416
0.0085	0.7885	0.9874	0.0753	0.0338	0.4366
0.0086	0.8986	0.9880	0.0881	0.0442	0.5233
Scatchard, George. - Wilson, Grant M., Vapor-Liquid Equilibrium. XIII. The System Water-Butyl Glycol from 5 to 85°, Journal of the American Chemical Society. 86 (1964) 133-137. doi:10.1021/ja01056a004			0.1019	0.0537	0.5924
T / K = 298.15			0.1236	0.0735	0.6730
P / bar	x ₁	y ₁	0.1466	0.0935	0.7279
0.0072	0.0741	0.8526	0.1747	0.1208	0.7729
0.0123	0.1473	0.9206	0.2197	0.1595	0.8293
0.0165	0.2135	0.9441	0.3035	0.2404	0.8855
0.0212	0.3069	0.9606	0.3837	0.3205	0.9126
0.0280	0.5068	0.9755	0.4546	0.3973	0.9339
0.0308	0.6834	0.9806	0.5258	0.5150	0.9472
Scatchard, George. - Wilson, Grant M., Vapor-Liquid Equilibrium. XIII. The System Water-Butyl Glycol from 5 to 85°, Journal of the American Chemical Society. 86 (1964) 133-137. doi:10.1021/ja01056a004			0.5724	0.6441	0.9564
T / K = 318.15			0.5909	0.7609	0.9590
P / bar	x ₁	y ₁	0.5950	0.9812	0.9609
0.0230	0.0734	0.8103	Scatchard, George. - Wilson, Grant M., Vapor-Liquid Equilibrium. XIII. The System Water-Butyl Glycol from 5 to 85°, Journal of the American Chemical Society. 86 (1964) 133-137. doi:10.1021/ja01056a004		
0.0384	0.1465	0.8957	T / K = 358.15		
0.0510	0.2125	0.9261	P / bar	x ₁	y ₁
0.0658	0.3058	0.9477	0.1466	0.0703	0.7193
0.0866	0.5061	0.9673	0.2369	0.1413	0.8380
0.0936	0.6833	0.9742	0.3108	0.2067	0.8836
0.0966	0.7882	0.9757	0.4006	0.2992	0.9168
0.0972	0.8985	0.9752	0.5325	0.5016	0.9481
Scatchard, George. - Wilson, Grant M., Vapor-Liquid Equilibrium. XIII. The System Water-Butyl Glycol from 5 to 85°, Journal of the American Chemical Society. 86 (1964) 133-137. doi:10.1021/ja01056a004			0.5853	0.6806	0.9591
T / K = 338.15			0.5944	0.7870	0.9616
P / bar	x ₁	y ₁	Escobedo-Alvarado, Gonzalo N. - Sandler, Stanley I., Vapor-Liquid Equilibrium of Two Aqueous Systems that Exhibit Liquid-Liquid Phase Separation, Journal of Chemical & Engineering Data. 44 (1999) 319-322. doi:10.1021/je980228q		
-----			T / K = 363.18		

SA-SA systems (BAC = 9)

P / bar	x ₁	y ₁	T / K =	371.19		
0.0946	0.0243	0.4436	P / bar	x ₁	y ₁	
0.1391	0.0499	0.6153	0.1195	0.0223	0.3604	
0.1619	0.0677	0.6861	0.1357	0.0284	0.4302	
0.2179	0.1084	0.7942	0.1747	0.0477	0.5664	
0.2596	0.1358	0.8364	0.2059	0.0672	0.6401	
0.3079	0.1726	0.8688	0.2619	0.0970	0.7246	
0.3997	0.2444	0.9097	0.3341	0.1330	0.7907	
0.4470	0.2783	0.9191	0.3985	0.1652	0.8312	
0.4953	0.3154	0.9288	0.4810	0.2061	0.8674	
0.5459	0.3651	0.9355	0.5549	0.2482	0.8928	
0.5820	0.4040	0.9391	0.6237	0.2897	0.9101	
0.6217	0.4571	0.9435	0.7031	0.3429	0.9252	
0.6468	0.4958	0.9472	0.7739	0.3985	0.9355	
0.6685	0.5414	0.9492	0.8295	0.4546	0.9427	
0.6978	0.6292	0.9545	0.9218	0.5991	0.9590	
0.7088	0.6642	0.9554	0.9540	0.6952	0.9626	
0.7190	0.7415	0.9628	0.9623	0.7251	0.9653	
0.7237	0.7798	0.9656	0.9705	0.7554	0.9664	
0.7258	0.8126	0.9661	0.9800	0.9839	0.9665	
0.7247	0.9887	0.9697	0.9774	0.9888	0.9670	
0.7175	0.9942	0.9803	0.9709	0.9928	0.9719	
0.7085	0.9976	0.9893	0.9673	0.9946	0.9753	
			0.9555	0.9976	0.9872	

Chivone-Filho, Osvaldo - Proust, Patricio - Rasmussen, Peter, Vapor-liquid equilibria for glycol ether + water systems, Journal of Chemical & Engineering Data. 38 (1993) 128-131. doi:10.1021/je00009a031

T / K =	368.15		
P / bar	x ₁	y ₁	
0.0871	0.0196	0.2165	
0.1020	0.0272	0.3334	
0.1201	0.0344	0.4329	
0.1389	0.0486	0.5132	
0.1647	0.0597	0.5993	
0.1992	0.0790	0.6787	
0.2385	0.1072	0.7352	
0.2932	0.1468	0.7906	
0.3794	0.2034	0.8431	
0.4770	0.2707	0.8806	
0.6162	0.3626	0.9194	
0.7508	0.4867	0.9419	
0.8332	0.6249	0.9503	
0.8662	0.7486	0.9567	
0.8720	0.9837	0.9590	

Escobedo-Alvarado, Gonzalo N. - Sandler, Stanley I., Vapor-Liquid Equilibrium of Two Aqueous Systems that Exhibit Liquid-Liquid Phase Separation, Journal of Chemical & Engineering Data. 44 (1999) 319-322. doi:10.1021/je980228q

Isobaric phase equilibrium data

Aizpiri, Arturo G. - Monroy, Francisco - del Campo, Carlos - Rubio, Ramón G. - Díaz Peña, Mateo, Range of simple scaling and critical amplitudes near a LCST. The 2-butoxyethanol + water system, Chemical Physics. 165 (1992) 31-39. doi:10.1016/0301-0104(92)80040-3

P / bar =	UNKNOWN (10.00)		
T / K	x ₁ ^a	x ₁ ^b	
407.67	-	0.9413	
407.56	0.9361	-	
407.51	0.9324	-	
407.45	0.9379	-	
407.35	0.9398	-	
407.27	0.9276	-	
407.23	0.9232	-	
407.21	0.9187	-	
407.10	-	0.9502	
407.07	0.9150	-	
406.89	0.9089	-	
406.52	-	0.9492	
406.19	0.8982	-	
405.18	0.8889	-	
404.82	-	0.9609	

SA-SA systems (BAC = 9)

404.67	-	0.9610	324.36	0.8932	-
403.43	0.8791	-	324.28	0.8940	-
402.36	-	0.9668	324.01	-	0.9682
401.86	0.8687	-	323.99	0.8970	-
401.79	-	0.9682	323.97	0.8955	-
399.13	-	0.9721	323.76	0.8982	-
398.95	0.8575	-	323.67	-	0.9668
396.60	-	0.9739	323.60	0.9016	-
396.59	0.8500	-	323.29	0.9052	-
393.29	0.8396	-	323.11	-	0.9635
391.46	-	0.9774	322.94	0.9093	-
388.43	-	0.9787	322.87	-	0.9610
387.20	0.8267	-	322.87	-	0.9609
376.03	-	0.9821	322.77	0.9150	-
374.33	-	0.9826	322.75	0.9154	-
373.51	0.8142	-	322.64	0.9187	-
370.05	-	0.9830	322.63	-	0.9572
357.87	0.8111	-	322.52	0.9232	-
352.53	0.8142	-	322.49	-	0.9538
346.90	0.8185	-	322.49	0.9263	-
344.68	0.8222	-	322.45	-	0.9516
343.13	-	0.9831	322.45	0.9276	-
342.75	-	0.9830	322.43	-	0.9502
342.21	0.8267	-	322.42	-	0.9492
340.42	-	0.9826	322.42	0.9305	-
339.89	0.8307	-	322.42	-	0.9486
338.67	0.8335	-	322.41	0.9324	-
338.27	-	0.9821	322.39	-	0.9437
337.85	0.8348	-	322.39	0.9367	-
336.18	0.8396	-	322.39	0.9379	-
334.55	0.8439	-	322.39	0.9361	-
332.75	0.8500	-	322.38	-	0.9413
330.71	0.8575	-	322.38	0.9391	-
330.58	-	0.9787	322.37	0.9357	-
330.00	0.8599	-	322.37	-	0.9398
329.14	-	0.9774	322.37	-	0.9422
328.87	0.8649	-			
328.11	0.8687	-			
327.51	-	0.9765			
327.32	0.8727	-			
326.83	-	0.9752			
326.23	0.8791	-			
326.17	-	0.9739			
325.63	0.8824	-			
325.40	0.8829	-			
325.23	-	0.9721			
325.07	0.8869	-			
324.84	0.8890	-			
324.49	-	0.9700			

Enthalpy of mixing

Onken, U., Die thermodynamischen Funktionen des Systems Wasser/Butylglykol, Z. Elektrochem. 63 (1959) 321-327.

T / K =	293.15
P / bar =	UNKNOWN (1.0132)
$h^M / J.mol^{-1}$	x_1
-297.68	0.4238
-406.54	0.5805
-495.30	0.7007
-499.90	0.7087

SA-SA systems (BAC = 9)

-500.74	0.8017	-68.83	0.9928
-426.22	0.9091	-57.31	0.9943
-311.71	0.9656	-43.70	0.9958
		-30.83	0.9972

Lim, Kyung-Hee - Whiting, Wallace B. - Smith, Duane H.,
Excess Enthalpies and Liquid-Liquid Equilibrium Phase
Compositions of the Nonionic Amphiphile 2-
Butoxyethanol and Water, Journal of Chemical &
Engineering Data. 39 (1994) 399-403.
doi:10.1021/je00014a048

T / K = 321.62

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

-0.6500	0.0684
-14.01	0.1835
-46.68	0.3168
-122.16	0.4467
-159.43	0.5205
-189.58	0.5805
-218.44	0.6449
-239.54	0.6965
-246.38	0.7185
-250.93	0.7386
-253.33	0.7569
-254.13	0.7737
-254.25	0.7892
-252.81	0.8034
-250.12	0.8166
-246.69	0.8289
-240.62	0.8403
-236.68	0.8509
-231.27	0.8609
-226.53	0.8702
-220.62	0.8790
-215.31	0.8873
-209.13	0.8951
-194.22	0.9127
-181.02	0.9281
-167.12	0.9418
-154.44	0.9539
-141.96	0.9647
-137.23	0.9687
-131.99	0.9726
-126.92	0.9763
-120.93	0.9798
-113.99	0.9833
-104.11	0.9866
-98.38	0.9882
-89.11	0.9898
-79.52	0.9913

Lim, Kyung-Hee - Whiting, Wallace B. - Smith, Duane H.,
Excess Enthalpies and Liquid-Liquid Equilibrium Phase
Compositions of the Nonionic Amphiphile 2-
Butoxyethanol and Water, Journal of Chemical &
Engineering Data. 39 (1994) 399-403.
doi:10.1021/je00014a048

T / K = 328.12

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

-2.680	0.0683
-10.72	0.1834
-29.80	0.3167
-65.63	0.4465
-94.94	0.5204
-122.59	0.5804
-151.59	0.6448
-173.01	0.6963
-180.42	0.7184
-185.78	0.7385
-189.32	0.7568
-191.43	0.7736
-192.56	0.7891
-192.27	0.8033
-191.00	0.8165
-189.01	0.8288
-185.17	0.8402
-182.51	0.8508
-178.27	0.8608
-172.78	0.8702
-166.55	0.8790
-161.00	0.8872
-155.31	0.8950
-143.02	0.9126
-133.28	0.9281
-123.59	0.9417
-114.90	0.9538
-107.13	0.9647
-104.28	0.9687
-101.23	0.9726
-98.50	0.9763
-95.07	0.9798
-90.74	0.9833
-84.27	0.9866
-79.49	0.9882
-72.55	0.9897

SA-SA systems (BAC = 9)

-65.11	0.9913	-59.90	0.9763
-56.42	0.9928	-58.67	0.9798
-46.69	0.9943	-56.93	0.9833
-36.10	0.9958	-53.95	0.9866
-23.61	0.9972	-51.52	0.9882
-12.72	0.9986	-47.93	0.9898

Lim, Kyung-Hee - Whiting, Wallace B. - Smith, Duane H.,
 Excess Enthalpies and Liquid-Liquid Equilibrium Phase
 Compositions of the Nonionic Amphiphile 2-
 Butoxyethanol and Water, Journal of Chemical &
 Engineering Data. 39 (1994) 399-403.
 doi:10.1021/je00014a048

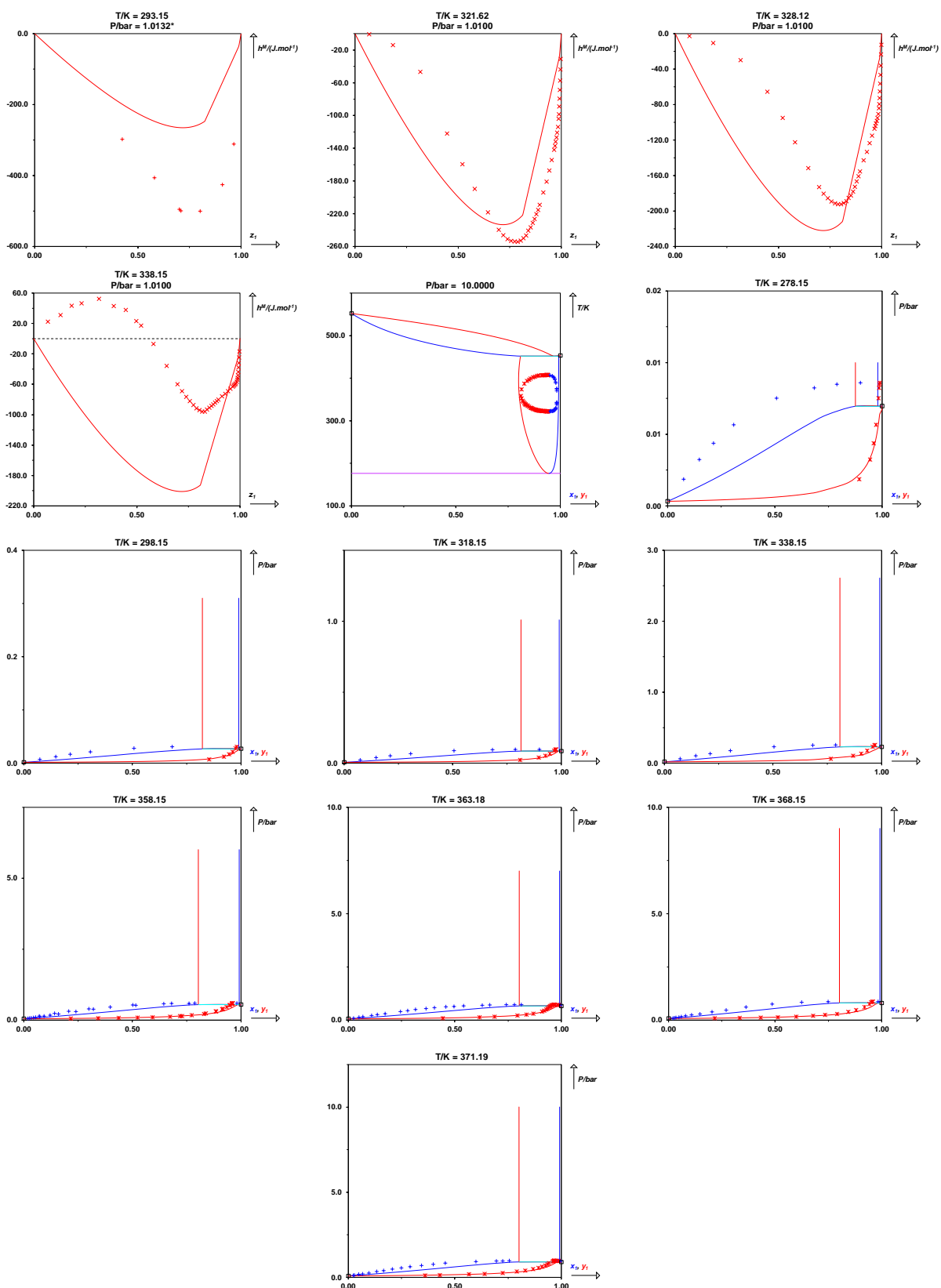
T / K = 338.15

P / bar = 1.010

$h^M / \text{J}\cdot\text{mol}^{-1}$

z ₁	
22.13	0.0684
30.99	0.1291
43.18	0.1835
46.29	0.2324
52.33	0.3168
42.84	0.3872
37.74	0.4467
23.04	0.4977
16.99	0.5205
-6.940	0.5805
-35.90	0.6449
-59.92	0.6965
-69.12	0.7185
-76.65	0.7386
-82.17	0.7569
-87.40	0.7737
-91.47	0.7892
-93.90	0.8034
-95.82	0.8166
-95.92	0.8289
-93.17	0.8403
-90.93	0.8509
-88.51	0.8609
-86.35	0.8702
-84.12	0.8790
-82.19	0.8873
-80.17	0.8951
-75.77	0.9127
-72.48	0.9281
-69.05	0.9418
-66.06	0.9539
-63.06	0.9647
-62.02	0.9687
-60.85	0.9726

SA-SA systems (BAC = 9)



METHANOL (1) + WATER (2)

CAS	67-56-1	7732-18-5
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	XLYOFNOQVPJJNP-UHFFFAOYSA-N
T_c / K	512.50	647.10
P_c / bar	80.84	220.64
ω	0.566	0.345

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 205.2$$

$$B/\text{MPa} = -271.8$$

Deviations

$$\text{MAPE on } x = 31\%$$

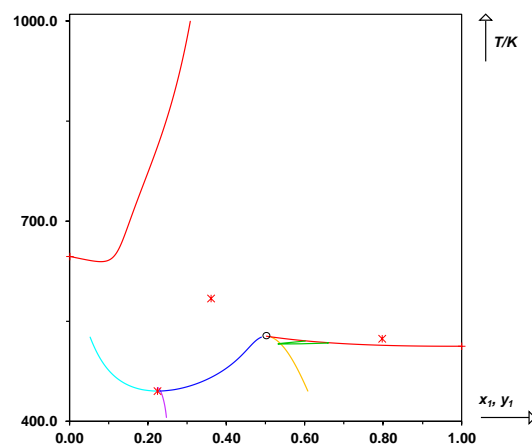
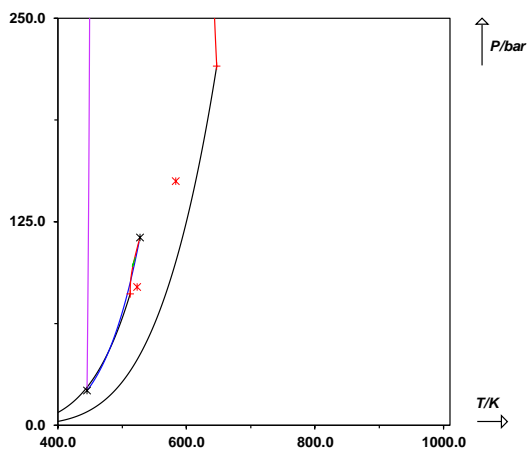
$$\text{MAPE on } y = 17\%$$

$$\text{MAPE on } x_c = 74\%$$

$$\text{MAPE on } P_c = 28\%$$

$$\text{MAPE on } h^M = 27\%$$

$$\text{MAPE on } c_p^M = 200\%$$



Isothermal phase equilibrium data

Jinyan Fu - Kun Wang - Ying Hu, Studies on the Vapor-Liquid Equilibrium and Vapor-Liquid-Liquid Equilibrium for a Methanol-Methyl Methacrylate-WaterTernary System (I) Three Different Binary Systems, Huagong Xuebao. 39 (1988) 64-76.

T / K = 298.15		
P / bar	x ₁	y ₁
0.0565	0.1029	0.5002
0.0757	0.2021	0.6533
0.0916	0.3032	0.7370
0.1033	0.4028	0.7927
0.1137	0.5019	0.8360
0.1252	0.6096	0.8760
0.1357	0.7073	0.9089
0.1457	0.8016	0.9390
0.1575	0.9000	0.9695

Maximo, Guilherme J. - Meirelles, Antonio J.A. - Batista, Eduardo A.C., Boiling point of aqueous d-glucose and d-fructose solutions: Experimental determination and modeling with group-contribution method, Fluid Phase Equilibria. 299 (2010) 32-41. doi:10.1016/j.fluid.2010.08.018

T / K = 298.15		
P / bar	x ₁	y ₁
0.0583	0.1000	0.5070
0.0760	0.2000	0.6540
0.0900	0.3000	0.7330
0.1020	0.4000	0.7890
0.1133	0.5000	0.8330
0.1243	0.6000	0.8710
0.1352	0.7000	0.9060
0.1461	0.8000	0.9390
0.1575	0.9000	0.9700

Jinyan Fu - Kun Wang - Ying Hu, Studies on the Vapor-Liquid Equilibrium and Vapor-Liquid-Liquid Equilibrium for a Methanol-Methyl Methacrylate-WaterTernary System (I) Three Different Binary Systems, Huagong Xuebao. 39 (1988) 64-76.

T / K = 308.15		
P / bar	x ₁	y ₁
0.0981	0.1029	0.4872
0.1291	0.2021	0.6394
0.1545	0.3032	0.7234
0.1736	0.4028	0.7801
0.1903	0.5019	0.8247
0.2084	0.6096	0.8666
0.2253	0.7073	0.9014

0.2416	0.8016	0.9336
0.2601	0.9000	0.9666

McGlashan, M. L. - Williamson, A. G., Isothermal liquid-vapor equilibriums for system methanol-water, Journal of Chemical & Engineering Data. 21 (1976) 196-199. doi:10.1021/je60069a019

T / K = 308.15		
P / bar	x ₁	y ₁
0.0733	0.0408	0.2490
0.1087	0.1387	0.5274
0.1401	0.2488	0.6738
0.1640	0.3603	0.7559
0.1835	0.4694	0.8084
0.2058	0.6012	0.8611
0.2268	0.7239	0.9071
0.2398	0.7951	0.9316
0.2576	0.8880	0.9636
0.2586	0.9005	0.9683
0.2681	0.9406	0.9815

Jinyan Fu - Kun Wang - Ying Hu, Studies on the Vapor-Liquid Equilibrium and Vapor-Liquid-Liquid Equilibrium for a Methanol-Methyl Methacrylate-WaterTernary System (I) Three Different Binary Systems, Huagong Xuebao. 39 (1988) 64-76.

T / K = 318.15		
P / bar	x ₁	y ₁
0.1639	0.1029	0.4750
0.2125	0.2021	0.6260
0.2516	0.3032	0.7103
0.2813	0.4028	0.7679
0.3073	0.5019	0.8137
0.3354	0.6096	0.8573
0.3618	0.7073	0.8940
0.3868	0.8016	0.9283
0.4148	0.9000	0.9638

Yao, Jia - Li, Haoran - Han, Shijun, Vapor-liquid equilibrium data for methanol-water-NaCl at 45°C, Fluid Phase Equilibria. 162 (1999) 253-260. doi:10.1016/S0378-3812(99)00204-6

T / K = 318.15		
P / bar	x ₁	y ₁
0.1477	0.0753	0.3986
0.1819	0.1358	0.5384
0.2189	0.2171	0.6466
0.2476	0.2926	0.7082
0.2767	0.3805	0.7641
0.3007	0.4731	0.8073
0.3258	0.5563	0.8397

SA-SA systems (BAC = 9)

0.3518 0.6507 0.8743
 0.3814 0.7604 0.9136
 0.4095 0.8739 0.9538
 0.4278 0.9354 0.9773

Kurihara, Kiyofumi - Minoura, Tsuyoshi - Takeda, Kouichi - Kojima, Kazuo, Isothermal Vapor-Liquid Equilibria for Methanol + Ethanol + Water, Methanol + Water, and Ethanol + Water, Journal of Chemical & Engineering Data. 40 (1995) 679-684. doi:10.1021/je00019a033

T / K = 323.15
 P / bar x_1 y_1
 0.2912 0.2470 0.6710
 0.3062 0.2842 0.7029
 0.3114 0.2940 0.7109
 0.3279 0.3338 0.7373
 0.3532 0.4028 0.7772
 0.3628 0.4316 0.7873
 0.3809 0.4872 0.8100
 0.3934 0.5314 0.8254
 0.4016 0.5513 0.8326
 0.4061 0.5688 0.8410
 0.4205 0.6145 0.8569
 0.4492 0.6989 0.8890
 0.4594 0.7290 0.8991
 0.4733 0.7730 0.9160

Dulitskaya, K.A., Vapor pressure of binary systems. I, Zh. Obshch. Khim. 15 (1945) 9-21.

T / K = 323.15
 P / bar x_1 y_1
 0.1907 0.0873 0.3783
 0.2620 0.1900 0.5883
 0.3260 0.3417 0.7076
 0.3813 0.4943 0.7807
 0.4440 0.6919 0.8655
 0.4973 0.8492 0.9349

Jinyan Fu - Kun Wang - Ying Hu, Studies on the Vapor-Liquid Equilibrium and Vapor-Liquid-Liquid Equilibrium for a Methanol-Methyl Methacrylate-Water Ternary System (I) Three Different Binary Systems, Huagong Xuebao. 39 (1988) 64-76.

T / K = 328.15
 P / bar x_1 y_1
 0.2652 0.1029 0.4635
 0.3398 0.2021 0.6131
 0.3977 0.3032 0.6976
 0.4429 0.4028 0.7559
 0.4822 0.5019 0.8029
 0.5240 0.6096 0.8481

0.5640 0.7073 0.8867
 0.6018 0.8016 0.9231
 0.6429 0.9000 0.9610

Kurihara, Kiyofumi - Minoura, Tsuyoshi - Takeda, Kouichi - Kojima, Kazuo, Isothermal Vapor-Liquid Equilibria for Methanol + Ethanol + Water, Methanol + Water, and Ethanol + Water, Journal of Chemical & Engineering Data. 40 (1995) 679-684. doi:10.1021/je00019a033

T / K = 328.15
 P / bar x_1 y_1
 0.3071 0.1587 0.5660
 0.3337 0.1980 0.6154
 0.3904 0.2961 0.7019
 0.4022 0.3171 0.7182
 0.4084 0.3339 0.7280
 0.4214 0.3610 0.7432
 0.4276 0.3733 0.7504
 0.4424 0.4137 0.7693
 0.4518 0.4346 0.7799
 0.4674 0.4753 0.7947
 0.4818 0.5078 0.8079
 0.5050 0.5669 0.8315
 0.5110 0.5897 0.8401
 0.5197 0.6030 0.8495
 0.5223 0.6091 0.8502
 0.5266 0.6217 0.8557
 0.5425 0.6600 0.8709
 0.5496 0.6781 0.8770
 0.5598 0.7032 0.8866
 0.5921 0.7808 0.9183

Jinyan Fu - Kun Wang - Ying Hu, Studies on the Vapor-Liquid Equilibrium and Vapor-Liquid-Liquid Equilibrium for a Methanol-Methyl Methacrylate-Water Ternary System (I) Three Different Binary Systems, Huagong Xuebao. 39 (1988) 64-76.

T / K = 333.15
 P / bar x_1 y_1
 0.3337 0.1029 0.4579
 0.4256 0.2021 0.6069
 0.4956 0.3032 0.6914
 0.5498 0.4028 0.7501
 0.5977 0.5019 0.7976
 0.6495 0.6096 0.8436
 0.6959 0.7073 0.8831
 0.7434 0.8016 0.9205
 0.7947 0.9000 0.9596

McGlashan, M. L. - Williamson, A. G., Isothermal liquid-vapor equilibria for system methanol-water, Journal of

Chemical & Engineering Data. 21 (1976) 196-199.
doi:10.1021/je60069a019

T / K = 338.15		
P / bar	x_1	y_1
0.3903	0.0854	0.3926
0.3920	0.0874	0.4018
0.4496	0.1328	0.4963
0.5030	0.1816	0.5718
0.5728	0.2586	0.6512
0.7264	0.4920	0.7842
0.7784	0.5815	0.8242
0.8462	0.7043	0.8747
0.9071	0.8028	0.9180
0.9696	0.9030	0.9605

Nagatani, M. - Fujino, K., Measurement of isothermal vapor-liquid equilibria for methanol-water system, Fukuoka Daigaku Kogaku Shuho. 64 (2000) 147-152.

T / K = 338.15		
P / bar	x_1	y_1
0.3283	0.0481	0.2804
0.3819	0.0827	0.3848
0.3995	0.0970	0.4323
0.4012	0.1001	0.4352
0.4119	0.1073	0.4499
0.4126	0.1089	0.4589
0.4131	0.1090	0.4492
0.4531	0.1388	0.5118
0.4596	0.1450	0.5254
0.4768	0.1623	0.5515
0.4793	0.1644	0.5545
0.4914	0.1732	0.5676
0.4971	0.1814	0.5767
0.5032	0.1857	0.5799
0.5052	0.1900	0.5857
0.5656	0.2551	0.6512
0.5694	0.2600	0.6537
0.5824	0.2782	0.6672
0.5865	0.2830	0.6709
0.6370	0.3451	0.7098
0.6370	0.3542	0.7166
0.6413	0.3620	0.7122
0.6445	0.3667	0.7244
0.6968	0.4483	0.7640
0.6992	0.4527	0.7644
0.7021	0.4594	0.7694
0.7050	0.4624	0.7709
0.7659	0.5677	0.8173
0.7729	0.5781	0.8216
0.8216	0.6648	0.8592

0.8291	0.6790	0.8656
0.9003	0.7924	0.9100
0.8985	0.7937	0.9145
0.9033	0.7995	0.9171
0.9101	0.8115	0.9220

Bao, Z. - Liu, M. - Yang, J. - Wang, N., Measurement and Correlation of Moderate Pressure Vapor-Liquid Equilibrium Data for Methanol - Water Binary System, Huagong Xuebao. 46 (1995) 230-233.

T / K = 403.15		
P / bar	x_1	y_1
3.920	0.0990	0.3520
4.720	0.1960	0.5060
5.550	0.3460	0.6370
6.310	0.4920	0.7230
6.820	0.6430	0.7970
7.480	0.7930	0.8810
7.900	0.8910	0.9380
8.150	0.9420	0.9670

Schröder, W., Messungen von Siedegleichgewichten bei Überdruck: Messungen von Siedegleichgewichten bei Überdruck, Chemie Ingenieur Technik. 30 (1958) 523-525. doi:10.1002/cite.330300809

T / K = 413.15		
P / bar	x_1	y_1
5.096	0.0960	0.3440
6.799	0.2750	0.5790
7.879	0.4440	0.7020
8.826	0.5950	0.7860
9.933	0.7910	0.8800
10.59	0.9460	0.9620

Pryanikova, R.O. - Efremova, G.D., Liquid-vapor equilibrium and volume behavior of the methanol-water system at high temperatures and pressures, Fiz. Khim. Rastvorov. (1972) 228-233.

T / K = 523.15		
P / bar	x_1	y_1
40.53	0.0100	0.0300
45.60	0.0700	0.2270
50.66	0.1250	0.3500
55.73	0.1800	0.4500
60.80	0.2600	0.5550
65.86	0.3350	0.6550
70.93	0.4500	0.7350

Pryanikova, R.O. - Efremova, G.D., Liquid-vapor equilibrium and volume behavior of the methanol-water system at high temperatures and pressures, Fiz. Khim. Rastvorov. (1972) 228-233.

T / K =	548.15	
P / bar	x ₁	y ₁
60.80	0.0200	0.0750
65.86	0.0550	0.2000
70.93	0.1000	0.2950
75.99	0.1450	0.3800
81.06	0.1950	0.4550
86.13	0.2400	0.5250

Isobaric phase equilibrium data

Yang, Changsheng - Sun, Feizhong - Ma, Shengyong - Yin, Xia - Zeng, Hao, Organic Salt Effect on Vapor-Liquid Equilibrium of the Methanol + Water System at Subatmospheric Pressure, Journal of Chemical & Engineering Data. 57 (2012) 2696-2701. doi:10.1021/je300613v

P / bar =	0.6662	
T / K	x ₁	y ₁
358.06	0.0200	0.1390
355.88	0.0390	0.2350
352.16	0.0750	0.3660
346.11	0.1600	0.5380
342.54	0.2460	0.6380
341.06	0.2890	0.6740
339.77	0.3320	0.7060
338.16	0.3930	0.7440
336.93	0.4490	0.7690
335.03	0.5360	0.8160
333.76	0.6200	0.8490
331.93	0.7070	0.8880
330.31	0.8190	0.9350
328.20	0.9480	0.9830

Lesteva, T.M. - Ogorodnikov, S.K. - Kazakova, S.V., Liquid-vapor equilibrium in the trimethylcarbinol-methanol-water system at a pressure of 760 mm. V, J. Appl. Chem. USSR. 43 (1970) 1582-1586.

P / bar =	1.013	
T / K	x ₁	y ₁
360.55	0.1000	0.3860
354.95	0.2000	0.5570
351.05	0.3000	0.6610
348.35	0.4000	0.7260
346.25	0.5000	0.7750
344.45	0.6000	0.8230
342.95	0.7000	0.8670
341.15	0.8000	0.9130
339.45	0.9000	0.9560

Hirata, M. - Suda, S., Vapor-liquid equilibrium under pressurized conditions; experimental apparatus and methanol-water system, Kagaku Kogaku. 31 (1967) 759-766. doi:10.1252/kakoronbunshu1953.31.759

P / bar =	8.106	
T / K	x ₁	y ₁
438.25	0.0300	0.1430
434.25	0.0580	0.2320
429.35	0.1060	0.3430
425.25	0.1540	0.4340
421.45	0.2300	0.5140
418.05	0.3090	0.5760
415.15	0.3910	0.6310
411.45	0.5180	0.7200
408.95	0.6180	0.7850
406.95	0.7160	0.8460
404.65	0.8400	0.9100
404.55	0.8500	0.9140

Hirata, M. - Suda, S., Vapor-liquid equilibrium under pressurized conditions; experimental apparatus and methanol-water system, Kagaku Kogaku. 31 (1967) 759-766. doi:10.1252/kakoronbunshu1953.31.759

P / bar =	11.35	
T / K	x ₁	y ₁
451.05	0.0380	0.1640
447.85	0.0670	0.2410
443.25	0.1040	0.3380
438.75	0.1710	0.4340
434.85	0.2400	0.5120
431.35	0.3290	0.5830
427.45	0.4430	0.6640
425.25	0.5110	0.7100
421.15	0.6700	0.8040
420.05	0.7170	0.8250
417.65	0.8450	0.9080

Enthalpy of mixing

Bose, E., Remarks on thermochemical statement of Julius Thomsens, Phys. Z. 7 (1906) 503-505.

T / K =	273.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
-243.63	0.0288	
-485.11	0.0588	
-636.97	0.0903	
-783.47	0.1233	
-883.09	0.1579	
-948.16	0.1942	

SA-SA systems (BAC = 9)

4.900	0.0908	3.840	0.0597
5.140	0.1010	4.280	0.0690
5.470	0.1201	4.730	0.0794
5.480	0.1243	5.180	0.0912
5.650	0.1489	5.460	0.1008
5.650	0.1725	5.490	0.1018
5.600	0.1892	6.240	0.1312
5.500	0.2046	6.290	0.1449
5.340	0.2255	6.770	0.1852
5.060	0.2503	6.750	0.2014
4.930	0.2716	6.740	0.2017
4.720	0.2909	6.750	0.2334
4.470	0.3194	6.540	0.2744
4.410	0.3239	6.290	0.2989
4.230	0.3411	6.230	0.3053
4.010	0.3719	5.980	0.3362
3.610	0.4069	5.540	0.3824
3.500	0.4310	5.490	0.3949
3.260	0.4629	5.430	0.4001
3.030	0.4862	4.920	0.4565
2.810	0.5235	4.500	0.5054
2.540	0.5455	4.500	0.5069
2.410	0.5731	4.100	0.5533
2.370	0.5847	3.710	0.5981
2.020	0.6304	3.600	0.6049
1.870	0.6474	3.260	0.6483
1.770	0.6698	2.800	0.6967
1.530	0.7007	2.700	0.6967
1.430	0.7253	2.310	0.7475
1.120	0.7658	1.820	0.7972
0.9000	0.8001	1.680	0.7986
0.6600	0.8375	1.400	0.8467
0.5400	0.8531	0.6600	0.9011
0.3900	0.8843	0.7200	0.9077
0.1500	0.9366	0.4700	0.9375
		0.2400	0.9582

Benson, George C. - D'Arcy, Patrick J. - Kiyohara, Osamu, Thermodynamics of aqueous mixtures of nonelectrolytes II. Isobaric heat capacities of water-n-alcohol mixtures at 25°C, Journal of Solution Chemistry. 9 (1980) 931-938. doi:10.1007/BF00646404

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
0.7050	0.0094
1.486	0.0204
2.060	0.0290
2.750	0.0400
3.210	0.0491
3.380	0.0510

Ogawa, Hideo - Murakami, Sachio, Excess isobaric heat capacities for water + alkanol mixtures at 298.15 K, Thermochimica Acta. 109 (1986) 145-154. doi:10.1016/0040-6031(86)85016-X

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
1.775	0.0250
3.305	0.0500
4.550	0.0750
5.479	0.1000
6.093	0.1250
6.497	0.1501

SA-SA systems (BAC = 9)

6.808	0.2001	7.190	0.3660
6.690	0.2501	7.250	0.3737
6.388	0.3001	7.180	0.3773
6.016	0.3501	6.800	0.4138
5.624	0.4001	6.830	0.4216
5.204	0.4501	6.510	0.4587
4.823	0.5001	6.360	0.4604
4.365	0.5501	5.940	0.5095
3.937	0.6001	5.820	0.5194
3.496	0.6501	5.440	0.5541
3.026	0.7001	4.890	0.6125
2.049	0.8001	4.360	0.6563
1.114	0.9000	4.040	0.6887

Benson, George C. - D'Arcy, Patrick J., Excess isobaric heat capacities of water-n-alcohol mixtures, Journal of Chemical & Engineering Data. 27 (1982) 439-442. doi:10.1021/je00030a021

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$

x_1

1.100	0.0155
1.530	0.0220
1.830	0.0262
2.230	0.0323
2.290	0.0334
3.020	0.0452
3.190	0.0481
3.420	0.0534
3.470	0.0537
4.570	0.0740
4.880	0.0810
5.680	0.1006
5.860	0.1063
6.470	0.1249
7.040	0.1492
7.170	0.1601
7.300	0.1704
7.460	0.1758
7.660	0.2084
7.730	0.2170
7.780	0.2235
7.810	0.2451
7.810	0.2645
7.790	0.2715
7.530	0.3105
7.540	0.3262
7.390	0.3449
7.340	0.3451
7.370	0.3567

3.920	0.7002
3.830	0.7057
3.790	0.7064
3.100	0.7612
2.510	0.8064
1.960	0.8503
1.930	0.8527
0.7700	0.9471

Critical point

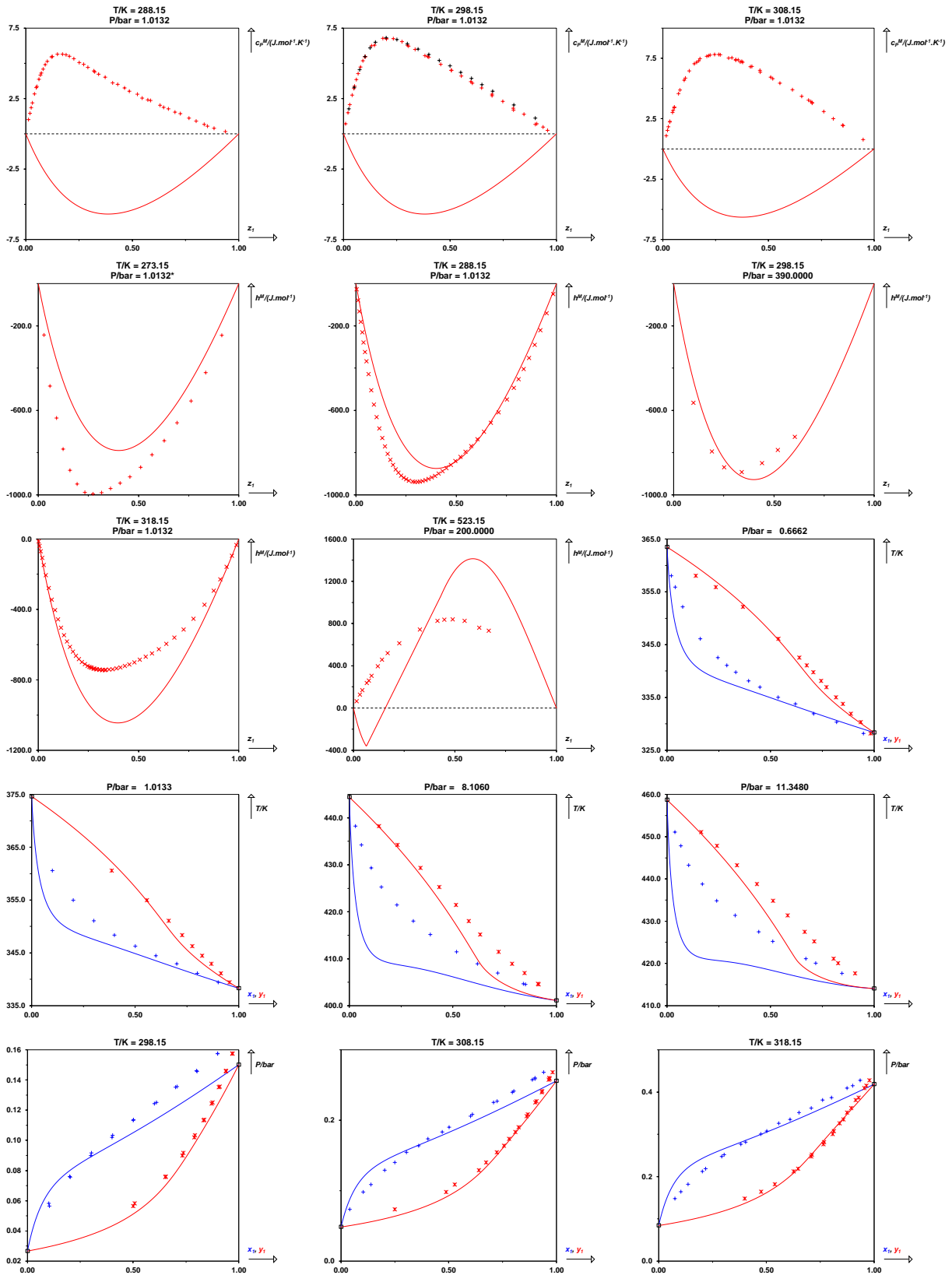
Griswold, J. - Wong, S.Y., Phase-equilibria in the acetone-methanol-water system from 100° into the critical region, Chemical Engineering Progress Symposium Series. 48 (1952) 18-34.

T / K	P / bar	x_1
523.15	85.08	0.7970

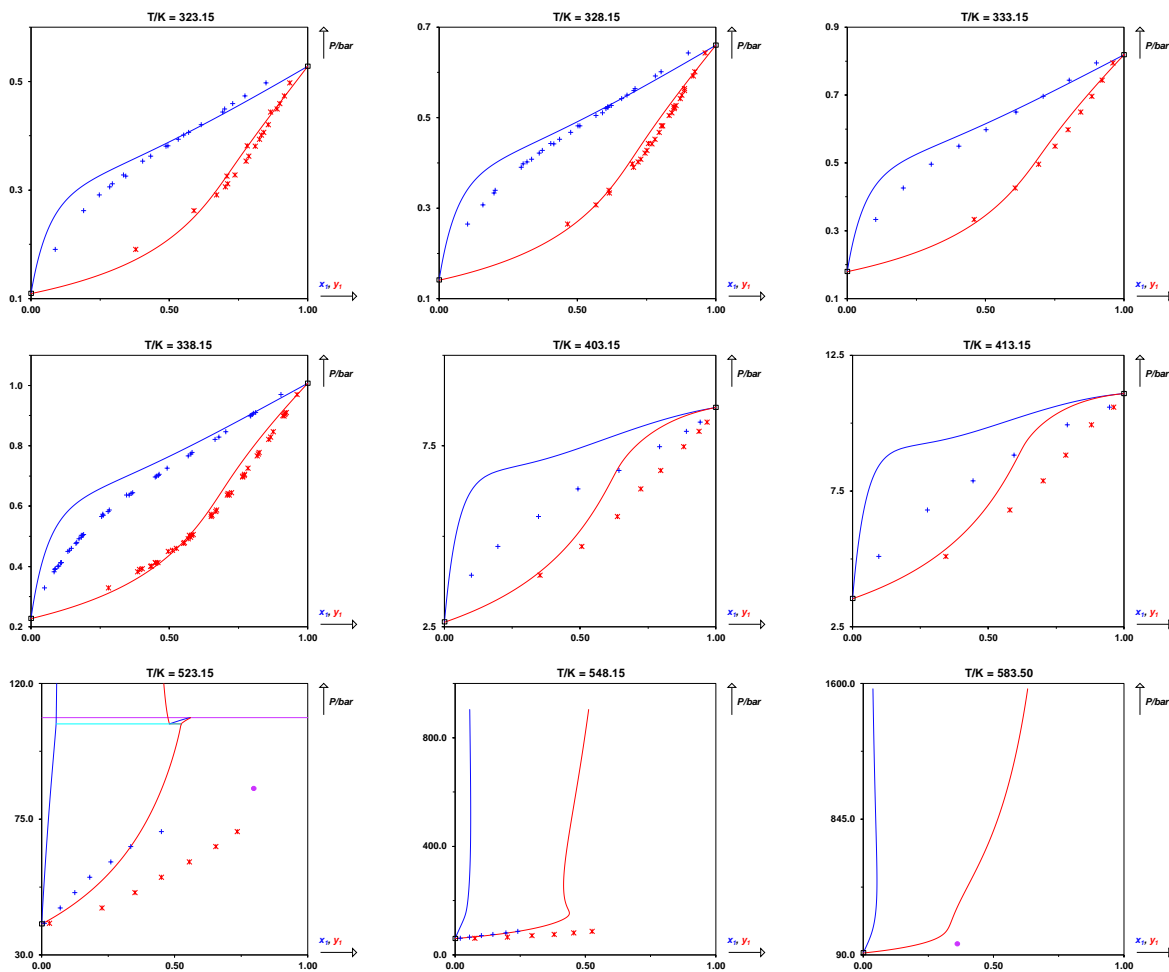
Bazaev, A. R. - Abdulagatov, I. M. - Magee, J. W. - Bazaev, E.A. - Ramazanova, A. E. - Abdurashidova, A. A., PVTx Measurements for a H₂O + Methanol Mixture in the Subcritical and Supercritical Regions, International Journal of Thermophysics. 25 (2004) 805-838. doi:10.1023/B:IJOT.0000034238.64651.32

T / K	P / bar	x_1
583.50	150.00	0.3600

SA-SA systems (BAC = 9)



SA-SA systems (BAC = 9)



METHANOL (1) + ETHANOL (2)

CAS	67-56-1	64-17-5
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	LFQSCWFLJHTTHZ-UHFFFAOYSA-N
T_c / K	512.50	514.00
P_c / bar	80.84	61.37
ω	0.566	0.644

Ideal

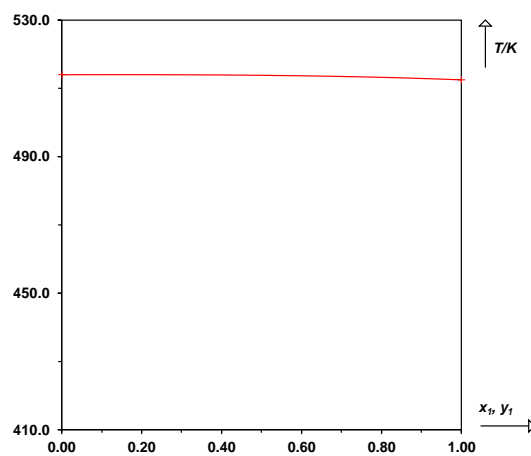
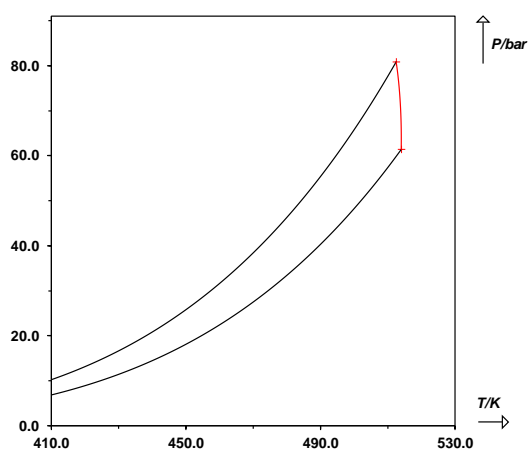
Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = -1.038

B/MPa = 0.859

Deviations

MAPE on x = 17 %MAPE on y = 14 %MAPE on h^M = 18 %MAPE on c_p^M = 200 %

Isothermal phase equilibrium data

Kooner, Zs - Fenby, Dv, Vapour pressure study of the deuterium exchange reaction in methanol-ethanol systems: equilibrium constant determination, Australian Journal of Chemistry. 33 (1980) doi:10.1071/CH9801943

T / K =	298.15	
P / bar	x ₁	y ₁
0.0823	0.0431	0.0860
0.0884	0.1129	0.2112
0.1013	0.2564	0.4230
0.1063	0.3110	0.4903
0.1132	0.3879	0.5752
0.1156	0.4135	0.6011
0.1220	0.4843	0.6678
0.1286	0.5563	0.7288
0.1294	0.5654	0.7360
0.1345	0.6206	0.7782
0.1366	0.6437	0.7949
0.1444	0.7296	0.8528
0.1537	0.8303	0.9131
0.1660	0.9656	0.9836

Hall, D.J. - Mash, C.J. - Pemberton, R.C., Vapor liquid equilibria for the systems water-methanol, water-ethanol, methanol-ethanol, and water-methanol-ethanol at 298.15 K determined by a rapid transpiration method (1979) 1-13.

T / K =	298.15	
P / bar	x ₁	y ₁
0.0856	0.0841	0.1610
0.0905	0.1353	0.2470
0.0956	0.1902	0.3310
0.1042	0.2919	0.4670
0.1104	0.3585	0.5430
0.1176	0.4414	0.6280
0.1264	0.5372	0.7150
0.1356	0.6392	0.7920
0.1458	0.7489	0.8650
0.1548	0.8535	0.9280
0.1612	0.9165	0.9610

Oh, Seung-Kyo - Campbell, Scott W., Total Pressure Measurements for Copper(II) Chloride + Methanol + Ethanol at 303.15 K, Journal of Chemical & Engineering Data. 40 (1995) 504-508. doi:10.1021/je00018a033

T / K =	373.15	
P / bar	x ₁	y ₁
2.465	0.1610	0.2250
2.782	0.4280	0.5290

3.016	0.5910	0.6910
3.318	0.8280	0.8780
3.469	0.9480	0.9670

Butcher, K. L. - Robinson, W. I., An apparatus for determining high-pressure liquid-vapour equilibrium data. I. The methanol-ethanol system, Journal of Applied Chemistry. 16 (2007) 289-292. doi:10.1002/jctb.5010161003

T / K =	373.15	
P / bar	x ₁	y ₁
2.330	0.0620	0.0890
2.448	0.1500	0.2130
2.510	0.2130	0.2880
2.592	0.2820	0.3700
2.717	0.3860	0.4860
2.875	0.4920	0.5970
2.999	0.5880	0.6860
3.103	0.6780	0.7640
3.330	0.8380	0.8890
3.447	0.9410	0.9610

Butcher, K. L. - Robinson, W. I., An apparatus for determining high-pressure liquid-vapour equilibrium data. I. The methanol-ethanol system, Journal of Applied Chemistry. 16 (2007) 289-292. doi:10.1002/jctb.5010161003

T / K =	393.15	
P / bar	x ₁	y ₁
4.385	0.0610	0.0820
4.557	0.1500	0.2000
4.661	0.2120	0.2770
4.806	0.2820	0.3600
4.999	0.3860	0.4730
5.226	0.4910	0.5820
5.440	0.5890	0.6750
5.619	0.6780	0.7530
5.971	0.8380	0.8820
6.205	0.9420	0.9590

Butcher, K. L. - Robinson, W. I., An apparatus for determining high-pressure liquid-vapour equilibrium data. I. The methanol-ethanol system, Journal of Applied Chemistry. 16 (2007) 289-292. doi:10.1002/jctb.5010161003

T / K =	433.15	
P / bar	x ₁	y ₁
12.76	0.0600	0.0750
13.14	0.1490	0.1850
13.38	0.2080	0.2530
13.69	0.2810	0.3390
14.17	0.3750	0.4410

14.72	0.4870	0.5560	3.200	0.3167
15.24	0.5880	0.6520	3.900	0.3974
15.69	0.6730	0.7280	4.400	0.4712
16.51	0.8360	0.8670	4.600	0.5394
17.06	0.9400	0.9510	4.700	0.6002

Isobaric phase equilibrium data

Arce, Alberto - Martínez-Ageitos, José - Rodil, Eva - Soto, Ana, Measurement and prediction of isobaric vapour-liquid equilibrium data of the system ethanol+methanol+2-methoxy-2-methylpropane, Fluid Phase Equilibria. 146 (1998) 139-153. doi:10.1016/S0378-3812(98)00227-1

P / bar = 1.013

T / K	x ₁	y ₁
350.71	0.0418	0.0673
349.88	0.0923	0.1446
348.98	0.1564	0.2326
348.21	0.2026	0.2911
347.57	0.2510	0.3544
346.78	0.2981	0.4089
346.09	0.3440	0.4617
345.40	0.3920	0.5160
344.65	0.4453	0.5716
343.96	0.4938	0.6193
343.21	0.5501	0.6767
342.43	0.6075	0.7288
341.86	0.6512	0.7683
341.19	0.7072	0.8089
340.66	0.7420	0.8358
340.05	0.7964	0.8735
339.27	0.8619	0.9162
338.78	0.9007	0.9378
338.22	0.9421	0.9650
337.83	0.9793	0.9832

Enthalpy of mixing

Pflug, H. D. - Pope, A. E. - Benson, G. C., Heats of mixing of normal alcohols at 25.deg., Journal of Chemical & Engineering Data. 13 (1968) 408-410. doi:10.1021/je60038a032

T / K = 298.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁	
0.9000	0.0734	
1.700	0.1460	
2.500	0.2348	

4.600	0.6519
4.400	0.6965
3.500	0.7998
2.700	0.8535
1.900	0.9049
1.200	0.9465
0.6000	0.9756

Trampe, D. Mark - Eckert, Charles A., Calorimetric measurement of partial molar excess enthalpies at infinite dilution, Journal of Chemical & Engineering Data. 36 (1991) 112-118. doi:10.1021/je00001a033

T / K = 298.15

P / bar = UNKNOWN (1.0132)

h ^M / J.mol ⁻¹	x ₁
2.699	0.8933
2.427	0.9057
2.158	0.9180
1.892	0.9301
1.565	0.9421
1.257	0.9539
0.9510	0.9656
0.6320	0.9772
0.3020	0.9887

Heat capacity of mixing

Ogawa, Hideo - Murakami, Sachio, Excess volumes, isentropic compressions, and isobaric heat capacities for methanol mixed with other alkanols at 25°C, Journal of Solution Chemistry. 16 (1987) 315-326. doi:10.1007/BF00646123

T / K = 298.15

P / bar = UNKNOWN (1.0132)

c _P ^M / J.mol ⁻¹ .K ⁻¹	x ₁
-0.1400	0.1000
-0.2610	0.2000
-0.3160	0.3000
-0.3460	0.4000
-0.3430	0.5000
-0.3120	0.6000
-0.2530	0.7000
-0.1950	0.7995
-0.1550	0.8500
-0.1130	0.9000

-0.0680 0.9500

Fang, Wen-jun - Yu, Qing-sen - Lin, Rui-sen - Zong, Han-xing, Vapor heat capacities of some polar-polar binary systems, *Thermochimica Acta.* 352-353 (2000) 19-23.
doi:10.1016/S0040-6031(99)00431-1

T / K = 402.20

P / bar = 1.013

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ z_1

2.110 0.2103

2.660 0.3502

2.940 0.4993

2.660 0.6444

1.820 0.7980

Fang, Wen-jun - Yu, Qing-sen - Lin, Rui-sen - Zong, Han-xing, Vapor heat capacities of some polar-polar binary systems, *Thermochimica Acta.* 352-353 (2000) 19-23.
doi:10.1016/S0040-6031(99)00431-1

T / K = 441.30

P / bar = 1.013

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ z_1

1.800 0.2103

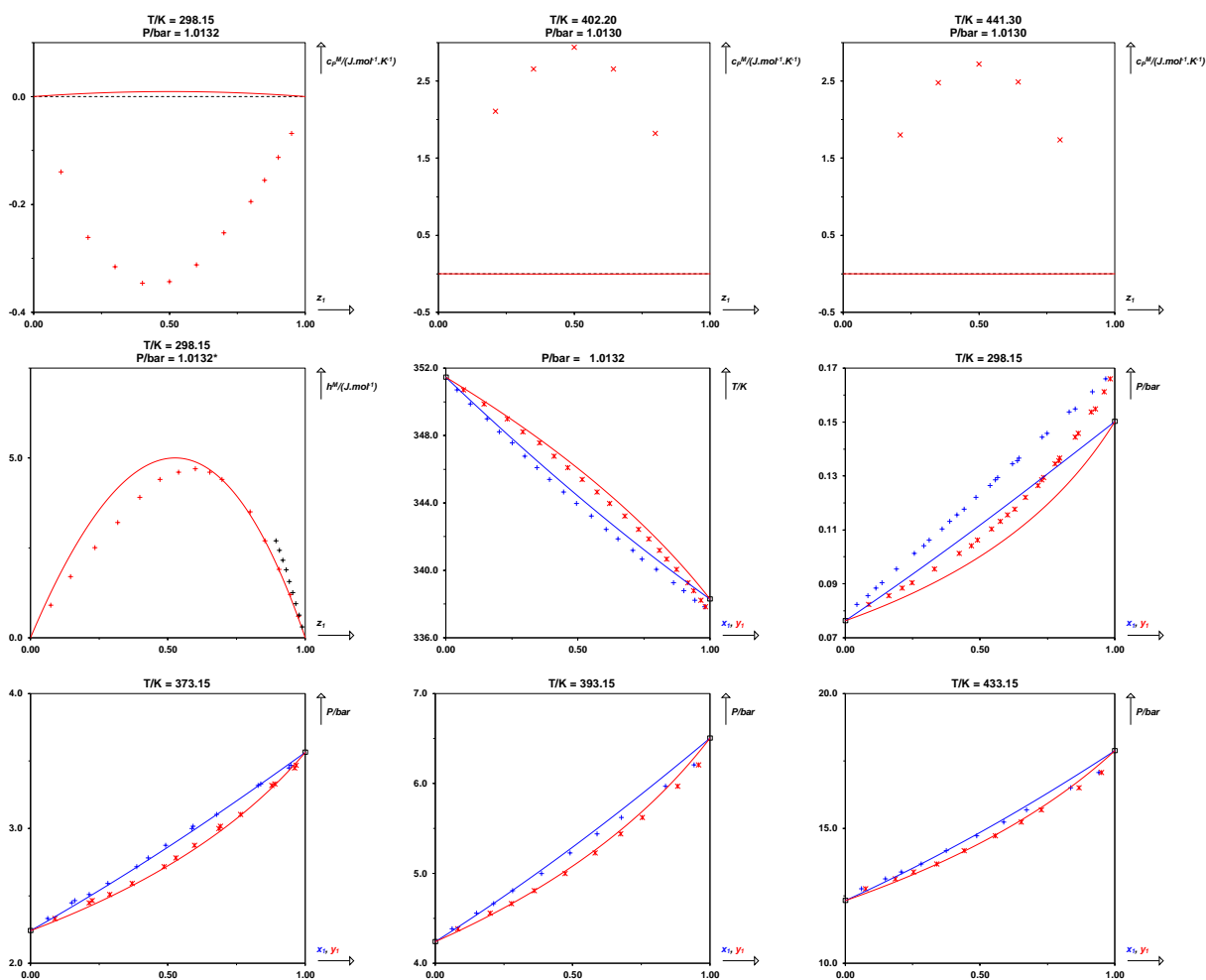
2.480 0.3502

2.720 0.4993

2.490 0.6444

1.740 0.7980

SA-SA systems (BAC = 9)



METHANOL (1) + 1-PROPANOL (2)

CAS	67-56-1	71-23-8
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	BDERNNFJNOPAEC-UHFFFAOYSA-N
T_c / K	512.50	536.80
P_c / bar	80.84	51.69
ω	0.566	0.621

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

$A/\text{MPa} = 3.665$

$B/\text{MPa} = 11.42$

Deviations

MAPE on $x = 11\%$

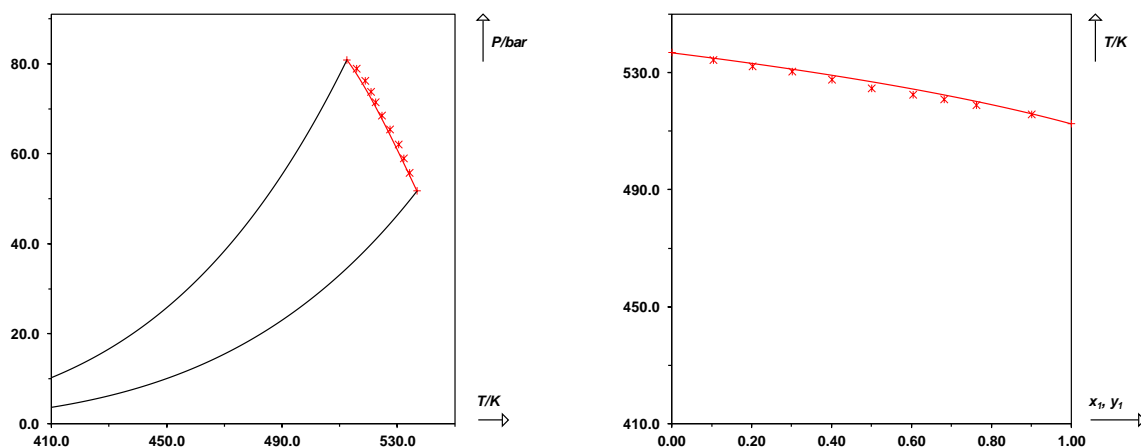
MAPE on $y = 9.1\%$

MAPE on $x_c = 14\%$

MAPE on $P_c = 1.8\%$

MAPE on $h^M = 2.2\%$

MAPE on $c_p^M = 33\%$



Isothermal phase equilibrium data

Yamamoto, Hideki - Fukase, Koji - Shibata, Junji, Vapor-Liquid Equilibria for Alcohol + Alcohol + Sodium Iodide at 298.15 K, Journal of Chemical & Engineering Data. 41 (1996) 1066-1070. doi:10.1021/je9600966

T / K =	298.15	
P / bar	x₁	y₁
0.0341	0.0420	0.1960
0.0510	0.1530	0.5350
0.0725	0.3040	0.7310
0.0787	0.3510	0.7780
0.0916	0.4340	0.8240
0.1065	0.5410	0.8860
0.1162	0.6050	0.9080
0.1321	0.7230	0.9470
0.1542	0.8780	0.9800

Berro, C. - Deyrieux, R. - Peneloux, A., An Ebulliometer for Rapid and Precise Determination of the Vapor-Liquid Equilibrium of Solutions. The Binary System Methanol - 1-Propanol at 60.02 °C, J. Chim. Phys. Phys. Chim. Biol. 72 (1975) 1118-1123.

T / K =	333.17	
P / bar	x₁	y₁
0.2266	0.0368	0.1391
0.2373	0.0528	0.1916
0.2429	0.0611	0.2172
0.2462	0.0649	0.2308
0.2553	0.0764	0.2620
0.2691	0.1007	0.3223
0.2950	0.1393	0.4077
0.3239	0.1842	0.4857
0.3442	0.2151	0.5337
0.3752	0.2625	0.5977
0.4127	0.3206	0.6609
0.4526	0.3806	0.7180
0.4939	0.4459	0.7664
0.5325	0.5022	0.8063
0.5639	0.5520	0.8342
0.5915	0.5970	0.8562
0.6156	0.6338	0.8744
0.6596	0.7034	0.9037
0.6799	0.7370	0.9154
0.7084	0.7830	0.9332
0.7370	0.8275	0.9485
0.7698	0.8804	0.9661
0.7973	0.9238	0.9785
0.8268	0.9707	0.9923

Isobaric phase equilibrium data

Gultekin, Nurbay, Vapor-liquid equilibria at 1 atm for ternary and quaternary systems composed of acetone, methanol, 2-propanol, and 1-propanol, Journal of Chemical & Engineering Data. 35 (1990) 132-136. doi:10.1021/je00060a010

P / bar =	1.013	
T / K	x₁	y₁
365.45	0.0920	0.2350
362.03	0.1800	0.4120
357.05	0.2800	0.5620
355.68	0.3200	0.6100
353.40	0.3800	0.6750
351.30	0.4590	0.7530
347.61	0.5810	0.8320
347.42	0.5830	0.8350
344.43	0.6800	0.8880
342.55	0.7640	0.9280
341.45	0.8220	0.9400
340.23	0.8620	0.9550

Kojima, K. - Tochigi, K. - Seki, H. - Watase, K., Determination of vapor-liquid equilibria from boiling point curves, Kagaku Kogaku. 32 (1968) 149-153. doi:10.1252/kakoronbunshu1953.32.149

P / bar =	1.013	
T / K	x₁	y₁
367.41	0.0500	0.1487
364.61	0.1000	0.2785
362.16	0.1500	0.3809
359.93	0.2000	0.4664
357.82	0.2500	0.5408
355.87	0.3000	0.6043
354.01	0.3500	0.6602
352.34	0.4000	0.7069
350.71	0.4500	0.7494
349.16	0.5000	0.7871
347.73	0.5500	0.8196
346.39	0.6000	0.8483
345.08	0.6500	0.8747
343.88	0.7000	0.8975
342.78	0.7500	0.9176
341.70	0.8000	0.9366
340.64	0.8500	0.9545
339.57	0.9000	0.9715
338.60	0.9500	0.9861

Enthalpy of mixing

Pflug, H. D. - Pope, A. E. - Benson, G. C., Heats of mixing of normal alcohols at 25.deg., Journal of Chemical & Engineering Data. 13 (1968) 408-410. doi:10.1021/je60038a032

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
7.500	0.0319
21.40	0.0916
39.80	0.1794
56.20	0.2693
69.80	0.3577
78.30	0.4427
83.10	0.5226
83.80	0.5816
84.10	0.5894
82.70	0.6347
82.20	0.6488
78.90	0.6916
78.50	0.6981
73.60	0.7403
72.50	0.7475
63.00	0.8030
51.80	0.8525
39.20	0.8970
27.40	0.9319
15.00	0.9646
5.500	0.9875

Trampe, D. Mark - Eckert, Charles A., Calorimetric measurement of partial molar excess enthalpies at infinite dilution, Journal of Chemical & Engineering Data. 36 (1991) 112-118. doi:10.1021/je00001a033

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
5.820	0.9869
5.530	0.9874
5.070	0.9886
4.520	0.9897
4.090	0.9909
3.540	0.9920
3.050	0.9932
2.540	0.9943
2.010	0.9955
1.510	0.9966

Khurma, Jagjit R. - Fenby, David V., Thermochemical study of deuterium exchange reactions in water-alcohol and alcohol-alcohol systems, The Journal of Physical Chemistry. 83 (1979) 2443-2447. doi:10.1021/j100482a004

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
45.00	0.1899
69.70	0.3341
81.80	0.4396
87.30	0.5660
84.70	0.6507
71.80	0.7788
50.40	0.8632
29.70	0.9282

Heat capacity of mixing

Ogawa, Hideo - Murakami, Sachio, Excess volumes, isentropic compressions, and isobaric heat capacities for methanol mixed with other alkanols at 25°C, Journal of Solution Chemistry. 16 (1987) 315-326. doi:10.1007/BF00646123

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_P^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
-0.4110	0.0979
-0.7180	0.1963
-0.9080	0.2952
-0.9810	0.3945
-0.9670	0.4942
-0.9790	0.5944
-0.7110	0.6951
-0.6090	0.7456
-0.5020	0.7963
-0.3840	0.8470
-0.2630	0.8979
-0.1350	0.9489

Critical point

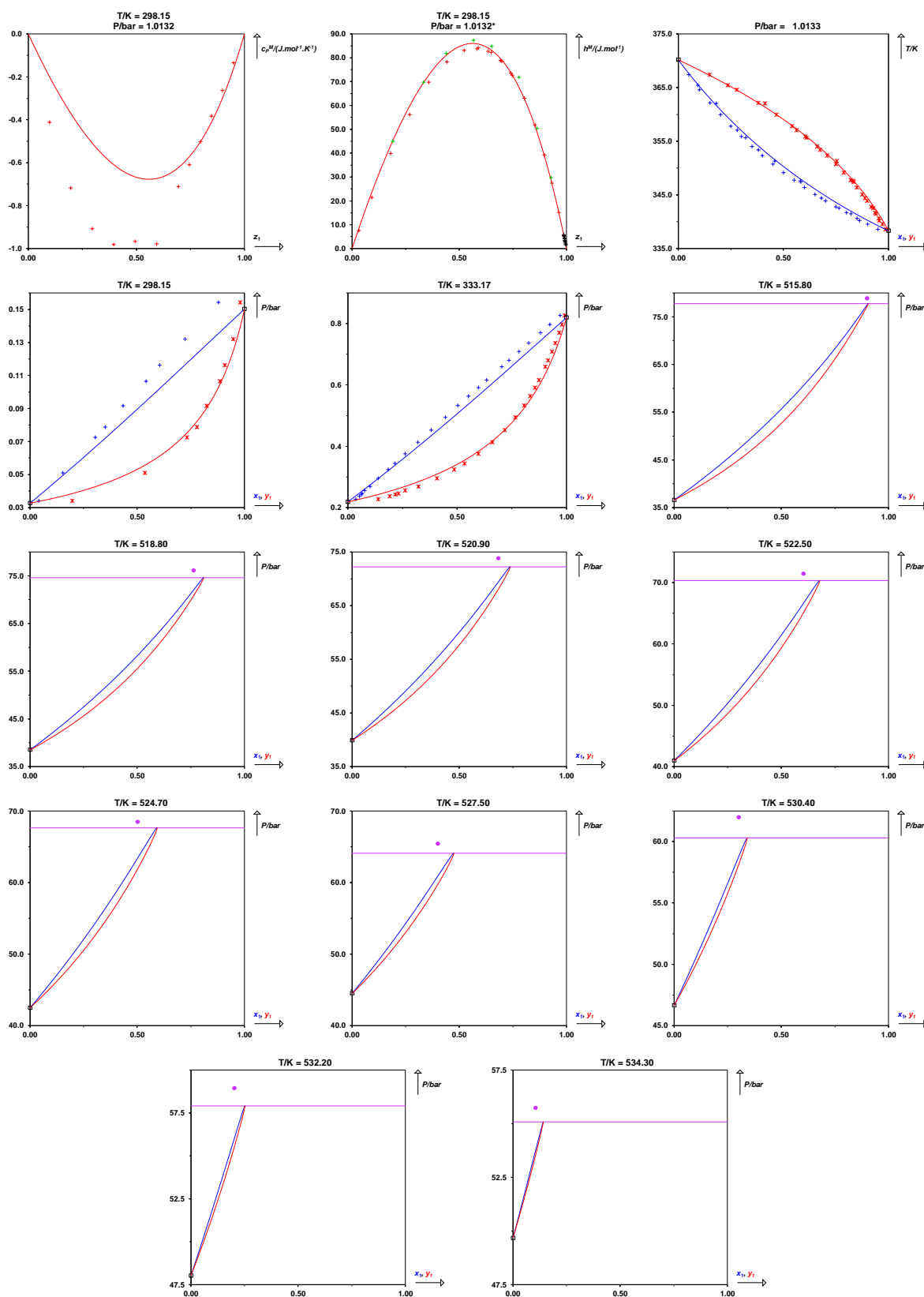
Wang, Lipu - Han, Kewei - Xia, Shuqian - Ma, Peisheng - Yan, Fangyou, Measurement and correlation of critical properties for binary mixtures and ternary mixtures containing gasoline additives, The Journal of Chemical Thermodynamics. 74 (2014) 161-168. doi:10.1016/j.jct.2014.01.025

T / K	P / bar	x_1
515.80	78.85	0.9002

SA-SA systems (BAC = 9)

518.80	76.13	0.7626
520.90	73.79	0.6822
522.50	71.41	0.6039
524.70	68.45	0.5009
527.50	65.42	0.4005
530.40	61.98	0.3015
532.20	58.93	0.2016
534.30	55.73	0.1045

SA-SA systems (BAC = 9)



METHANOL (1) + 1-BUTANOL (2)

CAS	67-56-1	71-36-3
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	LRHPLDYGYMQRHN-UHFFFAOYSA-N
T_c / K	512.50	563.10
P_c / bar	80.84	44.14
ω	0.566	0.588

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 5.301$$

$$B/\text{MPa} = 17.37$$

Deviations

$$\text{MAPE on } x = 17 \%$$

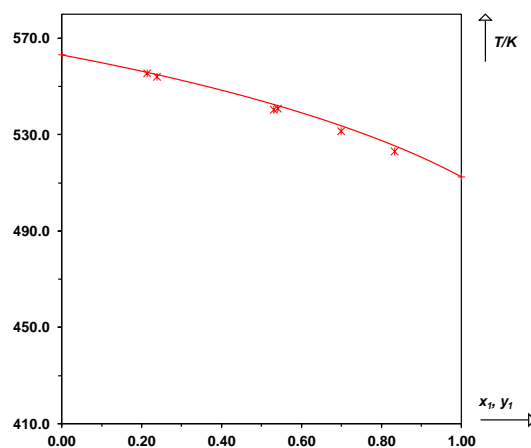
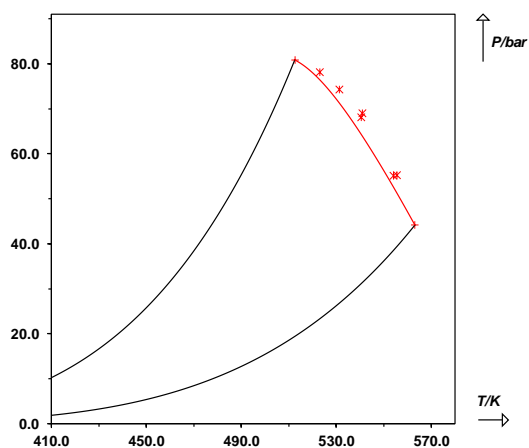
$$\text{MAPE on } y = 13 \%$$

$$\text{MAPE on } x_c = 7.5 \%$$

$$\text{MAPE on } P_c = 5.1 \%$$

$$\text{MAPE on } h^M = 17 \%$$

$$\text{MAPE on } c_p^M = 32 \%$$



-----			347.06	0.6422	0.9397	
Isothermal phase equilibrium data			345.09	0.7086	0.9553	
-----			342.96	0.7819	0.9705	
Polák, Jiří - Murakami, Sachio - Lam, V. T. - Pflug, H. D. - Benson, G. C., Molar excess enthalpies, volumes, and Gibbs free energies of methanol – isomeric butanol systems at 25 °C, Canadian Journal of Chemistry. 48 (1970) 2457-2465. doi:10.1139/v70-417			341.42	0.8418	0.9795	
T / K = 298.15			340.23	0.8907	0.9854	
P / bar	x ₁	y ₁	339.23	0.9333	0.9913	
0.0245	0.0871	0.6569	338.26	0.9736	0.9971	
0.0261	0.0953	0.6800	Kay, W.B. - Donham, W.E., Liquid-vapour equilibria in the iso-butanol–n-butanol, methanol–n-butanol and diethyl ether–n-butanol systems, Chemical Engineering Science. 4 (1955) 1-16. doi:10.1016/0009-2509(55)85001-4			
0.0299	0.1200	0.7302	P / bar = 55.16			
0.0320	0.1295	0.7482	T / K	x ₁	y ₁	
0.0384	0.1690	0.8010	555.45	0.2140	0.2140	CRIT
0.0495	0.2340	0.8564	553.15	0.2290	0.2510	
0.0549	0.2654	0.8751	543.15	0.3140	0.4010	
0.0619	0.3072	0.8946	533.15	0.4090	0.5370	
0.0637	0.3173	0.8993	523.15	0.5130	0.6530	
0.0700	0.3557	0.9128	513.15	0.6370	0.7630	
0.0714	0.3628	0.9150	503.15	0.7800	0.8700	
0.0802	0.4172	0.9310	493.15	0.9490	0.9730	
0.0817	0.4258	0.9329	Kay, W.B. - Donham, W.E., Liquid-vapour equilibria in the iso-butanol–n-butanol, methanol–n-butanol and diethyl ether–n-butanol systems, Chemical Engineering Science. 4 (1955) 1-16. doi:10.1016/0009-2509(55)85001-4			
0.0868	0.4569	0.9396	P / bar = 68.95			
0.0943	0.5048	0.9487	T / K	x ₁	y ₁	
0.1068	0.5845	0.9612	540.85	0.5400	0.5400	CRIT
0.1175	0.6544	0.9702	533.15	0.5980	0.6570	
0.1277	0.7237	0.9772	523.15	0.7100	0.7790	
0.1416	0.8164	0.9855	513.15	0.8430	0.8910	
0.1489	0.8660	0.9894	-----			
0.1584	0.9290	0.9943	Enthalpy of mixing			
-----			-----			
Isobaric phase equilibrium data			Stokes, R.H, Excess enthalpies of (butan-1-ol + methanol) at 278.15, 298.15, and 318.15 K, The Journal of Chemical Thermodynamics. 20 (1988) 1349-1352. doi:10.1016/0021-9614(88)90172-3			
-----			T / K = 278.15			
Arce, Alberto - Martínez-Ageitos, José - Rodil, Eva - Soto, Ana, Phase equilibria involved in extractive distillation of 2-methoxy-2-methylpropane+methanol using 1-butanol as entrainer, Fluid Phase Equilibria. 171 (2000) 207-218. doi:10.1016/S0378-3812(00)00364-2			P / bar = UNKNOWN (1.0132)			
P / bar = 1.013			h ^M / J.mol ⁻¹	x ₁		
T / K	x ₁	y ₁	7.400	0.0154		
386.44	0.0271	0.1480	22.70	0.0480		
384.73	0.0419	0.2139	46.10	0.0997		
367.00	0.2298	0.6604	72.60	0.1625		
363.33	0.2785	0.7297	94.00	0.2180		
361.05	0.3227	0.7771	111.60	0.2681		
357.91	0.3729	0.8199	-----			
355.76	0.4282	0.8526				
353.06	0.4912	0.8873				
349.94	0.5650	0.9173				

SA-SA systems (BAC = 9)

125.70	0.3133	Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6	
137.20	0.3543		
146.40	0.3921		
156.70	0.4433		
165.30	0.5027	T / K = 298.15	
169.40	0.5540	P / bar = 1.010	
170.30	0.5976	$h^M / J.mol^{-1}$	z_1
168.70	0.6314	3.690	0.0441
168.90	0.6354	18.42	0.0860
166.40	0.6593	31.77	0.1260
165.70	0.6691	43.85	0.1641
162.80	0.6876	56.74	0.2006
161.30	0.6988	95.76	0.3608
157.60	0.7165	127.83	0.4918
150.80	0.7457	138.29	0.6009
142.30	0.7749	146.86	0.6931
131.60	0.8049	122.61	0.7721
118.60	0.8350	99.61	0.8405
103.30	0.8652	69.69	0.9003
85.10	0.8957	34.51	0.9531
69.80	0.9184		
58.80	0.9334	Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, The Journal of Chemical Thermodynamics. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6	
46.70	0.9486		
34.00	0.9638		
20.40	0.9789		
6.700	0.9933	T / K = 303.15	
		P / bar = 1.010	
		$h^M / J.mol^{-1}$	z_1
		3.390	0.0441
		15.21	0.0860
		27.05	0.1260
		38.83	0.1641
		48.65	0.2006
		90.82	0.3608
		117.23	0.4918
		130.22	0.6009
		129.69	0.6931
		117.17	0.7721
		95.06	0.8405
		66.57	0.9003
		32.68	0.9531
		Stokes, R.H, Excess enthalpies of (butan-1-ol + methanol) at 278.15, 298.15, and 318.15 K, The Journal of Chemical Thermodynamics. 20 (1988) 1349-1352. doi:10.1016/0021-9614(88)90172-3	
		T / K = 318.15	
		P / bar = UNKNOWN (1.0132)	
		$h^M / J.mol^{-1}$	x_1
		4.700	0.0206

13.70	0.0586
22.00	0.0930
34.10	0.1425
49.10	0.2027
62.20	0.2556
76.30	0.3148
90.10	0.3774
102.50	0.4410
112.30	0.5032
118.10	0.5557
121.00	0.6010
121.60	0.6401
122.90	0.6457
120.60	0.6741
122.10	0.6756
120.20	0.7055
116.80	0.7359
111.90	0.7665
105.10	0.7972
96.20	0.8286
85.20	0.8593
73.70	0.8859
61.80	0.9096
50.60	0.9294
40.70	0.9453
30.00	0.9611
18.60	0.9768
6.300	0.9924

Battler, John R. - Rowley, Richard L., Excess enthalpies between 293 and 323 K for constituent binaries of ternary mixtures exhibiting partial miscibility, *The Journal of Chemical Thermodynamics*. 17 (1985) 719-732. doi:10.1016/0021-9614(85)90101-6

T / K = 323.15

P / bar = 1.010

$h^M / \text{J.mol}^{-1}$ z_1

2.370	0.0441
8.230	0.0860
15.38	0.1260
22.17	0.1641
29.50	0.2006
61.26	0.3608
88.70	0.4918
104.11	0.6009
108.37	0.6931
99.49	0.7721
82.39	0.8405
58.45	0.9003
28.75	0.9531

Heat capacity of mixing

Ogawa, Hideo - Murakami, Sachio, Excess volumes, isentropic compressions, and isobaric heat capacities for methanol mixed with other alkanols at 25°C, *Journal of Solution Chemistry*. 16 (1987) 315-326. doi:10.1007/BF00646123

T / K = 298.15

P / bar = UNKNOWN (1.0132)

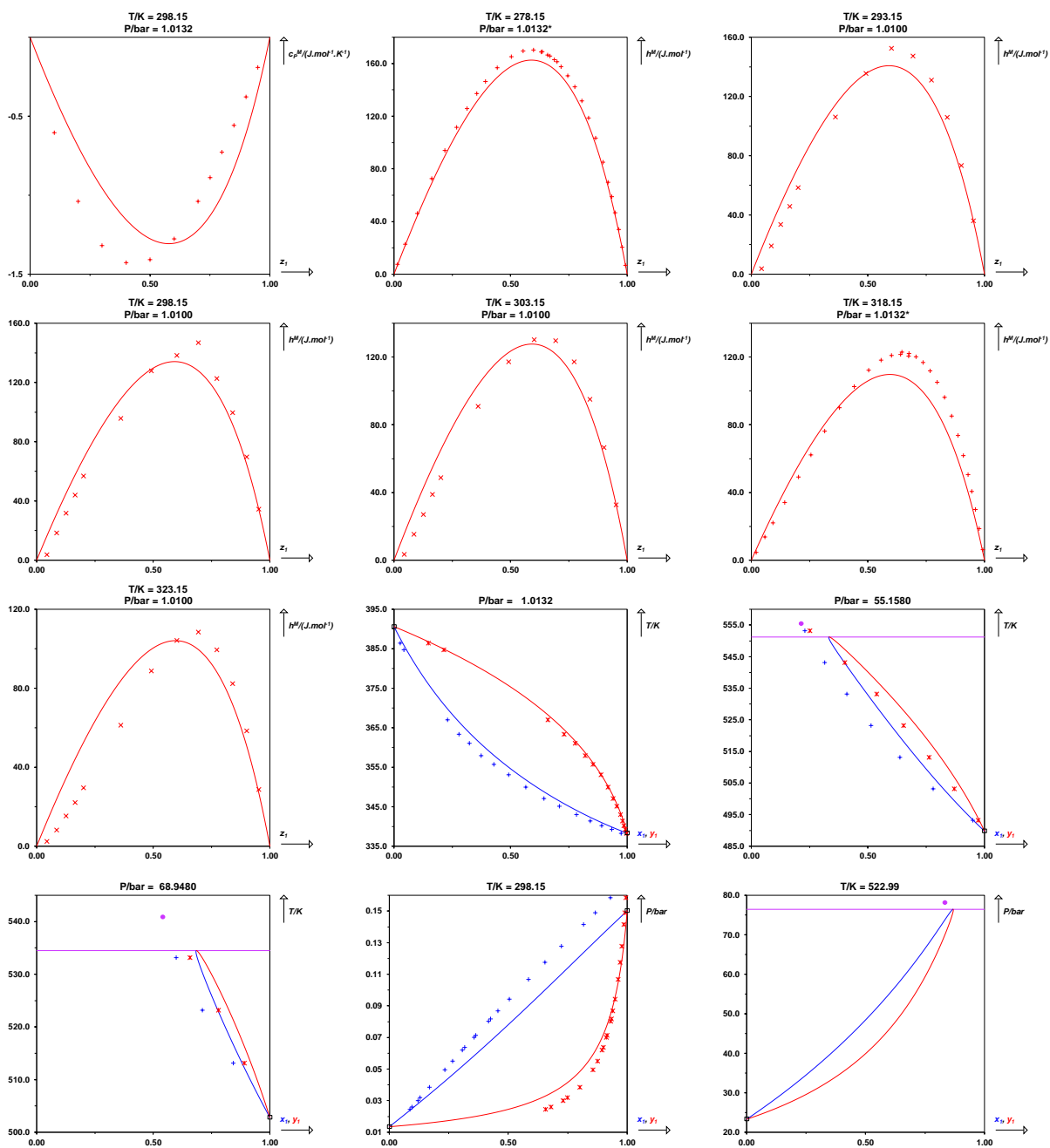
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

-0.6040	0.1000
-1.040	0.2001
-1.319	0.3001
-1.428	0.4001
-1.409	0.5001
-1.276	0.6001
-1.039	0.7001
-0.8890	0.7501
-0.7280	0.8001
-0.5590	0.8500
-0.3770	0.9000
-0.1910	0.9500

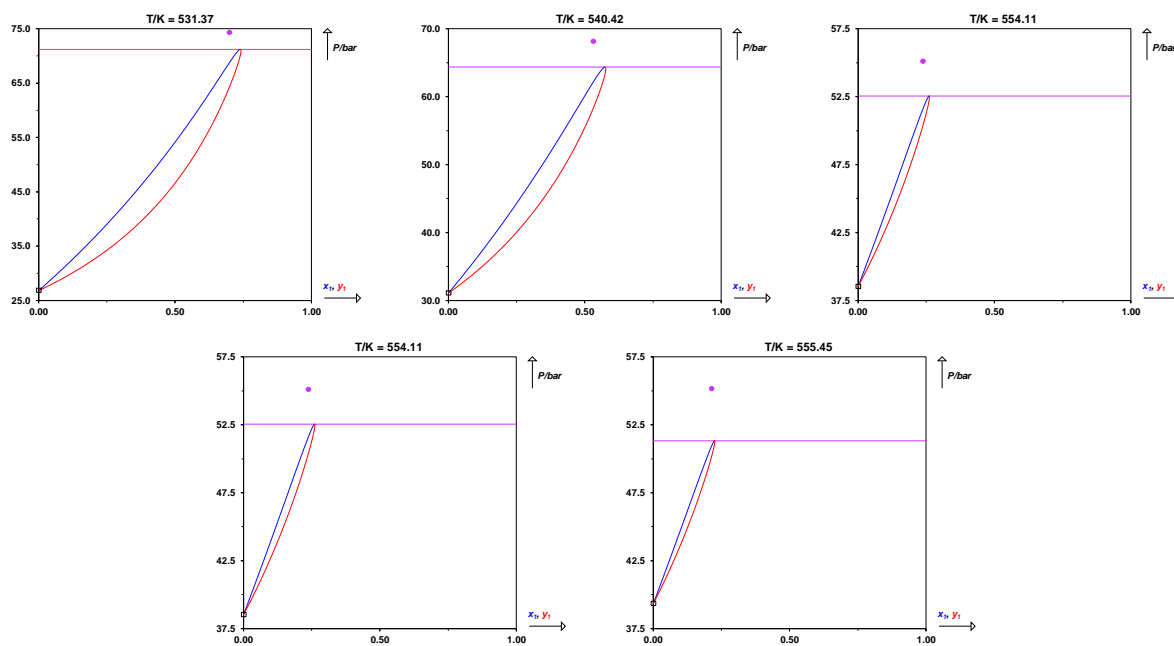
Critical point

Kay, W.B. - Donham, W.E., Liquid-vapour equilibria in the iso-butanol—n-butanol, methanol—n-butanol and diethyl ether—n-butanol systems, *Chemical Engineering Science*. 4 (1955) 1-16. doi:10.1016/0009-2509(55)85001-4

T / K	P / bar	x_1
522.99	78.13	0.8334
531.37	74.29	0.6993
540.42	68.13	0.5307
554.11	55.08	0.2381



SA-SA systems (BAC = 9)



METHANOL (1) + 3-METHYL-1-BUTANOL (2)

CAS	67-56-1	123-51-3
InChiKey	OKKJLVBELUTLKV-UHFFFAOYSA-N	PHTQWCKDNZKARW-UHFFFAOYSA-N
T_c / K	512.50	577.20
P_c / bar	80.84	39.30
ω	0.566	0.590

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

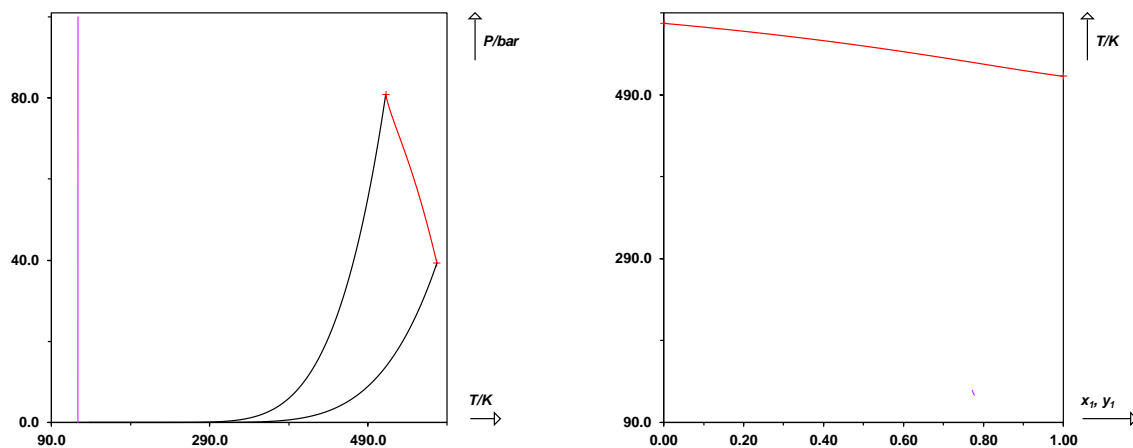
A/MPa = 49.01

B/MPa = 56.77

Deviations

MAPE on x = 6.6 %

MAPE on y = 13 %



Isothermal phase equilibrium data			0.6324	0.8850	0.9930
-----			0.6582	0.9320	0.9960

Kim, J.S. - Lee, J.M., The prediction of vapor-liquid equilibrium data for methanol/3-methyl-1-butanol system at constant temperature, Kongop Hwahak. 16 (2005) 749-754.			Udovenko, V.V. - Frid, Ts.B., Heats of vaporization of binary mixtures. II, Zh. Fiz. Khim. 22 (1948) 1135-1145.		
T / K = 323.15			T / K = 333.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.1020	0.1180	0.7990	0.1420	0.1000	0.7290
0.1332	0.1640	0.8520	0.2360	0.2000	0.8540
0.1472	0.1860	0.8680	0.3245	0.3000	0.9050
0.1697	0.2240	0.8910	0.4068	0.4000	0.9350
0.1868	0.2530	0.9050	0.5585	0.6000	0.9670
0.2100	0.2920	0.9210	0.6290	0.7000	0.9780
0.2396	0.3420	0.9340	0.7011	0.8000	0.9860
0.2540	0.3660	0.9400	0.7653	0.9000	0.9940
0.2810	0.4140	0.9500	Kim, J.S. - Lee, J.M., The prediction of vapor-liquid equilibrium data for methanol/3-methyl-1-butanol system at constant temperature, Kongop Hwahak. 16 (2005) 749-754.		
0.3158	0.4840	0.9610	T / K = 333.15		
0.3322	0.5130	0.9640	P / bar	x ₁	y ₁
0.3704	0.5900	0.9720	0.1668	0.1270	0.7750
0.3985	0.6430	0.9770	0.2101	0.1740	0.8330
0.4054	0.6570	0.9780	0.2269	0.1930	0.8490
0.4341	0.7150	0.9830	0.2469	0.2150	0.8640
0.4569	0.7650	0.9860	0.3020	0.2770	0.8970
0.4901	0.8380	0.9910	0.3513	0.3340	0.9160
0.5278	0.8920	0.9940	0.3641	0.3500	0.9210
Kim, J.S. - Lee, J.M., The prediction of vapor-liquid equilibrium data for methanol/3-methyl-1-butanol system at constant temperature, Kongop Hwahak. 16 (2005) 749-754.			0.3848	0.3750	0.9280
T / K = 328.15			0.4246	0.4240	0.9390
P / bar	x ₁	y ₁	0.4654	0.4740	0.9490
0.1220	0.1060	0.7600	0.4937	0.5120	0.9550
0.1537	0.1480	0.8200	0.5277	0.5580	0.9610
0.2263	0.2450	0.8910	0.5444	0.5830	0.9640
0.2475	0.2740	0.9040	0.5876	0.6420	0.9720
0.2729	0.3080	0.9170	0.6100	0.6740	0.9750
0.3321	0.3910	0.9390	0.6512	0.7310	0.9800
0.3530	0.4230	0.9440	0.6782	0.7680	0.9830
0.3721	0.4520	0.9500	0.7271	0.8180	0.9870
0.4057	0.5040	0.9580	0.7378	0.8580	0.9900
0.4245	0.5340	0.9620	0.7798	0.9250	0.9950
0.4566	0.5810	0.9670	Kim, J.S. - Lee, J.M., The prediction of vapor-liquid equilibrium data for methanol/3-methyl-1-butanol system at constant temperature, Kongop Hwahak. 16 (2005) 749-754.		
0.4750	0.6120	0.9710	T / K = 338.15		
0.4885	0.6340	0.9730	P / bar	x ₁	y ₁
0.5194	0.6870	0.9780	0.1913	0.1070	0.7250
0.5462	0.7320	0.9820	0.2189	0.1320	0.7650
0.5713	0.7750	0.9850			
0.6089	0.8400	0.9900			

SA-SA systems (BAC = 9)

0.2790	0.1860	0.8280	0.7686	0.5410	0.9510
0.3220	0.2240	0.8590	0.8045	0.5750	0.9560
0.3648	0.2610	0.8800	0.8527	0.6220	0.9630
0.4504	0.3420	0.9110	0.9287	0.6950	0.9730
0.4817	0.3740	0.9200	0.9590	0.7250	0.9760
0.5312	0.4250	0.9330	1.016	0.7800	0.9810
0.5564	0.4500	0.9390	1.073	0.8370	0.9860
0.6169	0.5130	0.9510	1.148	0.9140	0.9930
0.6819	0.5860	0.9610			
0.7217	0.6310	0.9670			
0.7529	0.6670	0.9710			
0.7761	0.6930	0.9740			
0.8099	0.7320	0.9780			
0.8274	0.7530	0.9800			
0.8897	0.8300	0.9870			
0.9394	0.8770	0.9910			
0.9715	0.9300	0.9950			

Isobaric phase equilibrium data

Resa, JoséM - González, Cristina - Moradillo, Blanca - Ruiz, Aitor, Isobaric vapor-liquid equilibria of 3-methyl-1-butanol with methanol and vinyl acetate at 101.3 kPa, Fluid Phase Equilibria. 132 (1997) 205-213. doi:10.1016/S0378-3812(97)00027-7

P / bar = 1.013

T / K	x ₁	y ₁
384.50	0.1040	0.5420
379.00	0.1380	0.6460
373.20	0.1840	0.7260
368.30	0.2270	0.8140
364.80	0.2850	0.8510
362.50	0.3200	0.8730
361.40	0.3350	0.8770
359.60	0.3610	0.8920
356.40	0.4090	0.9200
353.50	0.4700	0.9380
352.50	0.4900	0.9440
347.80	0.6060	0.9600
343.80	0.7100	0.9800
341.70	0.8080	0.9870
339.10	0.9170	0.9960

Udovenko, V.V. - Frid, Ts.B., Heats of vaporization of binary mixtures. II, Zh. Fiz. Khim. 22 (1948) 1135-1145.

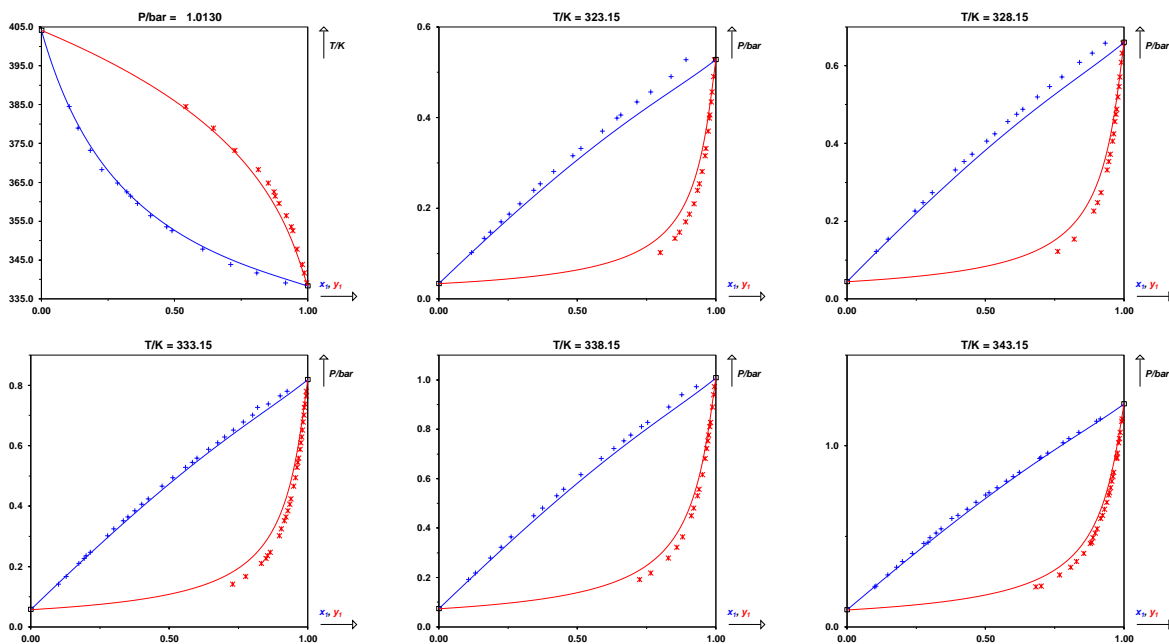
T / K = 343.15

P / bar	x ₁	y ₁
0.2207	0.1000	0.6810
0.3606	0.2000	0.8280
0.4918	0.3000	0.8880
0.6145	0.4000	0.9220
0.7283	0.5000	0.9440
0.8294	0.6000	0.9600
0.9351	0.7000	0.9730
1.039	0.8000	0.9840
1.135	0.9000	0.9920

Kim, J.S. - Lee, J.M., The prediction of vapor-liquid equilibrium data for methanol/3-methyl-1-butanol system at constant temperature, Kongop Hwahak. 16 (2005) 749-754.

T / K = 343.15

P / bar	x ₁	y ₁
0.2260	0.1040	0.7010
0.2870	0.1470	0.7670
0.3296	0.1790	0.8080
0.4050	0.2350	0.8550
0.4616	0.2770	0.8780
0.4678	0.2920	0.8840
0.5182	0.3210	0.8960
0.5404	0.3400	0.9030
0.5993	0.3780	0.9150
0.6501	0.4330	0.9300
0.6883	0.4650	0.9370
0.7415	0.5130	0.9470



ETHANOL (1) + WATER (2)

CAS	64-17-5	7732-18-5
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	XLYOFNOQVPJJNP-UHFFFAOYSA-N
T_c / K	514.00	647.10
P_c / bar	61.37	220.64
ω	0.644	0.345

Non-ideal with enthalpic and entropic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 287.1$$

$$B/\text{MPa} = 49.06$$

Deviations

$$\text{MAPE on } x = 31\%$$

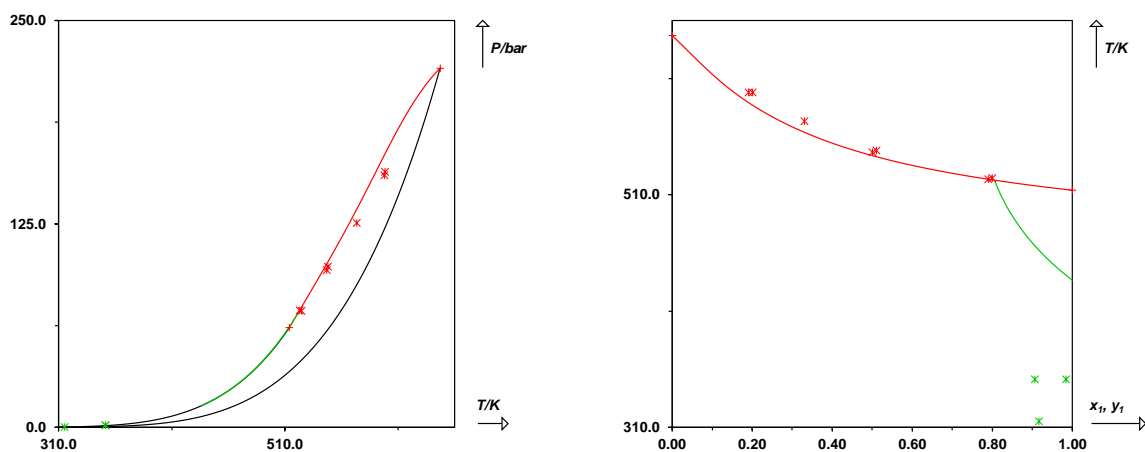
$$\text{MAPE on } y = 19\%$$

$$\text{MAPE on } x_c = 9.5\%$$

$$\text{MAPE on } P_c = 4.6\%$$

$$\text{MAPE on } h^M = 51\%$$

$$\text{MAPE on } c_p^M = 200\%$$



Isothermal phase equilibrium data					
Hall, D.J. - Mash, C.J. - Pemberton, R.C., Vapor liquid equilibria for the systems water-methanol, water-ethanol, methanol-ethanol, and water-methanol-ethanol at 298.15 K determined by a rapid transpiration method (1979) 1-13.			0.0872	0.2469	0.5907
T / K =	298.15		0.0909	0.3239	0.6194
P / bar	x_1	y_1	0.0930	0.3866	0.6406
0.0444	0.0550	0.3230	0.0940	0.4176	0.6508
0.0561	0.1246	0.4970	0.0966	0.5049	0.6797
0.0640	0.2142	0.5790	0.0987	0.5809	0.7087
0.0699	0.3941	0.6480	0.1000	0.6343	0.7329
0.0736	0.5496	0.7005	0.1020	0.7246	0.7810
0.0757	0.7006	0.7685	0.1034	0.8084	0.8337
0.0770	0.7842	0.8185	0.1039	0.8579	0.8705
0.0783	0.8396	0.8585	0.1043	0.8906	0.8979
0.0780	0.8790	0.8895	0.1044	0.8993	0.9056
0.0788	0.9365	0.9390	0.1045	0.9244	0.9284
			0.1046	0.9537	0.9556
			0.1047	0.9731	0.9739
			0.1047	0.9815	0.9819
Dobson, Hilyard John Eglinton, CCCXCVII.—The partial pressures of aqueous ethyl alcohol, J. Chem. Soc., Trans. 127 (1925) 2866-2873. doi:10.1039/CT9252702866			Vu, Dung T. - Lira, Carl T. - Asthana, Navinchandra S. - Kolah, Aspi K. - Miller, Dennis J., Vapor-Liquid Equilibria in the Systems Ethyl Lactate + Ethanol and Ethyl Lactate + Water, Journal of Chemical & Engineering Data. 51 (2006) 1220-1225. doi:10.1021/je050537y		
T / K =	298.15		T / K =	313.15	
P / bar	x_1	y_1	P / bar	x_1	y_1
0.0442	0.0523	0.3164	0.0783	0.0050	0.0360
0.0513	0.0916	0.4334	0.0808	0.0070	0.0690
0.0579	0.1343	0.5037	0.0827	0.0100	0.0960
0.0609	0.1671	0.5449	0.0855	0.0140	0.1330
0.0629	0.2022	0.5683	0.0897	0.0200	0.1810
0.0671	0.2848	0.6105	0.0932	0.0260	0.2210
0.0682	0.3368	0.6286	0.0985	0.0350	0.2690
0.0719	0.4902	0.6790	0.1064	0.0500	0.3320
0.0743	0.5820	0.7095	0.1172	0.0750	0.4070
0.0774	0.7810	0.8161	0.1217	0.0850	0.4210
			0.1301	0.1080	0.4780
			0.1312	0.1110	0.4740
			0.1377	0.1360	0.5190
			0.1425	0.1580	0.5410
			0.1493	0.2010	0.5730
			0.1551	0.2560	0.5980
			0.1579	0.3190	0.6120
			0.1637	0.4180	0.6550
			0.1657	0.4480	0.6600
			0.1696	0.5180	0.6970
			0.1721	0.5830	0.7300
			0.1751	0.6820	0.7670
			0.1771	0.7480	0.8050
			0.1781	0.8280	0.8410
			0.1795	0.8920	0.8930
			0.1800	0.9430	0.9600
Pemberton, R.C - Mash, C.J, Thermodynamic properties of aqueous non-electrolyte mixtures II. Vapour pressures and excess Gibbs energies for water + ethanol at 303.15 to 363.15 K determined by an accurate static method, The Journal of Chemical Thermodynamics. 10 (1978) 867-888. doi:10.1016/0021-9614(78)90160-X					
T / K =	303.15				
P / bar	x_1	y_1			
0.0441	0.0043	0.0412			
0.0480	0.0152	0.1280			
0.0520	0.0273	0.2043			
0.0578	0.0463	0.2975			
0.0639	0.0678	0.3753			
0.0733	0.1099	0.4743			
0.0819	0.1711	0.5479			

Kurihara, Kiyofumi - Minoura, Tsuyoshi - Takeda, Kouichi - Kojima, Kazuo, Isothermal Vapor-Liquid Equilibria for Methanol + Ethanol + Water, Methanol + Water, and Ethanol + Water, Journal of Chemical & Engineering Data. 40 (1995) 679-684. doi:10.1021/je00019a033

T / K = 323.15		
P / bar	x_1	y_1
0.2033	0.0874	0.4341
0.2090	0.0967	0.4549
0.2280	0.1411	0.5120
0.2366	0.1756	0.5372
0.2434	0.2065	0.5562
0.2457	0.2253	0.5636
0.2503	0.2552	0.5761
0.2544	0.2856	0.5890
0.2582	0.3133	0.6008
0.2626	0.3535	0.6133
0.2648	0.3773	0.6226
0.2669	0.3999	0.6311
0.2690	0.4258	0.6397
0.2728	0.4691	0.6563
0.2754	0.4987	0.6660
0.2770	0.5218	0.6741
0.2788	0.5421	0.6840
0.2810	0.5692	0.6971
0.2822	0.5907	0.7050
0.2845	0.6242	0.7205
0.2871	0.6697	0.7434
0.2883	0.6868	0.7523
0.2920	0.7586	0.7940
0.2925	0.7811	0.8081
0.2941	0.8299	0.8429
0.2949	0.8454	0.8555
0.2948	0.8559	0.8639
0.2948	0.8638	0.8699
0.2950	0.8713	0.8769
0.2952	0.8801	0.8849
0.2954	0.8911	0.8948
0.2953	0.9031	0.9065
0.2956	0.9136	0.9151
0.2957	0.9263	0.9273
0.2955	0.9528	0.9512

Pemberton, R.C - Mash, C.J, Thermodynamic properties of aqueous non-electrolyte mixtures II. Vapour pressures and excess Gibbs energies for water + ethanol at 303.15 to 363.15 K determined by an accurate static method, The Journal of Chemical Thermodynamics. 10 (1978) 867-888. doi:10.1016/0021-9614(78)90160-X

T / K = 323.15

P / bar	x_1	y_1
0.1292	0.0043	0.0478
0.1425	0.0152	0.1450
0.1556	0.0272	0.2259
0.1738	0.0463	0.3182
0.1909	0.0678	0.3893
0.2152	0.1098	0.4738
0.2359	0.1710	0.5355
0.2496	0.2468	0.5753
0.2593	0.3238	0.6044
0.2657	0.3884	0.6270
0.2684	0.4175	0.6370
0.2756	0.5049	0.6681
0.2813	0.5808	0.6989
0.2849	0.6343	0.7239
0.2901	0.7245	0.7735
0.2918	0.7638	0.7981
0.2935	0.8084	0.8286
0.2947	0.8579	0.8664
0.2951	0.8906	0.8942
0.2953	0.8993	0.9019

Mertl, I., Liquid-vapour equilibrium. II. Phase equilibria in the ternary system ethyl acetate-ethanol-water, Collection of Czechoslovak Chemical Communications. 37 (1972) 366-374. doi:10.1135/cccc19720366

T / K = 343.15		
P / bar	x_1	y_1
0.4833	0.0620	0.3740
0.5320	0.0950	0.4390
0.5653	0.1310	0.4820
0.6012	0.1940	0.5240
0.6240	0.2520	0.5520
0.6473	0.3340	0.5830
0.6634	0.4010	0.6110
0.7011	0.5930	0.6910
0.7123	0.6800	0.7390
0.7235	0.7930	0.8160
0.7241	0.8100	0.8260
0.7259	0.9430	0.9410
0.7259	0.9470	0.9450

Pemberton, R.C - Mash, C.J, Thermodynamic properties of aqueous non-electrolyte mixtures II. Vapour pressures and excess Gibbs energies for water + ethanol at 303.15 to 363.15 K determined by an accurate static method, The Journal of Chemical Thermodynamics. 10 (1978) 867-888. doi:10.1016/0021-9614(78)90160-X

T / K = 343.15		
P / bar	x_1	y_1
0.3276	0.0043	0.0512

SA-SA systems (BAC = 9)

0.3636	0.0152	0.1532	1.590	0.8907	0.8903	
0.3982	0.0271	0.2348	1.590	0.8993	0.8981	
0.4444	0.0462	0.3245	1.589	0.9244	0.9216	
0.4857	0.0676	0.3906	1.586	0.9537	0.9506	
0.5406	0.1097	0.4662	1.584	0.9731	0.9708	
0.5859	0.1709	0.5216	1.582	0.9815	0.9797	
0.6180	0.2467	0.5604				
0.6411	0.3237	0.5904				
0.6570	0.3883	0.6139				
0.6634	0.4173	0.6244				
0.6814	0.5047	0.6578				
0.6952	0.5807	0.6907				
0.7040	0.6342	0.7170				
0.7159	0.7244	0.7681				
0.7197	0.7637	0.7934				
0.7232	0.8084	0.8247				
0.7255	0.8578	0.8635				
0.7262	0.8906	0.8917				
0.7261	0.8993	0.8995				
0.7259	0.9244	0.9229				
0.7251	0.9537	0.9515				
0.7243	0.9731	0.9713				
0.7239	0.9815	0.9801				
Pemberton, R.C - Mash, C.J, Thermodynamic properties of aqueous non-electrolyte mixtures II. Vapour pressures and excess Gibbs energies for water + ethanol at 303.15 to 363.15 K determined by an accurate static method, The Journal of Chemical Thermodynamics. 10 (1978) 867-888. doi:10.1016/0021-9614(78)90160-X			Niesen, V. - Palavra, A. - Kidnay, A. J. - Yesavage, V. F., An apparatus for vapor—liquid equilibrium at elevated temperatures and pressures and selected results for the water—ethanol and methanol—ethanol systems, Fluid Phase Equilibria. 31 (1986) 283-298. doi:10.1016/0378-3812(86)87013-3			
T / K =	363.15		T / K =	523.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁	
0.7373	0.0043	0.0520	53.02	0.1010	0.2600	
0.8191	0.0151	0.1539	58.06	0.2050	0.3620	
0.8962	0.0269	0.2337	64.47	0.3700	0.4750	
0.9967	0.0459	0.3200	69.64	0.5900	0.6200	
1.083	0.0673	0.3823	71.02	0.6790	0.6930	
1.196	0.1094	0.4530	71.23	0.6850	0.6970	
1.288	0.1706	0.5058				
1.356	0.2464	0.5449				
1.407	0.3236	0.5763				
1.442	0.3880	0.6010				
1.456	0.4170	0.6123				
1.496	0.5044	0.6480				
1.526	0.5804	0.6830				
1.545	0.6340	0.7106				
1.570	0.7243	0.7639				
1.578	0.7636	0.7901				
1.585	0.8083	0.8224				
1.589	0.8578	0.8618				
Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/jc60002a003			Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/jc60002a003			
T / K =	363.15		T / K =	548.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁	
0.7373	0.0043	0.0520	61.36	0.0070	0.0290	
0.8191	0.0151	0.1539	67.91	0.0330	0.1120	
0.8962	0.0269	0.2337	73.08	0.0650	0.1770	
0.9967	0.0459	0.3200				
1.083	0.0673	0.3823				
1.196	0.1094	0.4530				
1.288	0.1706	0.5058				
1.356	0.2464	0.5449				
1.407	0.3236	0.5763				
1.442	0.3880	0.6010				
1.456	0.4170	0.6123				
1.496	0.5044	0.6480				
1.526	0.5804	0.6830				
1.545	0.6340	0.7106				
1.570	0.7243	0.7639				
1.578	0.7636	0.7901				
1.585	0.8083	0.8224				
1.589	0.8578	0.8618				
						CRIT

77.22	0.1050	0.2330	
80.88	0.1490	0.2770	
84.12	0.2010	0.3220	
88.39	0.2730	0.3770	
92.73	0.3480	0.4290	
93.98	0.3740	0.4410	
95.98	0.4140	0.4650	
97.98	0.4550	0.4860	
98.60	0.5100	0.5100	CRIT

Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003

T / K =	573.15		
P / bar	x ₁	y ₁	
88.46	0.0060	0.0240	
95.29	0.0300	0.0870	
101.35	0.0570	0.1380	
105.83	0.0910	0.1860	
112.66	0.1280	0.2280	
118.59	0.1780	0.2760	
123.07	0.2460	0.3150	
125.48	0.3300	0.3300	CRIT

Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003

T / K =	598.15		
P / bar	x ₁	y ₁	
123.97	0.0070	0.0180	
133.55	0.0350	0.0750	
140.10	0.0630	0.1140	
143.76	0.0840	0.1340	
150.65	0.1210	0.1730	
155.13	0.1610	0.1910	
157.06	0.1900	0.1920	
157.06	0.1910	0.1910	CRIT

Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003

T / K =	623.15		
P / bar	x ₁	y ₁	
170.64	0.0080	0.0160	
180.64	0.0330	0.0570	
185.54	0.0520	0.0740	

Isobaric phase equilibrium data

Voutsas, Epaminondas C. - Pamouktsis, Christos - Argyris, Dimitrios - Pappa, Georgia D., Measurements and thermodynamic modeling of the ethanol-water system with emphasis to the azeotropic region, Fluid Phase Equilibria. 308 (2011) 135-141. doi:10.1016/j.fluid.2011.06.009

P / bar =	0.1971		
T / K	x ₁	y ₁	
323.53	0.0760	0.4070	
320.52	0.1410	0.5100	
318.05	0.2600	0.5920	
317.04	0.3900	0.6320	
316.35	0.4990	0.6790	
315.90	0.5990	0.7060	
315.55	0.6880	0.7600	
315.29	0.7990	0.8260	
315.26	0.8050	0.8280	
315.19	0.8410	0.8540	
315.15	0.8830	0.8880	
315.16	0.9130	0.9150	
315.16	0.9160	0.9160	AZEO

Jones, C. A. - Schoenborn, E. M. - Colburn, A. P., Equilibrium Still for Miscible Liquids, Industrial & Engineering Chemistry. 35 (1943) 666-672. doi:10.1021/ie50402a009

P / bar =	1.013		
T / K	x ₁	y ₁	
368.65	0.0180	0.1790	
363.75	0.0540	0.3375	
358.55	0.1240	0.4700	
356.85	0.1760	0.5140	
355.90	0.2300	0.5420	
355.15	0.2880	0.5700	
354.15	0.3850	0.6120	
353.65	0.4400	0.6330	
352.95	0.5140	0.6570	
352.05	0.6730	0.7350	
351.41	0.8400	0.8500	

Hughes, H.E. - Maloney, J.O., Application of radioactive tracers to diffusional operations. Binary and ternary equilibrium data, Chem. Eng. Progr. 48 (1952) 192-200.

P / bar =	1.013		
T / K	x ₁	y ₁	
372.08	0.0044	0.0510	
370.20	0.0110	0.1230	
365.45	0.0340	0.2610	
361.47	0.0680	0.3830	

SA-SA systems (BAC = 9)

360.62	0.0770	0.4110	360.45	0.0850	0.4110	
358.64	0.1160	0.4640	359.25	0.1050	0.4580	
357.90	0.1350	0.4760	358.35	0.1250	0.4880	
357.49	0.1470	0.4990	357.85	0.1350	0.4840	
356.62	0.1770	0.5160	354.95	0.3150	0.5710	
356.57	0.1780	0.5190	354.75	0.3210	0.5720	
356.09	0.2070	0.5360	352.65	0.5560	0.6750	
355.65	0.2330	0.5440	352.35	0.6020	0.6950	
355.71	0.2360	0.5410	352.25	0.6430	0.7130	
355.14	0.2700	0.5620	351.75	0.6890	0.7410	
354.99	0.2870	0.5720	351.35	0.9840	0.9840	AZEO
354.05	0.3610	0.6050	351.35	0.9870	0.9850	
354.07	0.3700	0.6010				
353.06	0.4800	0.6450				
351.31	0.9040	0.9000				

Kojima, K. - Tochigi, K. - Seki, H. - Watase, K., Determination of vapor-liquid equilibriums from boiling point curves, Kagaku Kogaku. 32 (1968) 149-153. doi:10.1252/kakoronbunshu1953.32.149

P / bar = 1.013

T / K	x ₁	y ₁
363.15	0.0500	0.3372
359.08	0.1000	0.4521
357.12	0.1500	0.5056
356.05	0.2000	0.5359
355.29	0.2500	0.5589
354.67	0.3000	0.5794
354.14	0.3500	0.5987
353.67	0.4000	0.6177
353.25	0.4500	0.6371
352.90	0.5000	0.6558
352.57	0.5500	0.6765
352.28	0.6000	0.6986
352.00	0.6500	0.7250
351.75	0.7000	0.7550
351.57	0.7500	0.7840
351.45	0.8000	0.8167
351.37	0.8500	0.8591
351.35	0.9000	0.8959
351.39	0.9500	0.9474

Bloom, C. H. - Clump, C. W. - Koeckert, A. H., Simultaneous Measurement of Vapor-Liquid Equilibria and Latent Heats of Vaporization, Industrial & Engineering Chemistry. 53 (1961) 829-832. doi:10.1021/ie50622a029

P / bar = 1.013

T / K	x ₁	y ₁
367.45	0.0210	0.1990
365.05	0.0330	0.2720
363.15	0.0500	0.3530

Stabnikov, V.N. - Matyushev, B.Z. - Protsyuk, T.B. - Yushchenko, N.M., Equilibrium in the ethyl alcohol-water system at atmospheric pressure, Pishch. Promst. Kiev. 15 (1972) 49-56.

P / bar = 1.013

T / K	x ₁	y ₁
372.96	0.0010	0.0100
372.77	0.0020	0.0205
372.58	0.0030	0.0312
372.39	0.0040	0.0421
372.20	0.0050	0.0532
372.01	0.0060	0.0644
371.82	0.0070	0.0753
371.63	0.0080	0.0858
371.44	0.0090	0.0958
371.25	0.0100	0.1040
370.73	0.0120	0.1200
370.21	0.0140	0.1360
369.69	0.0160	0.1509
369.17	0.0180	0.1655
368.65	0.0200	0.1800
368.08	0.0220	0.1943
367.61	0.0240	0.2080
367.09	0.0260	0.2205
366.57	0.0280	0.2327
366.05	0.0300	0.2442
365.00	0.0350	0.2695
364.20	0.0400	0.2905
363.62	0.0450	0.3075
363.05	0.0500	0.3245
362.60	0.0550	0.3400
362.07	0.0600	0.3545
361.65	0.0650	0.3660
361.28	0.0700	0.3775
360.91	0.0750	0.3885
360.60	0.0800	0.3990
360.25	0.0850	0.4091

SA-SA systems (BAC = 9)

359.92	0.0900	0.4190	353.25	0.4700	0.6355	
359.61	0.0950	0.4283	353.18	0.4800	0.6395	
359.35	0.1000	0.4370	353.11	0.4900	0.6435	
359.11	0.1050	0.4450	353.04	0.5000	0.6475	
358.88	0.1100	0.4528	352.99	0.5100	0.6520	
358.65	0.1150	0.4605	352.92	0.5200	0.6565	
358.43	0.1200	0.4675	352.90	0.5300	0.6610	
358.25	0.1250	0.4740	352.86	0.5400	0.6660	
358.05	0.1300	0.4800	352.80	0.5500	0.6710	
357.87	0.1350	0.4855	352.75	0.5600	0.6760	
357.70	0.1400	0.4900	352.70	0.5700	0.6810	
357.51	0.1450	0.4940	352.65	0.5800	0.6865	
357.35	0.1500	0.4980	352.59	0.5900	0.6920	
357.31	0.1550	0.5002	352.55	0.6000	0.6980	
357.07	0.1600	0.5055	352.50	0.6100	0.7030	
356.93	0.1650	0.5090	352.45	0.6200	0.7090	
356.80	0.1700	0.5120	352.42	0.6300	0.7145	
356.65	0.1750	0.5145	352.35	0.6400	0.7200	
356.52	0.1800	0.5175	352.30	0.6500	0.7255	
356.40	0.1850	0.5200	352.25	0.6600	0.7310	
356.27	0.1900	0.5230	352.20	0.6700	0.7365	
356.15	0.1950	0.5255	352.15	0.6800	0.7420	
356.05	0.2000	0.5280	352.10	0.6900	0.7475	
355.93	0.2100	0.5330	352.04	0.7000	0.7530	
355.70	0.2200	0.5375	352.01	0.7100	0.7590	
355.58	0.2300	0.5420	351.95	0.7200	0.7650	
355.43	0.2400	0.5460	351.91	0.7300	0.7710	
355.31	0.2500	0.5505	351.86	0.7400	0.7770	
355.20	0.2600	0.5545	351.81	0.7500	0.7830	
355.09	0.2700	0.5590	351.75	0.7600	0.7890	
355.00	0.2800	0.5635	351.72	0.7700	0.7950	
354.90	0.2900	0.5680	351.68	0.7800	0.8015	
354.79	0.3000	0.5725	351.65	0.7900	0.8080	
354.70	0.3100	0.5765	351.62	0.8000	0.8155	
354.60	0.3200	0.5805	351.59	0.8100	0.8225	
354.49	0.3300	0.5840	351.55	0.8200	0.8300	
354.40	0.3400	0.5880	351.52	0.8300	0.8385	
354.30	0.3500	0.5920	351.49	0.8400	0.8470	
354.20	0.3600	0.5955	351.46	0.8500	0.8560	
354.10	0.3700	0.5992	351.43	0.8600	0.8645	
354.02	0.3800	0.6032	351.39	0.8700	0.8730	
353.90	0.3900	0.6068	351.36	0.8800	0.8806	
353.81	0.4000	0.6102	351.33	0.8900	0.8905	
353.72	0.4100	0.6135	351.35	0.9000	0.8990	
353.63	0.4200	0.6170	351.40	0.9062	0.9062	AZEO
353.54	0.4300	0.6205	351.40	0.9100	0.9075	
353.44	0.4400	0.6245	351.45	0.9190	0.9158	
353.40	0.4500	0.6280				
353.33	0.4600	0.6320				

Otsuki, H. - Williams, F.C., Effect of pressure on vapor-liquid equilibria for the system ethyl alcohol-water, Chem. Eng. Progr. Symp. Ser. 49 (1953) 55-67.

P / bar =	3.448	
T / K	x_1	y_1
408.65	0.0076	0.0718
404.35	0.0230	0.1910
401.85	0.0392	0.2650
399.25	0.0590	0.3210
398.55	0.0675	0.3380
396.45	0.0866	0.3910
395.65	0.1010	0.4110
394.45	0.1200	0.4330
393.55	0.1350	0.4540
392.55	0.1840	0.4920
390.25	0.2630	0.5360
389.45	0.3240	0.5660
388.45	0.4210	0.6040
387.75	0.4960	0.6380
387.05	0.5880	0.6840
386.45	0.6880	0.7390
386.05	0.8060	0.8200

Otsuki, H. - Williams, F.C., Effect of pressure on vapor-liquid equilibria for the system ethyl alcohol-water, Chem. Eng. Progr. Symp. Ser. 49 (1953) 55-67.

P / bar =	6.895	
T / K	x_1	y_1
435.25	0.0075	0.0570
433.55	0.0141	0.1090
430.15	0.0275	0.1850
427.15	0.0412	0.2550
424.75	0.0583	0.3100
424.55	0.0635	0.3140
422.65	0.0807	0.3560
420.95	0.1030	0.3860
419.25	0.1390	0.4260
417.95	0.1710	0.4560
415.85	0.2530	0.5070
414.65	0.3150	0.5400
413.05	0.4320	0.5940
412.15	0.5130	0.6340
411.35	0.5890	0.6730
410.65	0.6610	0.7170
410.05	0.7610	0.7850

Enthalpy of mixing

Friese, T. - Ulbig, P. - Schulz, S. - Wagner, K., Effect of NaCl or KCl on the Excess Enthalpies of Alkanol + Water

Mixtures at Various Temperatures and Salt Concentrations 44 (1999) 701-714. doi:10.1021/je980303x

T / K =	285.65	
P / bar =	UNKNOWN (1.0132)	
$h^M / J.mol^{-1}$	x_1	
-288.50	0.0250	
-534.30	0.0500	
-723.90	0.0750	
-854.90	0.1000	
-929.40	0.1250	
-958.50	0.1500	
-958.20	0.1750	
-938.50	0.2000	
-910.70	0.2250	
-879.30	0.2500	
-845.20	0.2750	
-806.80	0.3000	
-717.20	0.3600	
-635.70	0.4200	
-559.80	0.4800	
-490.50	0.5400	
-430.20	0.6000	
-381.30	0.6600	
-335.40	0.7200	
-291.60	0.7800	
-242.70	0.8400	
-178.20	0.9010	
-86.00	0.9590	

Ott, J.B. - Stouffer, C.E. - Cornett, G.V. - Woodfield, B.F. - Wirthlin, R.C. - Christensen, J.J. - Deiters, U.K., Excess enthalpies for (ethanol + water) at 298.15 K and pressures of 0.4, 5, 10, and 15 MPa, The Journal of Chemical Thermodynamics. 18 (1986) 1-12. doi:10.1016/0021-9614(86)90036-4

T / K =	298.15	
P / bar =	100.00	
$h^M / J.mol^{-1}$	z_1	
-290.30	0.0303	
-580.10	0.0705	
-707.00	0.1005	
-755.90	0.1206	
-781.50	0.1412	
-788.20	0.1606	
-775.60	0.2012	
-725.60	0.2514	
-664.00	0.3012	
-599.60	0.3520	
-536.90	0.4027	
-480.90	0.4518	

SA-SA systems (BAC = 9)

-428.60	0.5023	-8.700	0.0100
-384.20	0.5510	-14.20	0.0198
-343.50	0.6020	-16.40	0.0301
-310.60	0.6525	-15.10	0.0403
-281.10	0.7012	-11.50	0.0503
-256.70	0.7507	6.700	0.0736
-227.20	0.8005	39.80	0.1000
-197.00	0.8505	76.00	0.1241
-152.50	0.8999	120.40	0.1504
-93.20	0.9482	199.70	0.2002

Friese, T. - Ulbig, P. - Schulz, S. - Wagner, K., Effect of NaCl or KCl on the Excess Enthalpies of Alkanol + Water Mixtures at Various Temperatures and Salt Concentrations 44 (1999) 701-714.

doi:10.1021/je980303x

T / K = 338.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$

x_1

-108.80	0.0250	463.20	0.6006
-188.60	0.0500	438.40	0.6511
-238.50	0.0750	402.90	0.6999
-261.90	0.1000	356.20	0.7495
-263.90	0.1250	297.80	0.7996
-253.30	0.1500	230.00	0.8497
-232.50	0.1750	156.60	0.8993
-208.90	0.2000	85.50	0.9478
-156.90	0.2500		
-100.60	0.3000		
-49.00	0.3500		
-2.800	0.4000		
36.20	0.4500		
66.70	0.5000		
87.70	0.5500		
99.50	0.6000		
102.10	0.6500		
96.80	0.7000		
83.10	0.7500		
42.30	0.8490		
30.70	0.9010		
23.70	0.9500		

Ott, J.B - Stouffer, C.E - Cornett, G.V - Woodfield, B.F - Guanquan, Che - Christensen, J.J, Excess enthalpies for (ethanol + water) at 398.15, 423.15, 448.15, and 473.15 K and at pressures of 5 and 15 MPa. Recommendations for choosing (ethanol + water) as an HmE reference mixture, The Journal of Chemical Thermodynamics. 19 (1987) 337-348. doi:10.1016/0021-9614(87)90115-7

T / K = 423.15

P / bar = 50.00

$h^M / \text{J.mol}^{-1}$

z_1

165.20	0.0504
331.90	0.1002
479.30	0.1508
602.90	0.2007
700.60	0.2507
780.90	0.3005
839.20	0.3512
878.80	0.4018
895.00	0.4509
894.90	0.5014
877.20	0.5501
839.80	0.6013
789.20	0.6518
718.60	0.7005

Ott, J.B. - Cornett, G.V. - Stouffer, C.E. - Woodfield, B.F. - Guanquan, C. - Christensen, J.J., Excess enthalpies of (ethanol+water) at 323.15, 333.15, 348.15, and 373.15 K and from 0.4 to 15 MPa, The Journal of Chemical Thermodynamics. 18 (1986) 867-875. doi:10.1016/0021-9614(86)90121-7

T / K = 373.15

P / bar = 10.00

$h^M / \text{J.mol}^{-1}$

z_1

635.80	0.7501	1797.0	0.6000
533.40	0.8001	1705.0	0.6500
420.20	0.8501	1529.0	0.7000
293.80	0.8996	1382.0	0.7500
160.00	0.9480	1096.0	0.8000

Ott, J.B - Stouffer, C.E - Cornett, G.V - Woodfield, B.F - Guanquan, Che - Christensen, J.J, Excess enthalpies for (ethanol + water) at 398.15, 423.15, 448.15, and 473.15 K and at pressures of 5 and 15 MPa. Recommendations for choosing (ethanol + water) as an HmE reference mixture, The Journal of Chemical Thermodynamics. 19 (1987) 337-348. doi:10.1016/0021-9614(87)90115-7

T / K = 473.15

P / bar = 50.00

$h^M / \text{J.mol}^{-1}$ z_1

274.80	0.0504
506.00	0.1002
695.30	0.1508
847.20	0.2007
961.90	0.2507
1044.0	0.3005
1104.1	0.3512
1137.1	0.4018
1140.0	0.4509
1137.9	0.5014
1110.0	0.5501
1056.0	0.6013
984.80	0.6518
896.40	0.7005
785.10	0.7501
659.90	0.8001
514.50	0.8501
357.90	0.8996
187.00	0.9480

Wormald, C.J. - Lloyd, M.J., Excess enthalpies for (water + ethanol) at T= 398 K to T= 548 K and p= 15 MPa, The Journal of Chemical Thermodynamics. 28 (1996) 615-626. doi:10.1006/jcht.1996.0058

T / K = 538.00

P / bar = 150.00

$h^M / \text{J.mol}^{-1}$ z_1

1354.0	0.2000
1550.0	0.2500
1705.0	0.3000
1800.0	0.3500
1868.0	0.4000
1917.0	0.4500
1920.0	0.5000
1861.0	0.5500

650.00 0.9000

Heat capacity of mixing

Benson, George C. - D'Arcy, Patrick J., Excess isobaric heat capacities of water-n-alcohol mixtures, Journal of Chemical & Engineering Data. 27 (1982) 439-442. doi:10.1021/je00030a021

T / K = 288.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

1.620	0.0102
2.380	0.0152
3.070	0.0198
3.240	0.0209
3.870	0.0252
4.530	0.0298
6.090	0.0412
7.010	0.0486
7.440	0.0519
7.560	0.0527
7.730	0.0543
8.940	0.0646
9.350	0.0688
11.45	0.0922
11.56	0.0930
11.95	0.0996
12.65	0.1100
13.14	0.1201
13.40	0.1275
13.70	0.1406
13.59	0.1502
13.91	0.1581
13.68	0.1695
13.81	0.1757
13.13	0.2021
13.31	0.2023
12.87	0.2280
12.80	0.2311
12.45	0.2434
12.47	0.2454
12.38	0.2465
12.49	0.2493

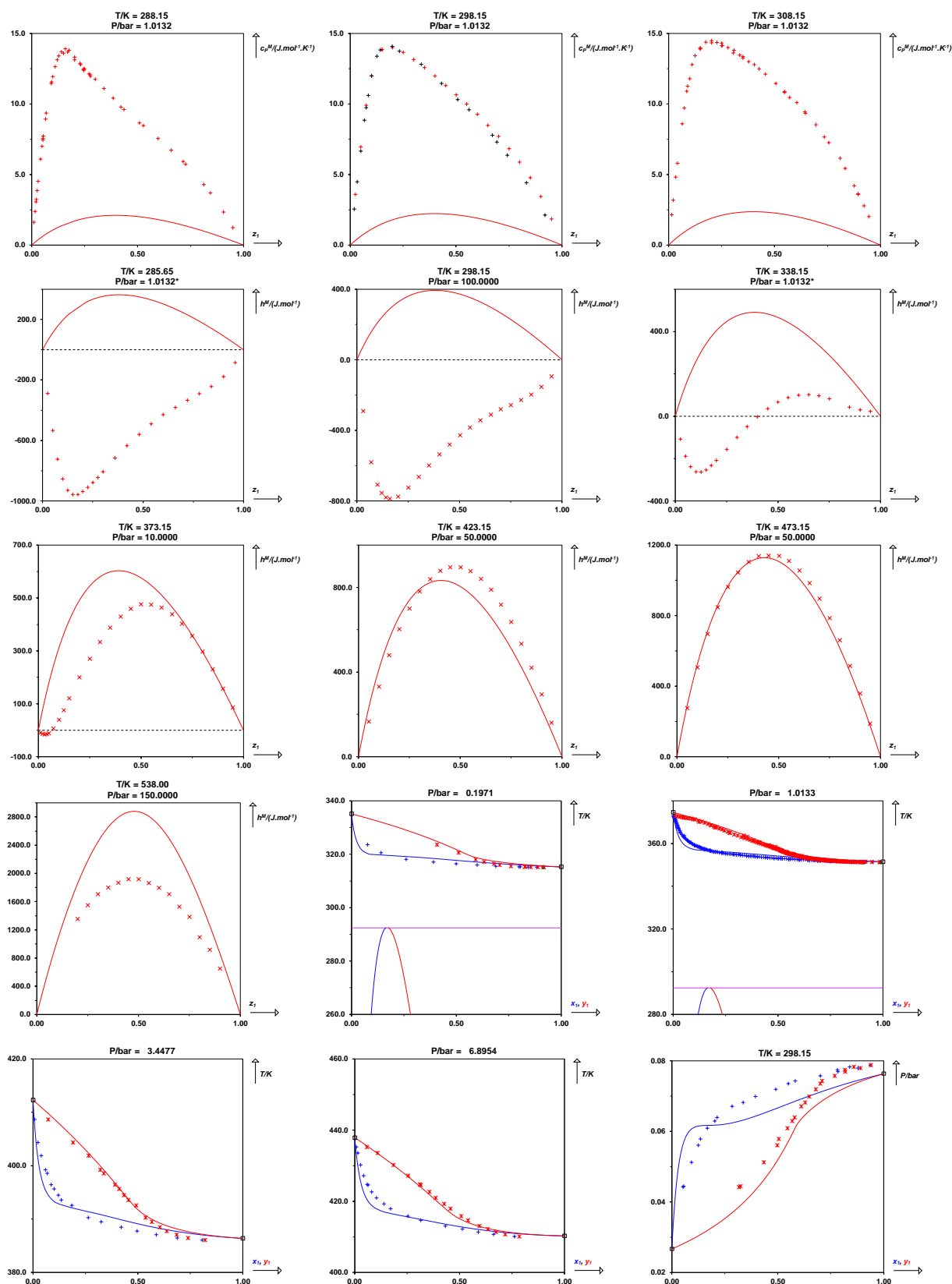
14.34	0.2024
14.36	0.2281
14.32	0.2503
14.13	0.2503
14.14	0.2525
14.00	0.2792
13.61	0.3056
13.81	0.3080
13.46	0.3355
13.37	0.3507
13.25	0.3507
13.00	0.3779
12.79	0.4048
12.49	0.4264
12.12	0.4567
11.46	0.5065
10.89	0.5465
10.82	0.5465
10.45	0.5707
10.09	0.6049
9.450	0.6432
9.330	0.6458
8.530	0.6952
7.650	0.7341
7.250	0.7561
6.150	0.8091
5.440	0.8337
4.200	0.8751
3.630	0.8946
3.600	0.8946
2.780	0.9222
2.030	0.9444

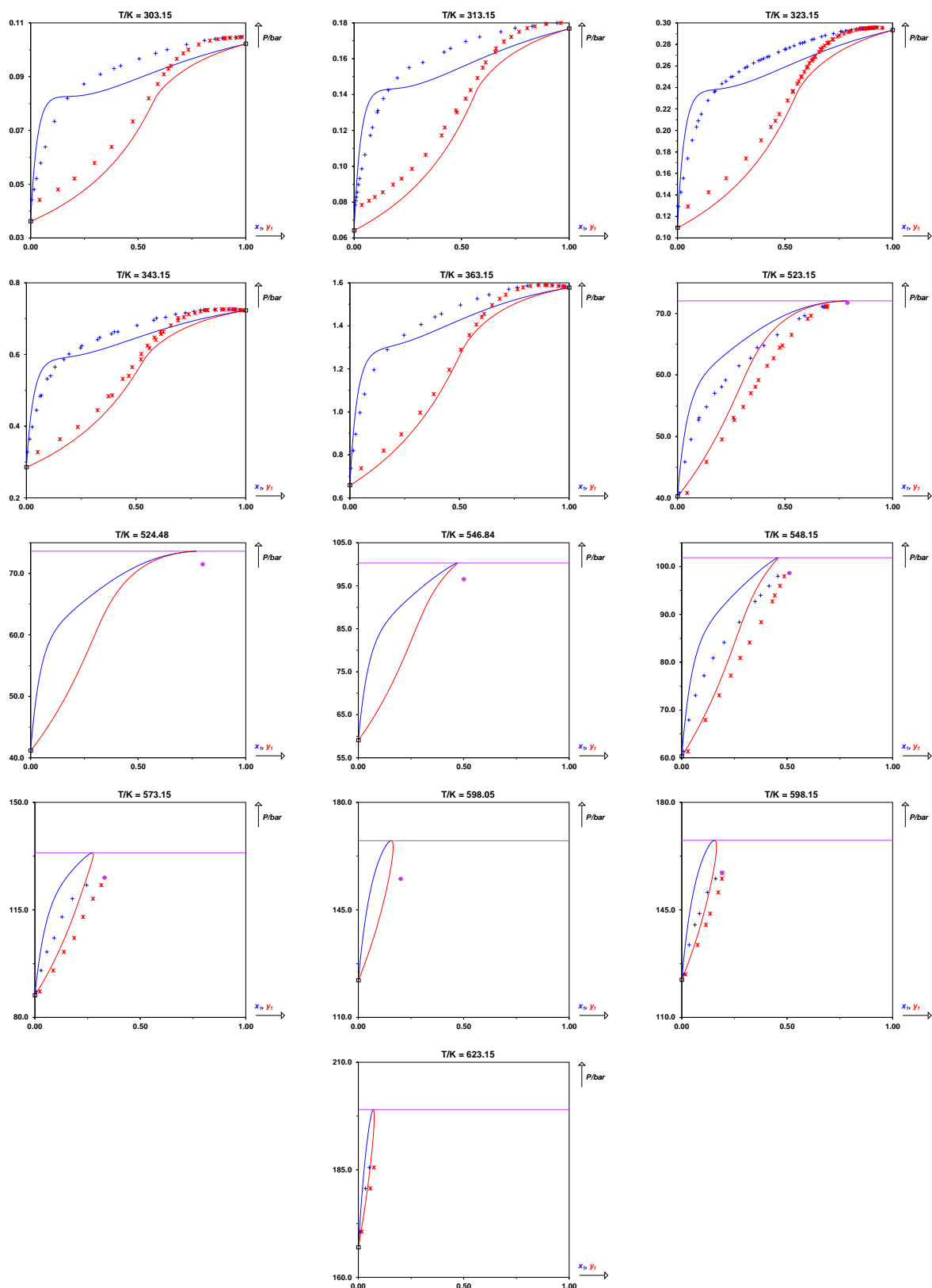
Critical point

Bazaev, A.R. - Abdulagatov, I.M. - Bazaev, E.A. - Abdurashidova, A., (p,v,T,x) Measurements of $\{(1-x)\text{H}_2\text{O}+x\text{C}_2\text{H}_5\text{OH}\}$ mixtures in the near-critical and supercritical regions, The Journal of Chemical Thermodynamics. 39 (2007) 385-411. doi:10.1016/j.jct.2006.08.002

T / K	P / bar	x_1
524.48	71.50	0.8000
546.84	96.50	0.5000
598.05	155.00	0.2000

SA-SA systems (BAC = 9)





ETHANOL (1) + ACETIC ACID (2)

CAS	64-17-5	64-19-7
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	QTBSBXVTEAMEQO-UHFFFAOYSA-N
T_c / K	514.00	591.95
P_c / bar	61.37	57.86
ω	0.644	0.467

Ideal

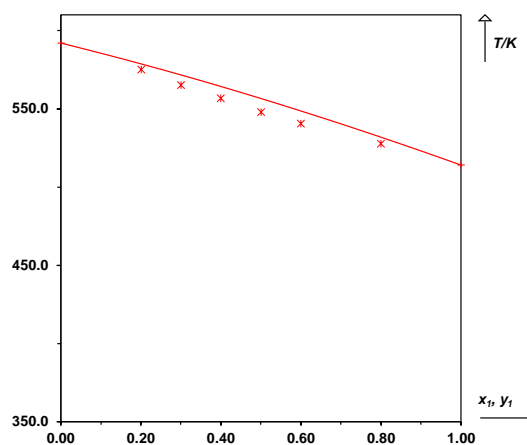
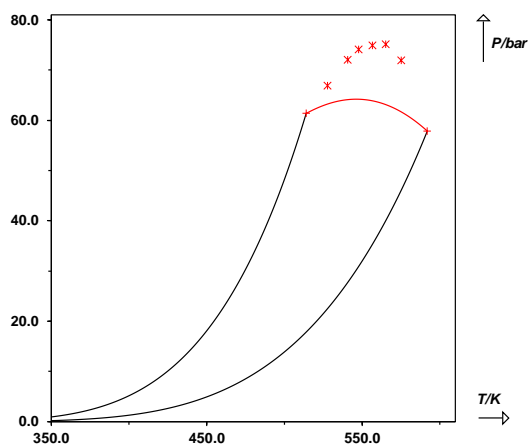
Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

A/MPa = 6.646

B/MPa = 33.63

Deviations

MAPE on x = 12 %MAPE on y = 26 %MAPE on x_c = 19 %MAPE on P_c = 12 %MAPE on h^M = 66 %

Isothermal phase equilibrium data

Wright, E. H. M. - Akhtar, B. A., Soluble surface films of short-chain monocarboxylic acids on organic and aqueous substrates, *Journal of the Chemical Society B: Physical Organic*. (1970) doi:10.1039/j29700000151

T / K =	303.15	
P / bar	x ₁	y ₁
0.0333	0.1000	0.2800
0.0400	0.2200	0.5000
0.0533	0.3600	0.6750
0.0600	0.4400	0.7667
0.0660	0.5100	0.8182
0.0747	0.6200	0.8839
0.0800	0.7000	0.9083
0.0880	0.8000	0.9470

Miyamoto, Shinji - Nakamura, Shinichi - Iwai, Yoshio - Arai, Yasuhiko, Measurement of Isothermal Vapor-Liquid Equilibria for Binary and Ternary Systems Containing Monocarboxylic Acid, *Journal of Chemical & Engineering Data*. 46 (2001) 1225-1230. doi:10.1021/je0003849

T / K =	323.20	
P / bar	x ₁	y ₁
0.0840	0.0580	0.1100
0.0900	0.0960	0.1800
0.1210	0.2900	0.5030
0.1600	0.4880	0.7630
0.2100	0.6860	0.9190
0.2720	0.8940	0.9860
0.2870	0.9470	0.9950
0.2960	0.9780	0.9980

Isobaric phase equilibrium data

Reichl, Albert - Daiminger, Ulrich - Schmidt, Adolf - Davies, Michael - Hoffmann, Ulrich - Brinkmeier, Clemens - Reder, Christoph - Marquardt, Wolfgang, A non-recycle flow still for the experimental determination of vapor-liquid equilibria in reactive systems, *Fluid Phase Equilibria*. 153 (1998) 113-134. doi:10.1016/S0378-3812(98)00409-9

P / bar =	1.014	
T / K	x ₁	y ₁
388.85	0.0311	0.0686
387.20	0.0586	0.1117
383.35	0.1288	0.2561
380.05	0.2003	0.3893
376.35	0.2808	0.5245
371.80	0.3991	0.6634
369.90	0.4408	0.7222

366.90	0.5129	0.8064
362.30	0.6396	0.8941
359.25	0.7162	0.9343
355.70	0.8432	0.9714
353.75	0.9110	0.9923

Enthalpy of mixing

Zhao, Junyang - Bao, Jingdan - Hu, Ying, Excess molar enthalpies of (an alkanol + a carboxylic acid) at 298.15 K measured with a Picker calorimeter, *The Journal of Chemical Thermodynamics*. 21 (1989) 811-818. doi:10.1016/0021-9614(89)90027-X

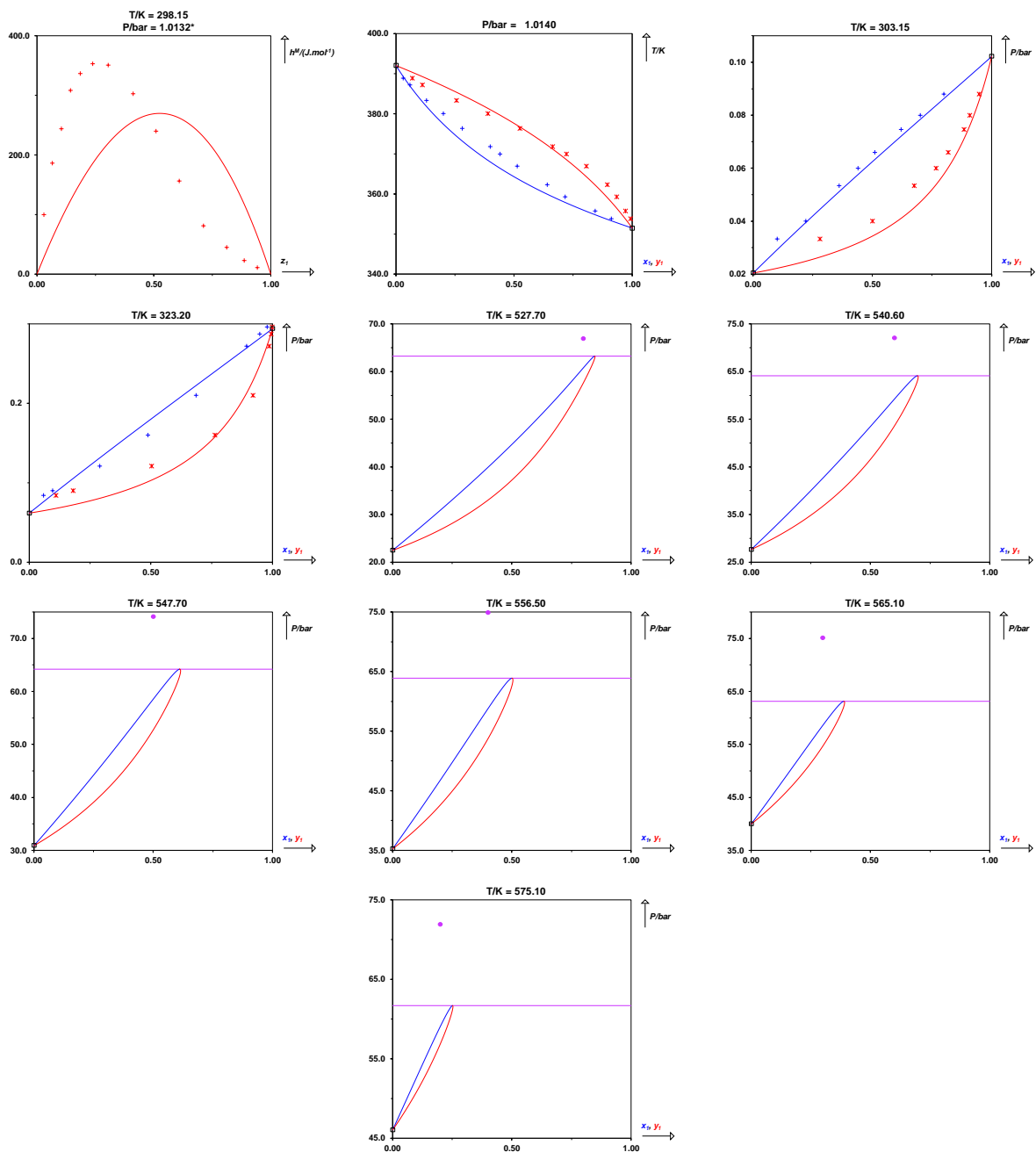
T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁	
99.86	0.0288	
186.27	0.0655	
244.02	0.1042	
308.25	0.1426	
336.55	0.1844	
352.95	0.2381	
350.73	0.3042	
302.90	0.4103	
239.78	0.5085	
156.21	0.6080	
80.96	0.7123	
44.62	0.8120	
23.02	0.8864	
10.84	0.9423	

Critical point

Hu, Tuoping - Qin, Zhangfeng - Wang, Guofu - Hou, Xianglin - Wang, Jianguo, Critical Properties of the Reacting Mixture in the Esterification of Acetic Acid with Ethanol, *Journal of Chemical & Engineering Data*. 49 (2004) 1809-1814. doi:10.1021/je049771z

T / K	P / bar	x ₁
527.70	66.90	0.8000
540.60	72.00	0.6000
547.70	74.10	0.5000
556.50	74.90	0.4000
565.10	75.10	0.3000
575.10	71.90	0.2000

SA-SA systems (BAC = 9)



ETHANOL (1) + ETHYL FORMATE (2)

CAS	64-17-5	109-94-4
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	WBJINCZRORDGAQ-UHFFFAOYSA-N
T_c / K	514.00	508.40
P_c / bar	61.37	47.40
ω	0.644	0.285

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 109.2$$

$$B/\text{MPa} = 90.22$$

Deviations

$$\text{MAPE on } x = 15 \%$$

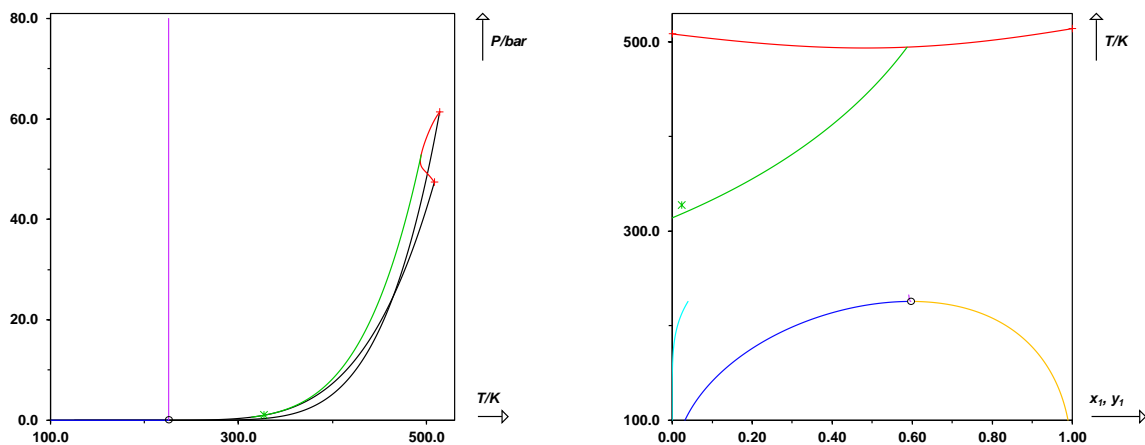
$$\text{MAPE on } y = 9.1 \%$$

$$\text{MAPE on } x_{\text{az}} = 104 \%$$

$$\text{MAPE on } P_{\text{az}} = 0.07 \%$$

$$\text{MAPE on } h^{\text{M}} = 30 \%$$

$$\text{MAPE on } c_p^{\text{M}} = 166 \%$$



Isothermal phase equilibrium data					
			330.89	0.5290	0.2800
			330.53	0.5050	0.2690
			330.25	0.4820	0.2590
Nagata, Isamu - Ohta, Tatsuhiko - Ogura, Michio - Yasuda, Shuhei, Excess Gibbs free energies and heats of mixing for binary systems: ethyl formate with methanol, ethanol, 1-propanol, and 2-propanol, Journal of Chemical & Engineering Data. 21 (1976) 310-313. doi:10.1021/je60070a020			329.96	0.4590	0.2490
			329.63	0.4290	0.2380
			329.36	0.4060	0.2300
			329.08	0.3790	0.2180
			328.81	0.3490	0.2090
T / K =	318.15		328.56	0.3230	0.1980
P / bar	x₁	y₁	328.27	0.2860	0.1820
0.3292	0.9490	0.6870	328.11	0.2600	0.1710
0.4609	0.8450	0.4460	327.84	0.2250	0.1550
0.5064	0.7990	0.3880	327.71	0.2060	0.1460
0.5426	0.7520	0.3530	327.58	0.1760	0.1310
0.6038	0.6310	0.2850	327.48	0.1610	0.1230
0.6245	0.5900	0.2670	327.34	0.1250	0.1040
0.6309	0.5710	0.2600	327.27	0.1020	0.0880
0.6793	0.4180	0.2130	327.24	0.0830	0.0740
0.6879	0.3650	0.1950	327.19	0.0650	0.0610
0.7155	0.2270	0.1510	327.23	0.0235	0.0235
0.7297	0.1090	0.0950	327.23	0.0190	0.0220
0.7330	0.0500	0.0460			

Isobaric phase equilibrium data

Soto, Ana - Hernández, Pablo - Ortega, Juan, Experimental VLE at 101.32 kPa in binary systems composed of ethyl methanoate and alkan-1-ols or alkan-2-ols and treatment of data using a correlation with temperature-dependent parameters, Fluid Phase Equilibria. 146 (1998) 351-370. doi:10.1016/S0378-3812(98)00193-9

P / bar =	1.013	
T / K	x₁	y₁
350.48	0.9890	0.9540
348.98	0.9750	0.8880
347.66	0.9620	0.8310
345.88	0.9420	0.7620
344.03	0.9200	0.6900
341.69	0.8860	0.6080
340.01	0.8590	0.5520
338.14	0.8200	0.4920
336.53	0.7790	0.4430
335.43	0.7460	0.4120
334.39	0.7100	0.3830
333.62	0.6810	0.3610
333.03	0.6550	0.3440
332.40	0.6240	0.3260
331.83	0.5910	0.3080
331.32	0.5580	0.2930

Enthalpy of mixing

López, M. - Fernández, J. - Sarmiento, F. - Legido, J. L. - Romani, L. - Jiménez, E. - Paz Andrade, M. I., Excess molar enthalpies at the temperature 298.15 K of (an n-alkyl formate + an n-alkanol) IV. $\{x\text{HCO}_2(\text{CH}_2)_i\text{CH}_3 + (1-x)\text{C}_j\text{H}_{2j+1}\text{OH}\}$ ($i = 0$ to 3 and $j = 1$ and 2), The Journal of Chemical Thermodynamics. 24 (1992) 809-814. doi:10.1016/S0021-9614(05)80225-3

T / K =	298.15	
P / bar =	UNKNOWN (1.0132)	
h^M / J.mol⁻¹	x₁	
340.00	0.9298	
604.00	0.8652	
861.00	0.7886	
976.00	0.7449	
1162.0	0.6551	
1245.0	0.5948	
1280.0	0.5698	
1330.0	0.5201	
1350.0	0.4697	
1356.0	0.4402	
1353.0	0.4149	
1342.0	0.3815	
1328.0	0.3543	
1290.0	0.3162	
1223.0	0.2749	

1127.0	0.2276	1206.2	0.4053
973.00	0.1719	1091.1	0.3105
708.00	0.1079	1077.3	0.2911
434.00	0.0588	928.63	0.2172

Hu, Jianhua - Tamura, Katsutoshi - Murakami, Sachio, Excess thermodynamic properties of binary mixtures of ethyl formate with benzene, ethanol, and 2,2,2-trifluoroethan-1-ol at 298.15 K, Fluid Phase Equilibria. 131 (1997) 197-212. doi:10.1016/S0378-3812(96)03230-X

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
104.60	0.9750
230.90	0.9500
458.40	0.9000
648.00	0.8500
815.00	0.8000
959.00	0.7500
1080.0	0.7000
1181.0	0.6500
1262.0	0.6000
1323.0	0.5500
1363.0	0.5000
1383.0	0.4500
1378.0	0.4000
1349.0	0.3500
1292.0	0.3000
1205.0	0.2500
1079.0	0.2000
908.00	0.1500
683.00	0.1000
381.60	0.0500
205.70	0.0250

Nagata, Isamu - Ohta, Tatsuhiko - Ogura, Michio - Yasuda, Shuhei, Excess Gibbs free energies and heats of mixing for binary systems: ethyl formate with methanol, ethanol, 1-propanol, and 2-propanol, Journal of Chemical & Engineering Data. 21 (1976) 310-313. doi:10.1021/je60070a020

T / K = 308.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
235.72	0.9487
298.10	0.9322
696.68	0.8186
969.66	0.7093
1117.0	0.6073
1188.2	0.5110
1205.4	0.5024

786.28	0.1639
603.32	0.1154
301.03	0.0500

Nagata, Isamu - Ohta, Tatsuhiko - Ogura, Michio - Yasuda, Shuhei, Excess Gibbs free energies and heats of mixing for binary systems: ethyl formate with methanol, ethanol, 1-propanol, and 2-propanol, Journal of Chemical & Engineering Data. 21 (1976) 310-313. doi:10.1021/je60070a020

T / K = 318.15
P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$	x_1
249.11	0.9473
784.61	0.8027
1020.3	0.7006
1169.4	0.6062
1223.4	0.4568
1213.3	0.4112
1138.4	0.3328
1140.1	0.3086
895.14	0.2005
812.24	0.1701
565.64	0.1056

Heat capacity of mixing

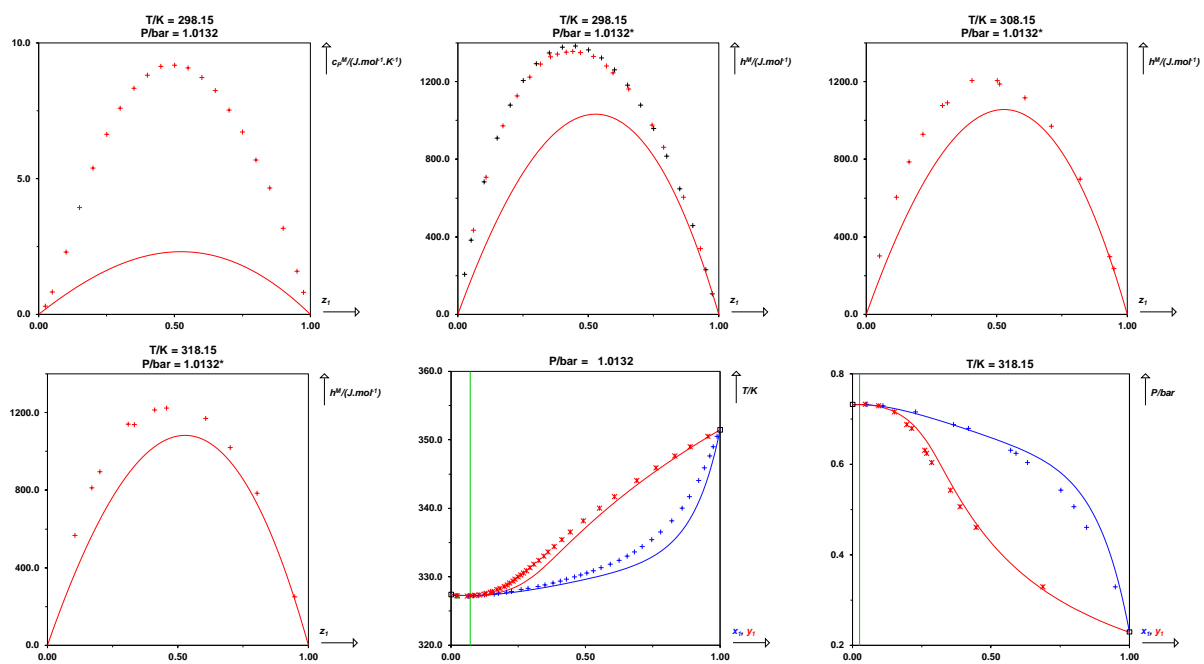
Hu, Jianhua - Tamura, Katsutoshi - Murakami, Sachio, Excess thermodynamic properties of binary mixtures of ethyl formate with benzene, ethanol, and 2,2,2-trifluoroethan-1-ol at 298.15 K, Fluid Phase Equilibria. 131 (1997) 197-212. doi:10.1016/S0378-3812(96)03230-X

T / K = 298.15
P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
0.8100	0.9750
1.590	0.9500
3.170	0.9000
4.650	0.8500
5.680	0.8000
6.720	0.7500
7.530	0.7000
8.240	0.6500
8.720	0.6000
9.080	0.5500
9.180	0.5000

SA-SA systems (BAC = 9)

9.130	0.4500
8.810	0.4000
8.330	0.3500
7.590	0.3000
6.640	0.2500
5.390	0.2000
3.930	0.1500
2.300	0.1000
0.8300	0.0500
0.3000	0.0250



ETHANOL (1) + 3-METHYL-1-BUTANOL (2)

CAS	64-17-5	123-51-3
InChiKey	LFQSCWFLJHTTHZ-UHFFFAOYSA-N	PHTQWCKDNZKARW-UHFFFAOYSA-N
T_c / K	514.00	577.20
P_c / bar	61.37	39.30
ω	0.644	0.590

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

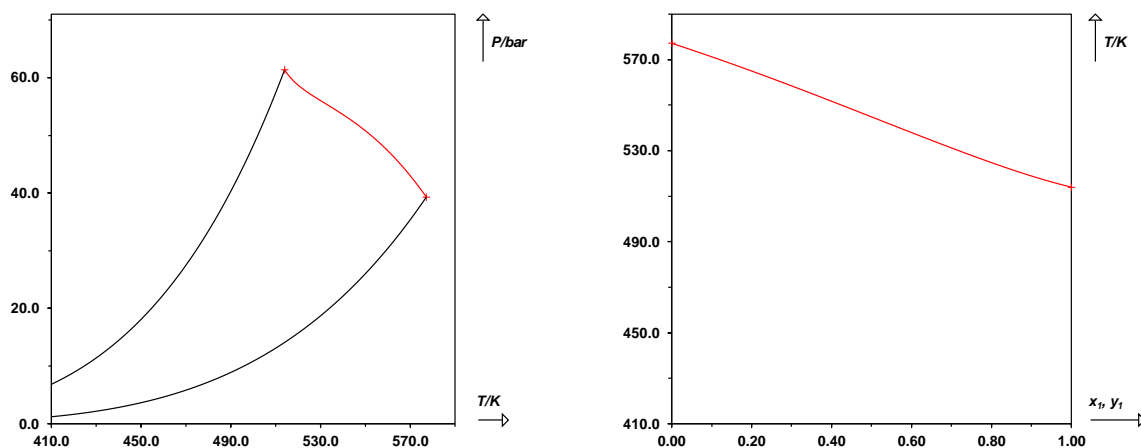
$$A/\text{MPa} = 6.763$$

$$B/\text{MPa} = -16.20$$

Deviations

$$\text{MAPE on } x = 5.9\%$$

$$\text{MAPE on } y = 8.5\%$$

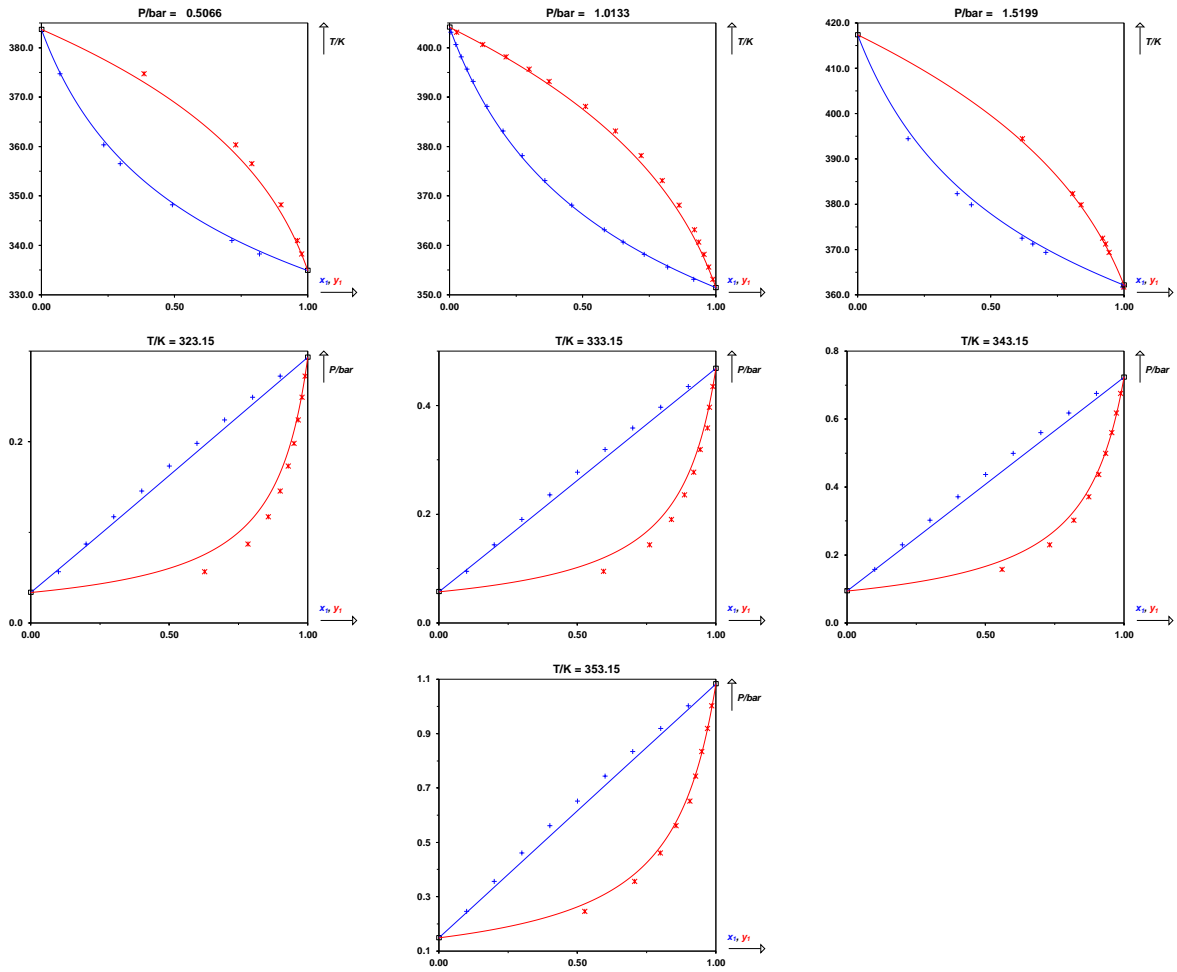


-----			0.4614	0.3000	0.7990
Isothermal phase equilibrium data			0.5614	0.4000	0.8560
-----			0.6514	0.5000	0.9060
Udovenko, V.V. - Frid, Ts.B., Heats of vaporization of binary mixtures. II, Zh. Fiz. Khim. 22 (1948) 1135-1145.			0.7434	0.6000	0.9260
T / K = 323.15			0.8335	0.7000	0.9490
P / bar	x ₁	y ₁	0.9194	0.8000	0.9690
0.0567	0.1000	0.6280	1.002	0.9000	0.9850
0.0872	0.2000	0.7840	-----		
0.1171	0.3000	0.8580	Isobaric phase equilibrium data		
0.1457	0.4000	0.9000	-----		
0.1732	0.5000	0.9290	Duran, Jairo A. - Córdoba, Fernando P. - Gil, Iván D. - Rodríguez, Gerardo - Orjuela, Alvaro, Vapor-liquid equilibrium of the ethanol+3-methyl-1-butanol system at 50.66, 101.33 and 151.99kPa, Fluid Phase Equilibria. 338 (2013) 128-134. doi:10.1016/j.fluid.2012.11.004		
0.1983	0.6000	0.9500	P / bar = 0.5066		
0.2241	0.7000	0.9660	T / K	x ₁	y ₁
0.2491	0.8000	0.9790	374.70	0.0697	0.3849
0.2722	0.9000	0.9900	360.32	0.2336	0.7298
Udovenko, V.V. - Frid, Ts.B., Heats of vaporization of binary mixtures. II, Zh. Fiz. Khim. 22 (1948) 1135-1145.			356.55	0.2951	0.7901
T / K = 333.15			348.21	0.4911	0.8990
P / bar	x ₁	y ₁	340.95	0.7153	0.9606
0.0949	0.1000	0.5940	338.27	0.8182	0.9772
0.1437	0.2000	0.7610	Gay, L., Distillation and rectification of complex mixtures. II, Chim. Ind. Genie Chim. 18 (1927) 187-203.		
0.1905	0.3000	0.8400	P / bar = 1.013		
0.2357	0.4000	0.8870	T / K	x ₁	y ₁
0.2774	0.5000	0.9200	403.15	0.0047	0.0265
0.3189	0.6000	0.9430	400.65	0.0235	0.1240
0.3588	0.7000	0.9700	398.15	0.0435	0.2125
0.3965	0.8000	0.9760	395.65	0.0650	0.2980
0.4348	0.9000	0.9890	393.15	0.0885	0.3735
Udovenko, V.V. - Frid, Ts.B., Heats of vaporization of binary mixtures. II, Zh. Fiz. Khim. 22 (1948) 1135-1145.			388.15	0.1405	0.5100
T / K = 343.15			383.15	0.2010	0.6230
P / bar	x ₁	y ₁	378.15	0.2725	0.7185
0.1572	0.1000	0.5600	373.15	0.3570	0.7980
0.2304	0.2000	0.7320	368.15	0.4590	0.8620
0.3020	0.3000	0.8180	363.15	0.5810	0.9193
0.3713	0.4000	0.8720	360.65	0.6520	0.9353
0.4366	0.5000	0.9080	358.15	0.7310	0.9552
0.4988	0.6000	0.9340	355.65	0.8185	0.9729
0.5600	0.7000	0.9550	353.15	0.9165	0.9889
0.6180	0.8000	0.9720	Duran, Jairo A. - Córdoba, Fernando P. - Gil, Iván D. - Rodríguez, Gerardo - Orjuela, Alvaro, Vapor-liquid equilibrium of the ethanol+3-methyl-1-butanol system at 50.66, 101.33 and 151.99kPa, Fluid Phase Equilibria. 338 (2013) 128-134. doi:10.1016/j.fluid.2012.11.004		
0.6755	0.9000	0.9870	P / bar = 1.520		
Udovenko, V.V. - Frid, Ts.B., Heats of vaporization of binary mixtures. II, Zh. Fiz. Khim. 22 (1948) 1135-1145.					
T / K = 353.15					
P / bar	x ₁	y ₁			
0.2467	0.1000	0.5260			
0.3564	0.2000	0.7070			

SA-SA systems (BAC = 9)

T / K	x_1	y_1
394.42	0.1887	0.6189
382.29	0.3729	0.8074
379.83	0.4265	0.8385
372.50	0.6166	0.9192
371.19	0.6578	0.9311
369.33	0.7068	0.9433
361.72	0.9940	0.9990

SA-SA systems (BAC = 9)



METHYL FORMATE (1) + METHANOL (2)

CAS	107-31-3	67-56-1
InChiKey	TZIHFWKZFHZASV-UHFFFAOYSA-N	OKKJLVBELUTLKV-UHFFFAOYSA-N
T_c / K	487.20	512.50
P_c / bar	60.00	80.84
ω	0.256	0.566

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 141.5$$

$$B/\text{MPa} = 122.4$$

Deviations

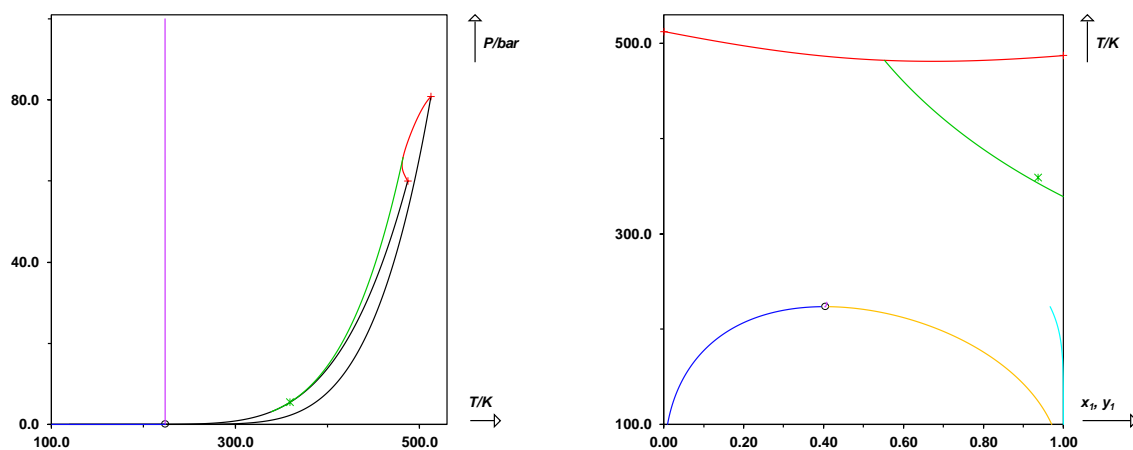
$$\text{MAPE on } x = 12 \%$$

$$\text{MAPE on } y = 7.1 \%$$

$$\text{MAPE on } x_{\text{az}} = 20 \%$$

$$\text{MAPE on } P_{\text{az}} = 1.7 \%$$

$$\text{MAPE on } h^{\text{M}} = 19 \%$$



Isothermal phase equilibrium data

Polak, Jiri - Lu, B.C.-Y, Excess Gibbs free energies and excess volumes of methyl formate + methanol and methyl formate + ethanol at 298.15 K, The Journal of Chemical Thermodynamics. 4 (1972) 469-476. doi:10.1016/0021-9614(72)90031-6

T / K =	298.15	
P / bar	x ₁	y ₁
0.2868	0.0509	0.4291
0.3650	0.0916	0.5641
0.4711	0.1707	0.6847
0.5174	0.2183	0.7216
0.5658	0.2808	0.7551
0.5975	0.3330	0.7718
0.6392	0.4191	0.7911
0.6713	0.5029	0.8092
0.6953	0.5788	0.8278
0.7080	0.6226	0.8397
0.7234	0.6785	0.8549
0.7349	0.7221	0.8658
0.7490	0.7788	0.8827
0.7656	0.8523	0.9038
0.7805	0.9260	0.9387

Kozub, Norbert - Schuberth, Horst - Leibnitz, Eberhard, Phasengleichgewichtsuntersuchungen dampfförmig-flüssig am System Methanol/Methylformiat unter Verwendung einer gaschromatographischen Analysenmethode, Journal für Praktische Chemie. 17 (1962) 282-292. doi:10.1002/prac.19620170505

T / K =	303.20	
P / bar	x ₁	y ₁
0.3933	0.0700	0.4790
0.4266	0.0830	0.5330
0.4533	0.1000	0.5600
0.4933	0.1220	0.6020
0.5000	0.1260	0.6000
0.5200	0.1390	0.6250
0.5226	0.1410	0.6270
0.5480	0.1620	0.6520
0.5720	0.1800	0.6730
0.6013	0.2070	0.6880
0.6120	0.2130	0.7110
0.6400	0.2450	0.7300
0.6813	0.2900	0.7570
0.7133	0.3300	0.7710
0.7399	0.3800	0.7920
0.7773	0.4400	0.8030
0.8173	0.5220	0.8200

0.8453	0.6250	0.8450
0.8839	0.7380	0.8770
0.8933	0.7880	0.8920
0.8999	0.8320	0.9100

Sundberg, Aarne T. - Uusi-Kyyny, Petri - Pakkanen, Minna - Alopaeus, Ville, Vapor-Liquid Equilibrium for Methoxymethane + Methyl Formate, Methoxymethane + Hexane, and Methyl Formate + Methanol, Journal of Chemical & Engineering Data. 56 (2011) 2634-2640. doi:10.1021/je200140m

T / K =	358.94	
P / bar	x ₁	y ₁
2.359	0.0108	0.0667
2.579	0.0300	0.1608
2.777	0.0488	0.2325
3.565	0.1459	0.4437
3.869	0.1962	0.5055
4.942	0.4971	0.6992
4.942	0.4988	0.6999
5.147	0.5983	0.7429
5.234	0.6483	0.7645
5.311	0.6982	0.7870
5.379	0.7484	0.8115
5.438	0.7976	0.8382
5.483	0.8486	0.8698
5.512	0.8988	0.9059
5.519	0.9370	0.9370

AZEO

Isobaric phase equilibrium data

Zeng, J. - Fu, C. - Hu, W.L., Study on the VLE for methyl formate-methanol system, Tianranqi Huagong. 25 (2000) 54-56.

P / bar =	1.013	
T / K	x ₁	y ₁
334.63	0.0192	0.1325
330.27	0.0472	0.2823
323.00	0.1120	0.4962
316.61	0.2090	0.6450
313.05	0.3009	0.7168
310.83	0.3891	0.7599
309.72	0.4472	0.7816
308.21	0.5502	0.8132
307.21	0.6384	0.8376
306.55	0.7077	0.8565
305.98	0.7720	0.8764
305.44	0.8404	0.9008
305.05	0.9026	0.9296
304.80	0.9589	0.9653

Enthalpy of mixing

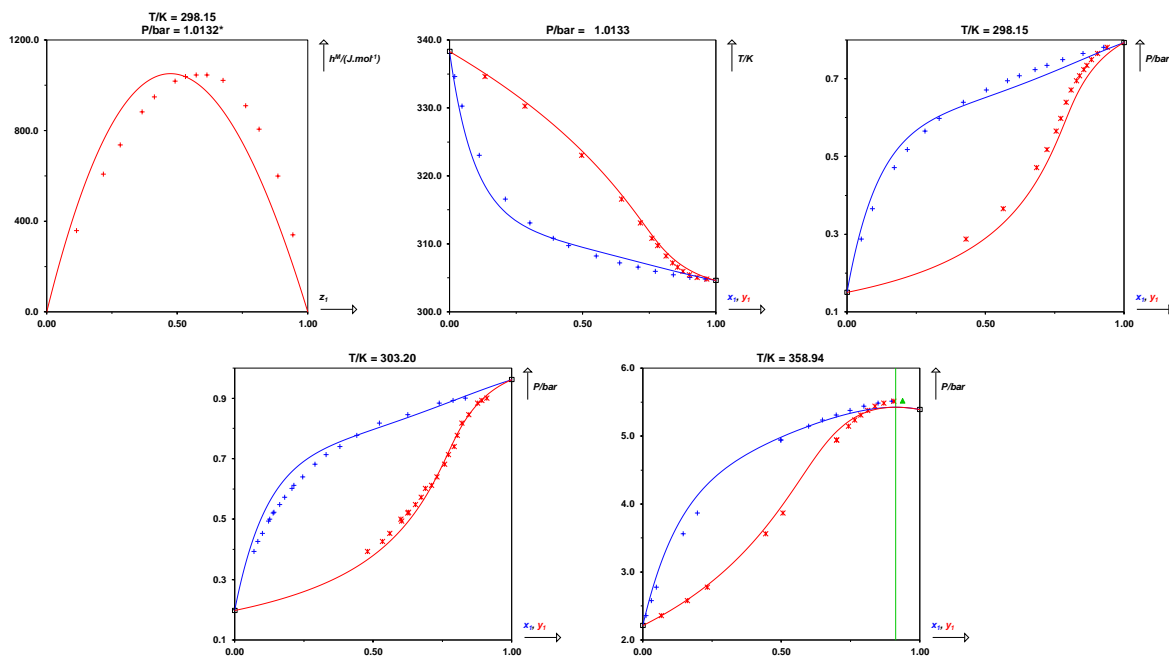
López, M. - Fernández, J. - Sarmiento, F. - Legido, J. L. - Romani, L. - Jiménez, E. - Paz Andrade, M. I., Excess molar enthalpies at the temperature 298.15 K of (an n-alkyl formate + an n-alkanol) IV. $\{x\text{HCO}_2(\text{CH}_2)_i\text{CH}_3 + (1-x)\text{C}_j\text{H}_{2j+1}\text{OH}\}$ ($i = 0$ to 3 and $j = 1$ and 2), The Journal of Chemical Thermodynamics. 24 (1992) 809-814. doi:10.1016/S0021-9614(05)80225-3

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J}\cdot\text{mol}^{-1}$	x_1
358.00	0.1135
608.00	0.2174
736.00	0.2815
882.00	0.3651
948.00	0.4122
1019.0	0.4914
1038.0	0.5311
1045.0	0.5724
1046.0	0.6134
1021.0	0.6749
909.00	0.7613
807.00	0.8135
600.00	0.8848
340.00	0.9432

SA-SA systems (BAC = 9)



ISOPROPANOL (1) + WATER (2)

CAS	67-63-0	7732-18-5
InChiKey	KFZMGEQAYNKOFK-UHFFFAOYSA-N	XLYOFNOQVPJJP-UHFFFAOYSA-N
T_c / K	508.30	647.10
P_c / bar	47.65	220.64
ω	0.663	0.345

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$A/\text{MPa} = 275.7$

$B/\text{MPa} = 10.07$

Deviations

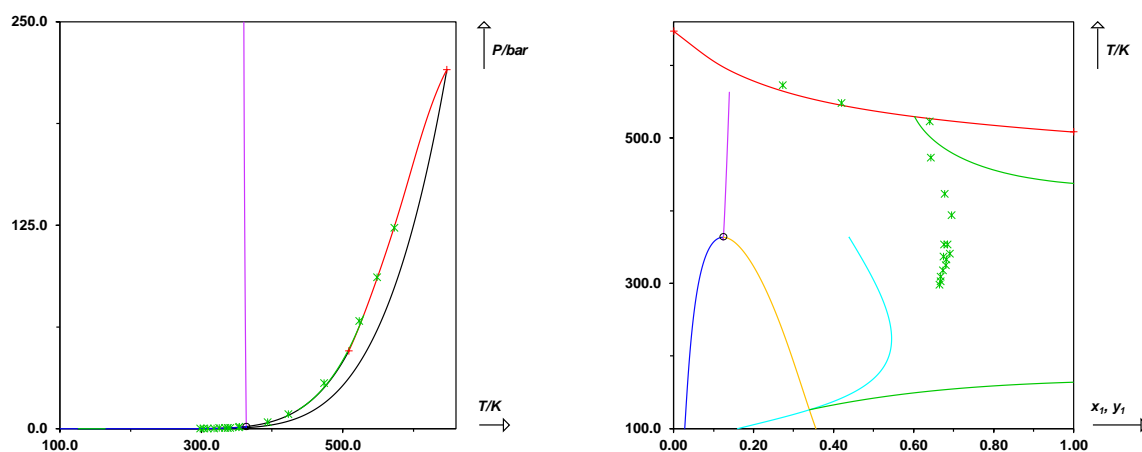
MAPE on $x = 108\%$

MAPE on $y = 51\%$

MAPE on $x_{\text{az}} = 11\%$

MAPE on $P_{\text{az}} = 7.3\%$

MAPE on $h^M = 65\%$



Isothermal phase equilibrium data					
Sazonov, V.P., Isothermal liquid-liquid-vapor equilibrium of nitromethane - isopropanol - water, Zh. Prikl. Khim. 59 (1986) 1451-1456.			0.1147	0.0101	0.1724
T / K = 298.15			0.1336	0.0244	0.3285
P / bar	x ₁	y ₁	0.1519	0.0357	0.4415
0.0426	0.0240	0.2420	0.1763	0.0784	0.5301
0.0548	0.1049	0.4840	0.1857	0.1359	0.5500
0.0605	0.1960	0.5390	0.1909	0.2202	0.5611
0.0636	0.3189	0.5720	0.1927	0.2642	0.5611
0.0654	0.4445	0.5980	0.1965	0.3428	0.5857
0.0657	0.5543	0.6220	0.1983	0.4174	0.6115
0.0659	0.6119	0.6400	0.2005	0.4802	0.6151
0.0665	0.6568	0.6600	0.2016	0.5052	0.6240
0.0665	0.6650	0.6650	0.2041	0.6350	0.6500
0.0665	0.6846	0.6730	0.2043	0.6724	0.6724
0.0660	0.7336	0.7070	0.2029	0.7520	0.7296
0.0649	0.8325	0.7760	0.2017	0.8118	0.7752
0.0623	0.9097	0.8580	0.1935	0.9212	0.8836
AZEO			Udovenko, V.V. - Mazanko, T.F., Liquid-Vapor Equilibrium in the Propan-2-ol - Water and Propan-2-ol - Benzene Systems, Zhurnal Fizicheskoi Khimii. 41 (1967) 1615-1620.		
T / K = 303.15			T / K = 333.15		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.0451	0.0015	0.0254	0.2236	0.0030	0.0931
0.0495	0.0111	0.1374	0.2376	0.0104	0.1672
0.0564	0.0231	0.2603	0.2757	0.0178	0.3370
0.0629	0.0357	0.3577	0.3036	0.0305	0.4269
0.0733	0.0649	0.4604	0.3669	0.0809	0.5241
0.0804	0.1168	0.5316	0.3805	0.1139	0.5453
0.0839	0.1970	0.5547	0.3942	0.1907	0.5611
0.0847	0.2271	0.5611	0.3988	0.2430	0.5740
0.0859	0.3120	0.5659	0.4061	0.3285	0.5790
0.0868	0.3958	0.5907	0.4118	0.3914	0.5941
0.0877	0.4477	0.5890	0.4186	0.4843	0.6259
0.0888	0.5009	0.6098	0.4216	0.5453	0.6295
0.0892	0.6369	0.6462	0.4254	0.6481	0.6713
0.0895	0.6672	0.6672	0.4258	0.6816	0.6816
0.0891	0.7542	0.7296	0.4258	0.6874	0.6935
0.0876	0.8245	0.7752	0.4189	0.8296	0.7993
0.0843	0.9363	0.8892	0.4041	0.9363	0.8892
AZEO			Sada, Eizo - Morisue, Tetsuo, ISOTHERMAL VAPOR-LIQUID EQUILIBRIUM DATA OF ISOPROPANOL-WATER SYSTEM, Journal of Chemical Engineering of Japan. 8 (1975) 191-195. doi:10.1252/jcej.8.191		
T / K = 318.15			T / K = 348.14		
P / bar	x ₁	y ₁	P / bar	x ₁	y ₁
0.1108	0.0061	0.1380	0.6445	0.0461	0.4185
Udovenko, V.V. - Mazanko, T.F., Liquid-Vapor Equilibrium in the Propan-2-ol - Water and Propan-2-ol - Benzene Systems, Zhurnal Fizicheskoi Khimii. 41 (1967) 1615-1620.			0.7139	0.0957	0.4916
T / K = 318.15			0.7490	0.1752	0.5168
P / bar	x ₁	y ₁	0.7715	0.2816	0.5365

SA-SA systems (BAC = 9)

0.8005	0.4779	0.5971	9.101	0.6610	0.6670	
0.8130	0.6046	0.6450	9.101	0.6775	0.6775	AZEO
0.8114	0.7622	0.7326	9.170	0.7100	0.6990	
0.7990	0.8581	0.8145	9.101	0.7450	0.7260	

Wu, Huey S. - Hagewiesche, Dan - Sandler, Stanley I., Vapor—liquid equilibria of 2-propanol + water + N,N-dimethyl formamide, Fluid Phase Equilibria. 43 (1988) 77-89. doi:10.1016/0378-3812(88)80073-6

T / K = 353.15

P / bar	x ₁	y ₁	
0.5138	0.0036	0.0829	
0.6076	0.0130	0.2231	
0.7212	0.0314	0.3602	
0.8412	0.0627	0.4647	
0.8576	0.0697	0.4812	
0.8731	0.0794	0.4913	
0.8876	0.0976	0.5037	
0.9013	0.1185	0.5090	
0.9219	0.1735	0.5333	
0.9276	0.1956	0.5343	
0.9376	0.2344	0.5415	
0.9516	0.2926	0.5528	
0.9693	0.3798	0.5688	
0.9848	0.4686	0.5898	
0.9961	0.5545	0.6227	
1.004	0.6764	0.6764	AZEO
1.003	0.6948	0.7001	
0.9898	0.8079	0.7809	
0.9798	0.8667	0.8296	
0.9483	0.9473	0.9208	

Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003

T / K = 423.15

P / bar	x ₁	y ₁	
5.171	0.0040	0.0940	
5.516	0.0100	0.1510	
6.067	0.0140	0.2330	
6.757	0.0260	0.3150	
7.722	0.0500	0.3820	
8.067	0.1040	0.4350	
8.274	0.1640	0.4610	
8.549	0.2530	0.5010	
8.549	0.2670	0.4900	
8.756	0.3780	0.5270	
9.032	0.4950	0.5740	
9.101	0.5700	0.6110	
9.101	0.5880	0.6210	

8.825 0.9050 0.8800
8.618 0.9410 0.9230

Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003

T / K = 473.15

P / bar	x ₁	y ₁	
18.48	0.0170	0.1450	
19.72	0.0240	0.1980	
21.03	0.0360	0.2530	
22.13	0.0520	0.2970	
23.37	0.0720	0.3360	
24.06	0.1050	0.3630	
24.89	0.1510	0.3900	
25.44	0.2010	0.4130	
27.17	0.3890	0.4950	
27.72	0.5210	0.5640	
28.06	0.5990	0.6130	
27.86	0.6100	0.6180	
27.92	0.6435	0.6435	AZEO
27.99	0.6500	0.6480	
27.79	0.6820	0.6730	
27.86	0.7060	0.6910	
27.37	0.7880	0.7620	
26.82	0.8620	0.8370	
26.13	0.9340	0.9170	

Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003

T / K = 523.15

P / bar	x ₁	y ₁	
43.09	0.0110	0.0780	
46.75	0.0250	0.1480	
49.23	0.0370	0.1810	
51.85	0.0560	0.2220	
54.54	0.0770	0.2670	
56.88	0.1160	0.3040	
58.95	0.1750	0.3390	
61.36	0.2510	0.3800	
64.12	0.3800	0.4480	
65.50	0.4890	0.5210	
66.19	0.5410	0.5570	

SA-SA systems (BAC = 9)

66.19	0.6050	0.6120		314.34	0.0510	0.4055	
66.19	0.6400	0.6400	AZEO	312.16	0.0795	0.4820	
				311.00	0.1395	0.5165	
Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003				310.74	0.1850	0.5285	
T / K = 548.15				310.29	0.2610	0.5475	
P / bar	x ₁	y ₁		310.02	0.3875	0.5705	
69.02	0.0260	0.1140		309.29	0.5080	0.6030	
72.19	0.0340	0.1480		309.32	0.5725	0.6250	
74.81	0.0500	0.1840		309.38	0.6495	0.6565	
77.36	0.0670	0.2110		309.53	0.6505	0.6565	
79.70	0.0870	0.2430		309.36	0.6580	0.6605	
82.05	0.1190	0.2700		309.15	0.6670	0.6670	AZEO
84.94	0.1580	0.2930		309.16	0.6860	0.6740	
86.94	0.2000	0.3190		309.22	0.7350	0.7040	
87.91	0.2230	0.3300		308.93	0.7385	0.7055	
88.87	0.2470	0.3420		309.38	0.7400	0.7070	
89.36	0.2620	0.3530		309.48	0.7715	0.7275	
90.32	0.2800	0.3590		309.54	0.8195	0.7665	
90.87	0.2910	0.3660		310.19	0.8840	0.8300	
91.22	0.2950	0.3790		310.80	0.9425	0.9040	
91.36	0.3100	0.3790					
92.73	0.3530	0.3950		Marzal, Paula - Montón, Juan B. - Rodrigo, Manuel A., Isobaric Vapor-Liquid Equilibria of the Water + 2-Propanol System at 30, 60, and 100 kPa, Journal of Chemical & Engineering Data. 41 (1996) 608-611. doi:10.1021/je9503113			
93.08	0.3690	0.3940		P / bar = 0.3000			
92.94	0.4190	0.4190	AZEO	T / K	x ₁	y ₁	
Barr-David, Frank - Dodge, B. F., Vapor-Liquid Equilibrium at High Pressures. The Systems Ethanol-Water and 2-Propanol-Water., Journal of Chemical & Engineering Data. 4 (1959) 107-121. doi:10.1021/je60002a003				340.26	0.0050	0.0870	
T / K = 573.15				338.93	0.0080	0.1410	
P / bar	x ₁	y ₁		336.69	0.0140	0.2270	
88.94	0.0030	0.0180		334.70	0.0220	0.3030	
117.14	0.1420	0.2530		332.61	0.0340	0.3710	
120.87	0.1950	0.2670		331.00	0.0430	0.4120	
123.49	0.2730	0.2730	AZEO	329.84	0.0540	0.4540	
				328.80	0.0690	0.4720	
				328.03	0.0890	0.4990	
				327.58	0.1130	0.5160	
				327.13	0.1390	0.5260	
				326.73	0.2170	0.5410	
				326.42	0.2800	0.5570	
				326.20	0.3400	0.5680	
				325.89	0.4150	0.5830	
				325.67	0.4900	0.6020	
				325.52	0.5590	0.6240	
				325.33	0.6310	0.6550	
				325.32	0.6800	0.6800	AZEO
				325.37	0.7120	0.6960	
				325.40	0.7710	0.7350	
				325.63	0.8290	0.7840	

Isobaric phase equilibrium data

Wilson, Abraham - Simons, Edward L., Vapor-Liquid Equilibria. 2-Propanol - Water System, Industrial & Engineering Chemistry. 44 (1952) 2214-2219. doi:10.1021/ie50513a063

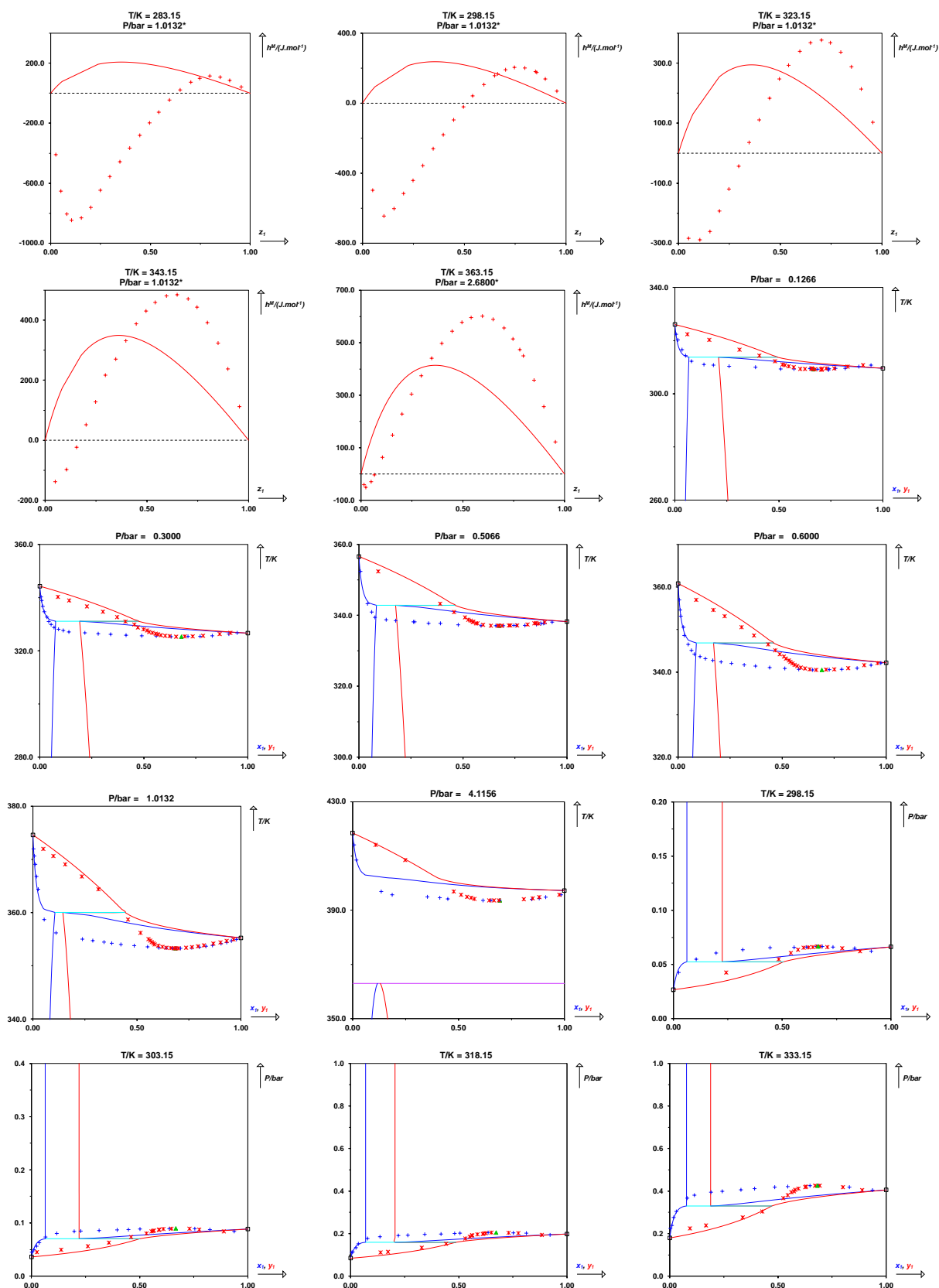
P / bar = 0.1267

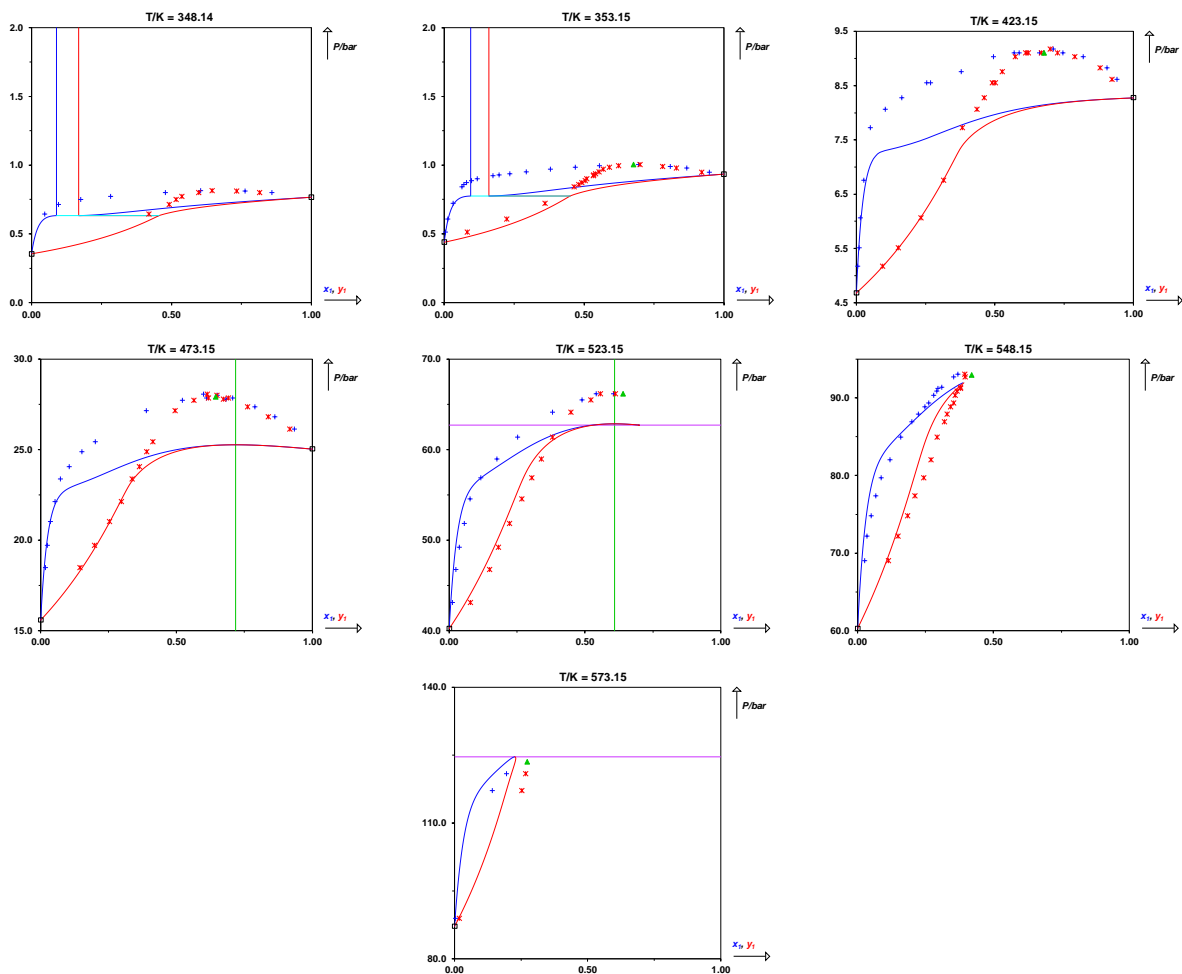
T / K	x ₁	y ₁					
322.32	0.0055	0.0600					
320.25	0.0140	0.1655					
316.59	0.0345	0.3105					

SA-SA systems (BAC = 9)

326.34	0.9090	0.8650		342.71	0.1660	0.5330	
326.73	0.9480	0.9160		342.36	0.2070	0.5400	
				342.03	0.2570	0.5490	
Wilson, Abraham - Simons, Edward L., Vapor-Liquid Equilibria. 2-Propanol - Water System, Industrial & Engineering Chemistry. 44 (1952) 2214-2219. doi:10.1021/ie50513a063				341.68	0.3170	0.5600	
P / bar = 0.5066				341.42	0.3710	0.5720	
T / K	x ₁	y ₁		341.07	0.4400	0.5900	
352.35	0.0065	0.0925		340.81	0.5120	0.6100	
343.27	0.0410	0.3905		340.64	0.5790	0.6320	
340.91	0.0605	0.4565		340.52	0.6470	0.6640	
339.40	0.0770	0.5100		340.52	0.6900	0.6900	AZEO
338.74	0.1305	0.5255		340.53	0.7260	0.7100	
338.46	0.1765	0.5365		340.60	0.7860	0.7510	
338.17	0.2620	0.5465		340.90	0.8600	0.8180	
338.13	0.2680	0.5490		341.59	0.9270	0.8940	
337.76	0.3350	0.5625		342.12	0.9740	0.9590	
337.75	0.3915	0.5700					
337.33	0.4765	0.5960		Arce, Alberto - Arce, Alberto - Martínez-Ageitos, José - Rodil, Eva - Soto, Ana, (Vapour+liquid) equilibrium of (DIPE+IPA+water) at 101.32kPa, The Journal of Chemical Thermodynamics. 35 (2003) 871-884. doi:10.1016/S0021-9614(03)00018-1			
337.10	0.5865	0.6335		P / bar = 1.013			
337.05	0.6585	0.6685		T / K	x ₁	y ₁	
337.08	0.6715	0.6740		371.95	0.0034	0.0502	
337.05	0.6750	0.6750	AZEO	370.64	0.0068	0.0976	
337.06	0.6930	0.6875		369.04	0.0108	0.1555	
337.11	0.7450	0.7200		366.79	0.0172	0.2345	
337.11	0.7565	0.7280		364.37	0.0251	0.3152	
337.14	0.7980	0.7600		358.70	0.0545	0.4565	
337.39	0.8530	0.8100		356.18	0.1114	0.5175	
337.66	0.8760	0.8630		355.00	0.2376	0.5551	
337.71	0.8865	0.8435		354.73	0.2874	0.5634	
337.79	0.8935	0.8510		354.44	0.3413	0.5716	
338.05	0.9285	0.8935		354.22	0.3791	0.5791	
				354.02	0.4231	0.5853	
Marzal, Paula - Montón, Juan B. - Rodrigo, Manuel A., Isobaric Vapor-Liquid Equilibria of the Water + 2-Propanol System at 30, 60, and 100 kPa, Journal of Chemical & Engineering Data. 41 (1996) 608-611. doi:10.1021/je9503113				353.75	0.4868	0.6020	
P / bar = 0.6000				353.52	0.5513	0.6227	
T / K	x ₁	y ₁		353.39	0.6047	0.6412	
356.98	0.0050	0.0870		353.32	0.6409	0.6619	
354.61	0.0100	0.1700		353.28	0.6713	0.6772	
353.14	0.0130	0.2240		353.28	0.6850	0.6850	AZEO
350.52	0.0250	0.3050		353.28	0.6895	0.6877	
348.62	0.0300	0.3650		353.29	0.7089	0.6994	
346.48	0.0490	0.4330		353.38	0.7631	0.7365	
345.13	0.0640	0.4670		353.49	0.8000	0.7652	
344.19	0.0790	0.4890		353.64	0.8319	0.7929	
343.63	0.1060	0.5090		353.80	0.8623	0.8210	
343.11	0.1310	0.5180		354.14	0.9037	0.8678	
				354.40	0.9313	0.9011	
				354.66	0.9545	0.9316	

SA-SA systems (BAC = 9)





2-METHYL-2-PROPANOL (1) + 1-BUTANOL (2)

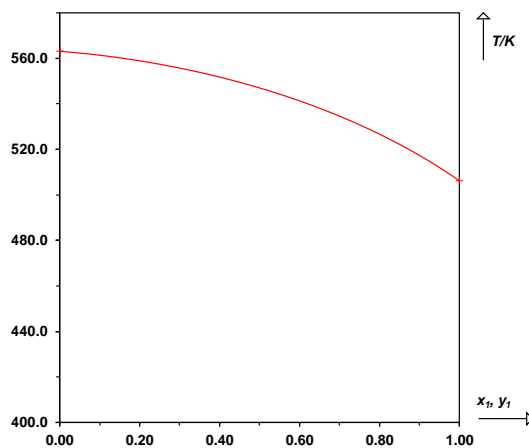
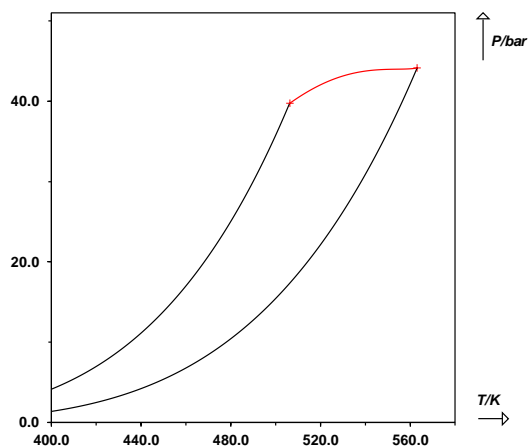
CAS	75-65-0	71-36-3
InChiKey	DKGAVHZHDRPRBM-UHFFFAOYSA-N	LRHPLDYGYMQRHN-UHFFFAOYSA-N
T_c / K	506.20	563.10
P_c / bar	39.72	44.14
ω	0.615	0.588

Ideal

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results*Parameters*

A/MPa = -43.64

B/MPa = -28.17

*Deviations*MAPE on x = 20 %MAPE on y = 19 %MAPE on h^M = 9.7 %

Isothermal phase equilibrium data

Geiseler, G. - Sühnel, K. - Quitzsch, K., Exzeßigenschaften der binären Mischsysteme aus den isomeren Butanolen, Zeitschrift für Physikalische Chemie. 2540 (1973) doi:10.1515/zpch-1973-25425

T / K = 313.15

P / bar	x ₁	y ₁
0.0273	0.0240	0.0900
0.0307	0.0620	0.2130
0.0381	0.1420	0.4210
0.0448	0.2140	0.5550
0.0530	0.2950	0.6650
0.0582	0.3470	0.7200
0.0705	0.4500	0.8070
0.0786	0.5260	0.8550
0.0854	0.5810	0.8860
0.0889	0.6110	0.8980
0.0952	0.6600	0.9220
0.0983	0.6880	0.9280
0.1111	0.7870	0.9590
0.1158	0.8170	0.9690
0.1273	0.9030	0.9860
0.1317	0.9400	0.9910

Isobaric phase equilibrium data

Quitzs, K. - Köhler, S. - Taubert, K. - Geiseler, G., Isobare Flüssigkeit-Dampf-Gleichgewichte der „quasi-idealen“ binären Systeme n-Butanol/sek.-Butanol und n-Butanol/tert.-Butanol, Journal für Praktische Chemie. 311 (1969) 429-437. doi:10.1002/prac.19693110312

P / bar = 0.1333

T / K	x ₁	y ₁
337.91	0.1000	0.3080
333.37	0.2000	0.5230
329.66	0.3000	0.6650
326.24	0.4000	0.7660
323.08	0.5000	0.8410
320.41	0.6000	0.8930
318.12	0.7000	0.9310
316.06	0.8000	0.9620
314.18	0.9000	0.9850

Quitzs, K. - Köhler, S. - Taubert, K. - Geiseler, G., Isobare Flüssigkeit-Dampf-Gleichgewichte der „quasi-idealen“ binären Systeme n-Butanol/sek.-Butanol und n-Butanol/tert.-Butanol, Journal für Praktische Chemie. 311 (1969) 429-437. doi:10.1002/prac.19693110312

P / bar = 0.4000

T / K	x ₁	y ₁
361.65	0.1000	0.2840
356.90	0.2000	0.4920
352.78	0.3000	0.6310
349.21	0.4000	0.7310
346.04	0.5000	0.8100
342.95	0.6000	0.8730
340.35	0.7000	0.9200
338.02	0.8000	0.9550
335.88	0.9000	0.9820

Quitzs, K. - Köhler, S. - Taubert, K. - Geiseler, G., Isobare Flüssigkeit-Dampf-Gleichgewichte der „quasi-idealen“ binären Systeme n-Butanol/sek.-Butanol und n-Butanol/tert.-Butanol, Journal für Praktische Chemie. 311 (1969) 429-437. doi:10.1002/prac.19693110312

P / bar = 0.6666

T / K	x ₁	y ₁
374.23	0.1000	0.2770
369.57	0.2000	0.4730
365.30	0.3000	0.6170
361.43	0.4000	0.7240
357.99	0.5000	0.8050
354.91	0.6000	0.8670
352.12	0.7000	0.9160
349.61	0.8000	0.9520
347.42	0.9000	0.9790

Quitzs, K. - Köhler, S. - Taubert, K. - Geiseler, G., Isobare Flüssigkeit-Dampf-Gleichgewichte der „quasi-idealen“ binären Systeme n-Butanol/sek.-Butanol und n-Butanol/tert.-Butanol, Journal für Praktische Chemie. 311 (1969) 429-437. doi:10.1002/prac.19693110312

P / bar = 0.9333

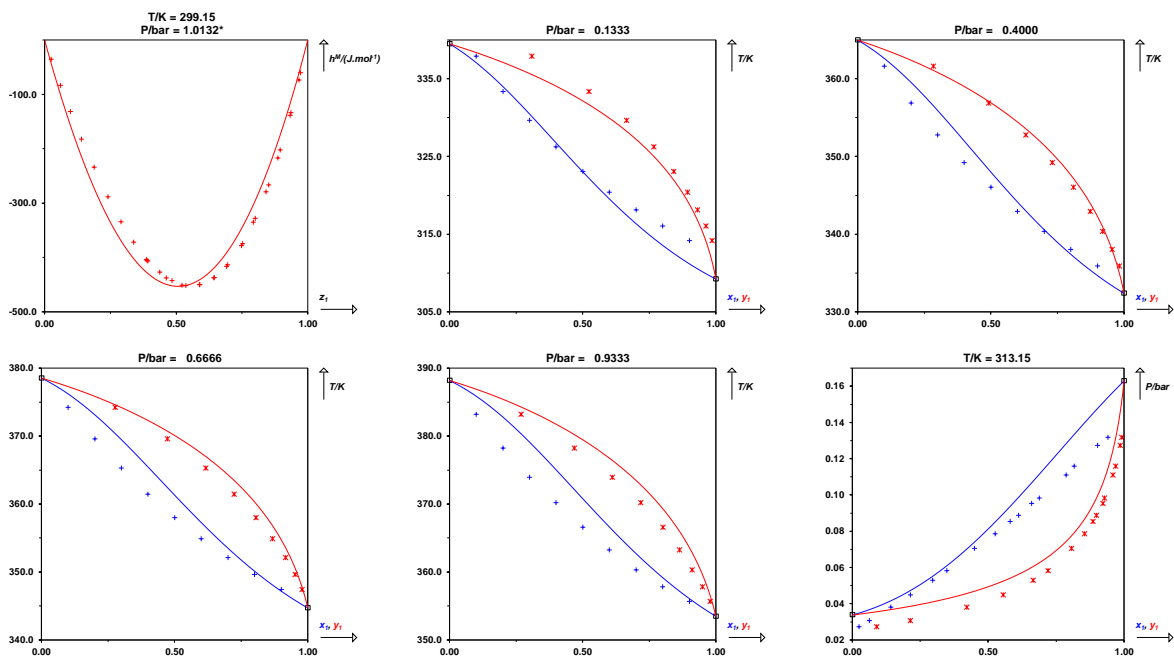
T / K	x ₁	y ₁
383.21	0.1000	0.2690
378.25	0.2000	0.4680
373.96	0.3000	0.6110
370.20	0.4000	0.7180
366.57	0.5000	0.8010
363.25	0.6000	0.8630
360.32	0.7000	0.9110
357.84	0.8000	0.9490
355.65	0.9000	0.9780

Enthalpy of mixing

Murakami, Sachio - Benson, G. C., Thermodynamic Properties of Some Isomeric Butyl Alcohol Mixtures, Bulletin of the Chemical Society of Japan. 46 (1973) 74-79. doi:10.1246/bcsj.46.74

T / K =	299.15
P / bar =	UNKNOWN (1.0132)
$h^M / \text{J.mol}^{-1}$	x_1
-35.80	0.0253
-83.50	0.0604
-131.60	0.0978
-182.70	0.1397
-233.90	0.1875
-288.80	0.2410
-334.10	0.2905
-372.10	0.3381
-403.80	0.3863
-405.60	0.3892
-406.50	0.3923
-427.20	0.4369
-437.50	0.4625
-442.70	0.4841
-450.80	0.5216
-451.40	0.5364
-449.90	0.5891
-450.50	0.5896
-437.40	0.6430
-437.00	0.6450
-416.10	0.6915
-413.20	0.6957
-378.10	0.7473
-375.00	0.7515
-335.30	0.7935
-328.00	0.8007
-279.10	0.8415
-266.50	0.8518
-217.20	0.8856
-202.30	0.8954
-138.80	0.9323
-133.90	0.9351
-74.00	0.9657
-59.90	0.9728

SA-SA systems (BAC = 9)



NITROMETHANE (1) + 1-BUTANOL (2)

CAS	75-52-5	71-36-3
InChiKey	LYGJENNIWJXYER-UHFFFAOYSA-N	LRHPLDYGYMQRHN-UHFFFAOYSA-N
T_c / K	588.15	563.10
P_c / bar	63.10	44.14
ω	0.348	0.588

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 128.7$$

$$B/\text{MPa} = 237.5$$

Deviations

$$\text{MAPE on } x = 53 \%$$

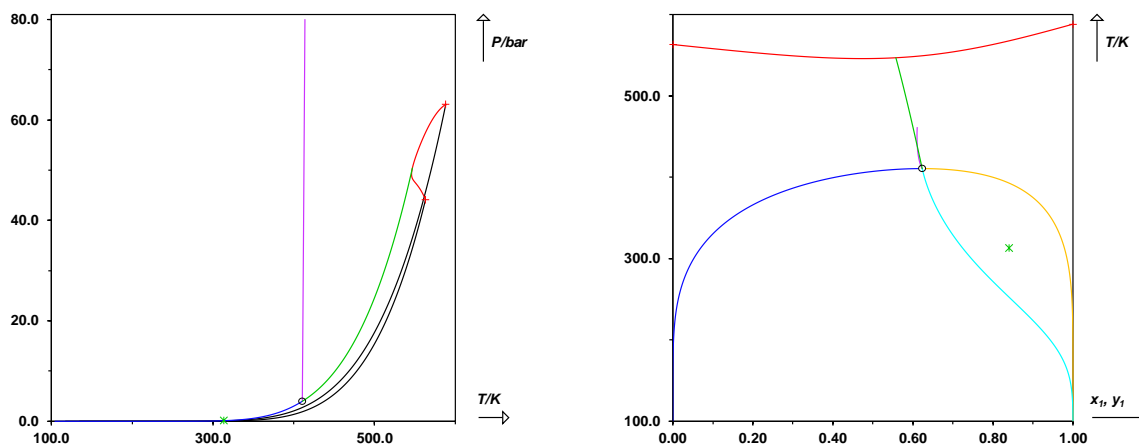
$$\text{MAPE on } y = 171 \%$$

$$\text{MAPE on } x_{\text{az}} = 27 \%$$

$$\text{MAPE on } P_{\text{az}} = 9.7 \%$$

$$\text{MAPE on } h^{\text{M}} = 62 \%$$

$$\text{MAPE on } c_p^{\text{M}} = 194 \%$$



Isothermal phase equilibrium data

Sazonov, V.P. - Filippov, V.V., Study of the thermodynamic properties of the nitromethane-butyl alcohol system, Vestn. Leningr. Univ. Ser. 4 Fiz. Khim. 2 (1977) 151-153.

T / K = 293.15		
P / bar	x ₁	y ₁
0.0080	0.0060	0.2390
0.0097	0.0120	0.3780
0.0131	0.0240	0.5420
0.0209	0.0600	0.7220
0.0288	0.1170	0.8080
0.0364	0.2330	0.8570
0.0379	0.3430	0.8670
0.0392	0.4470	0.8700
0.0395	0.5480	0.8730
0.0396	0.6360	0.8750
0.0397	0.7390	0.8760
0.0399	0.8260	0.8780
0.0400	0.9160	0.8970
0.0393	0.9580	0.9200
0.0373	0.9950	0.9830

Sazonov, V.P. - Filippov, V.V., Study of the thermodynamic properties of the nitromethane-butyl alcohol system, Vestn. Leningr. Univ. Ser. 4 Fiz. Khim. 2 (1977) 151-153.

T / K = 313.15		
P / bar	x ₁	y ₁
0.0292	0.0060	0.1500
0.0329	0.0120	0.2500
0.0393	0.0240	0.3790
0.0552	0.0600	0.5720
0.0743	0.1170	0.6960
0.0943	0.2330	0.7770
0.1015	0.3430	0.8020
0.1059	0.4470	0.8090
0.1067	0.5480	0.8160
0.1073	0.6360	0.8180
0.1077	0.7390	0.8220
0.1079	0.8260	0.8340
0.1079	0.8400	0.8400
0.1072	0.9160	0.8750
0.1056	0.9580	0.9150
0.1020	0.9950	0.9800

Isobaric phase equilibrium data

Cerdeiriña, C.A. - Tovar, C.A. - González, D. - Carballo, E. - Romani, L., Thermodynamics of the nitromethane + 1-

butanol system near the upper critical point, Fluid Phase Equilibria. 179 (2001) 101-115. doi:10.1016/S0378-3812(00)00485-4

P / bar = 1.0133		
T / K	x ₁ ^a	x ₁ ^b
284.98	-	0.8281
285.25	0.3071	-
288.97	0.4048	-
289.02	-	0.7432
289.96	-	0.6927
290.24	0.5054	-
290.3	-	0.6197
290.31	-	0.5910
290.33	0.5387	-
290.36	0.5705	-

Enthalpy of mixing

Feng, Hui - Wang, Yanru - Shi, Jun - Benson, George C. - Lu, Benjamin C.-Y., Excess enthalpies of (methyl formate or nitroethane + an n-alkane) and of (nitromethane + butan-1-ol or hexan-1-ol or ethan-1,2-diol), The Journal of Chemical Thermodynamics. 23 (1991) 169-174. doi:10.1016/S0021-9614(05)80294-0

T / K = 294.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
454.00	0.0499
996.00	0.1275
1395.0	0.2073
1620.0	0.2580
1738.0	0.3143
1885.0	0.4112
1938.0	0.4954
1930.0	0.5684
1902.0	0.6417
1842.0	0.7078
1735.0	0.7625
1404.0	0.8496
1161.0	0.8942
928.00	0.9245

Trampe, D. Mark - Eckert, Charles A., Calorimetric measurement of partial molar excess enthalpies at infinite dilution, Journal of Chemical & Engineering Data. 36 (1991) 112-118. doi:10.1021/je00001a033

T / K = 298.15	
P / bar = UNKNOWN (1.0132)	
h ^M / J.mol ⁻¹	x ₁
37.09	0.9977

33.00	0.9979
30.78	0.9981
26.97	0.9983
23.35	0.9985
19.46	0.9988
15.75	0.9990
11.67	0.9993
7.780	0.9995
3.930	0.9998

Rebelo, Luís P. N. - Najdanovic-Visak, Vesna - Visak, Zoran P. - Nunes da Ponte, M. - Troncoso, Jacobo - Cerdeiriña, Claudio A. - Romaní, Luis, Two ways of looking at Prigogine and Defay's equation, Physical Chemistry Chemical Physics. 4 (2002) 2251-2259. doi:10.1039/b200292b

T / K = 298.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

833.00	0.1021
1598.0	0.2115
2163.0	0.3575
2332.0	0.4458
2382.0	0.5102
2378.0	0.5642
2365.0	0.6176
2313.0	0.6573
2146.0	0.7262
1922.0	0.7789
967.00	0.9105

Sharma, V.K. - Singh, J., Thermodynamics of molecular interactions in binary mixtures containing nitromethane: Molar excess volumes and molar excess enthalpies, Indian J. Chem. Sect. A. 38 (1999) 65-69.

T / K = 308.15

P / bar = UNKNOWN (1.0132)

$h^M / \text{J.mol}^{-1}$ x_1

534.00	0.0681
1047.0	0.1432
1415.0	0.2054
1737.0	0.2682
2056.0	0.3432
2294.0	0.4161
2466.0	0.4973
2512.0	0.5402
2507.0	0.6181
2416.0	0.6767
2259.0	0.7302
1844.0	0.8141
1261.0	0.8902
568.00	0.9562

Heat capacity of mixing

Cerdeiriña, C.A. - Tovar, C.A. - González, D. - Carballo, E. - Romaní, L., Thermodynamics of the nitromethane + 1-butanol system near the upper critical point, Fluid Phase Equilibria. 179 (2001) 101-115. doi:10.1016/S0378-3812(00)00485-4

T / K = 288.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

3.372	0.0543
5.754	0.1027
10.51	0.2050
16.12	0.3067
18.42	0.3367
11.30	0.8281
4.683	0.8983
1.836	0.9384
0.4777	0.9688
-1.182	0.9878

Cerdeiriña, C.A. - Tovar, C.A. - González, D. - Carballo, E. - Romaní, L., Thermodynamics of the nitromethane + 1-butanol system near the upper critical point, Fluid Phase Equilibria. 179 (2001) 101-115. doi:10.1016/S0378-3812(00)00485-4

T / K = 293.15

P / bar = UNKNOWN (1.0132)

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$ x_1

3.407	0.0543
5.747	0.1027
10.26	0.2050
15.03	0.3067
16.48	0.3367
20.52	0.4063
26.02	0.5054
27.17	0.5372
27.74	0.5705
27.54	0.5910
25.52	0.6501
22.25	0.6926
17.24	0.7432
9.605	0.8281
3.983	0.8983
1.571	0.9384
0.3589	0.9688
-1.007	0.9878

Cerdeiriña, C.A. - Tovar, C.A. - González, D. - Carballo, E. - Romaní, L., Thermodynamics of the nitromethane + 1-butanol system near the upper critical point, Fluid Phase Equilibria. 179 (2001) 101-115. doi:10.1016/S0378-3812(00)00485-4

-0.5749

0.9878

T / K = 298.15**P / bar = UNKNOWN (1.0132)**

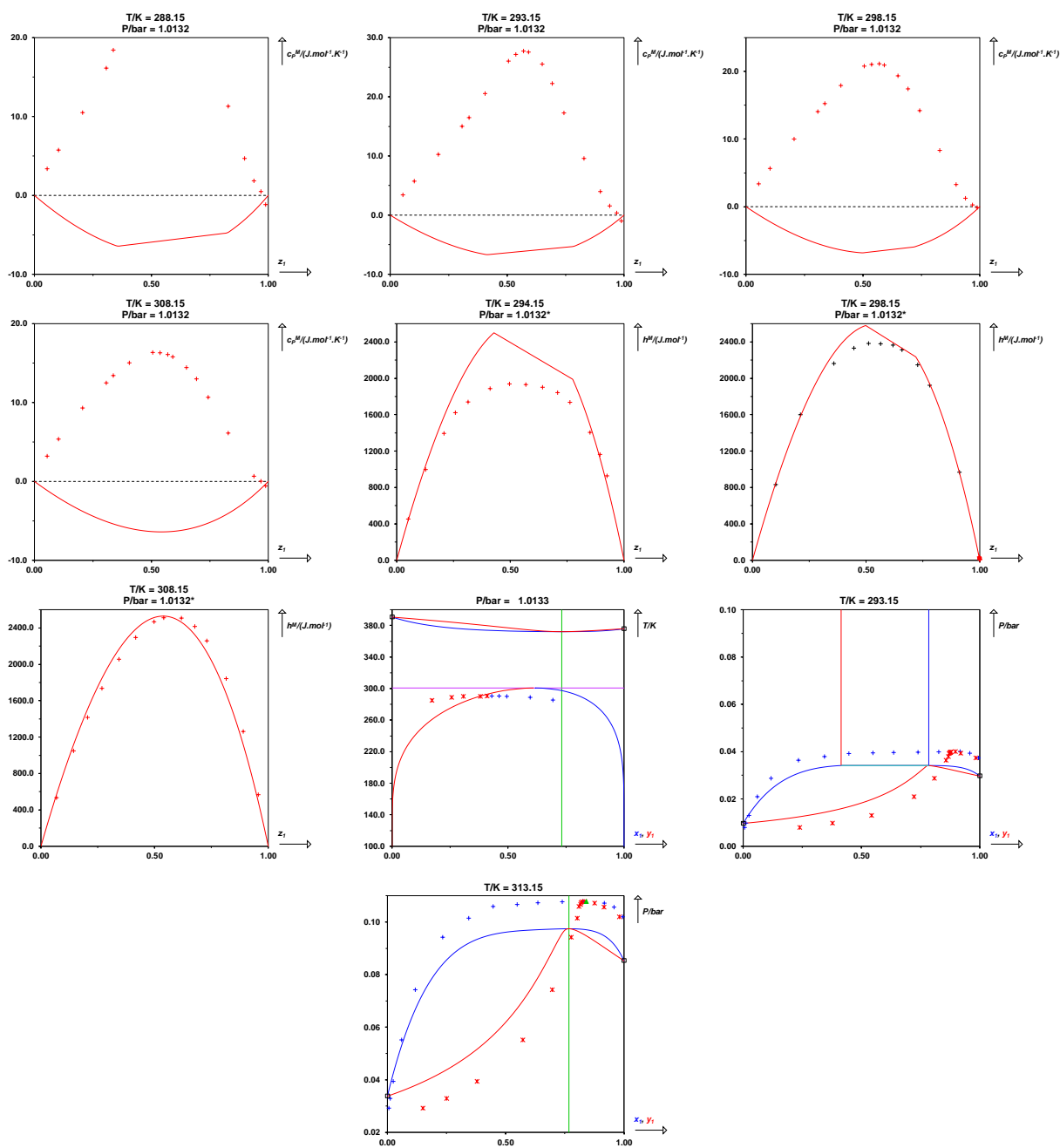
$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
3.355	0.0543
5.654	0.1027
9.987	0.2050
14.07	0.3067
15.23	0.3367
17.91	0.4063
20.79	0.5054
21.04	0.5372
21.13	0.5705
20.95	0.5910
19.34	0.6501
17.40	0.6926
14.20	0.7432
8.314	0.8281
3.279	0.8983
1.260	0.9384
0.2525	0.9688
-0.1247	0.9878

Cerdeiriña, C.A. - Tovar, C.A. - González, D. - Carballo, E. - Romaní, L., Thermodynamics of the nitromethane + 1-butanol system near the upper critical point, Fluid Phase Equilibria. 179 (2001) 101-115. doi:10.1016/S0378-3812(00)00485-4

T / K = 308.15**P / bar = UNKNOWN (1.0132)**

$c_p^M / \text{J.mol}^{-1}.\text{K}^{-1}$	x_1
3.182	0.0543
5.349	0.1027
9.293	0.2050
12.50	0.3067
13.41	0.3367
15.03	0.4063
16.33	0.5054
16.30	0.5372
16.08	0.5705
15.81	0.5910
14.42	0.6501
13.01	0.6926
10.66	0.7432
6.134	0.8281
0.6459	0.9384
0.0078	0.9688

SA-SA systems (BAC = 9)



ETHYL FORMATE (1) + WATER (2)

CAS	109-94-4	7732-18-5
InChiKey	WBJINCZRORDGAQ-UHFFFAOYSA-N	XLYOFNOQVPJJNP-UHFFFAOYSA-N
T_c / K	508.40	647.10
P_c / bar	47.40	220.64
ω	0.285	0.345

Non-ideal with enthalpic causes

Peng-Robinson EoS with classical mixing rules and temperature-dependent k_{ij} results

Parameters

$$A/\text{MPa} = 685.9$$

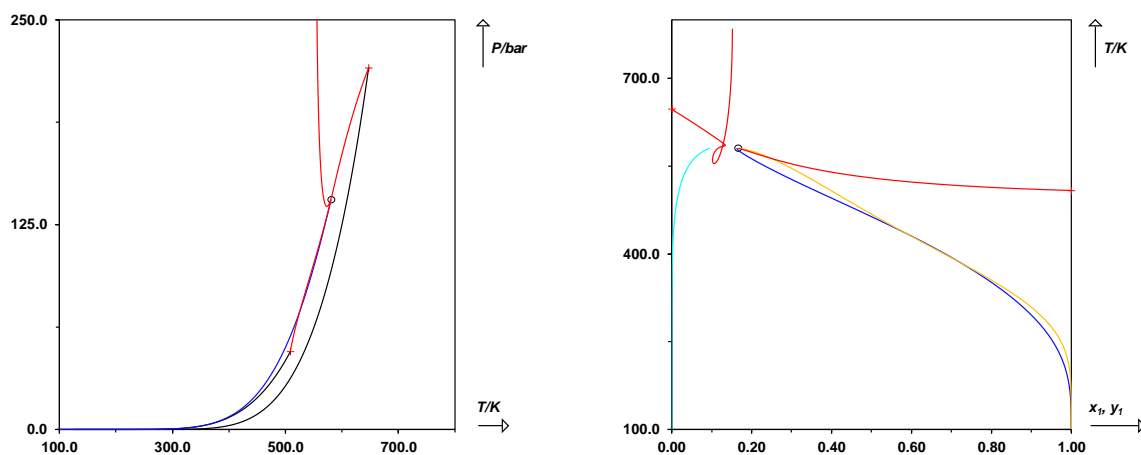
$$B/\text{MPa} = 791.5$$

Deviations

$$\text{MAPE on } x = 51 \%$$

$$\text{MAPE on } y = 12 \%$$

$$\text{MAPE on } h^M = 18 \%$$



-----			332.00	0.1080
Isothermal phase equilibrium data			404.00	0.1425
-----			519.00	0.1990
Linek, Jan - Wichterle, Ivan - Marsh, Kenneth N., Vapor-Liquid Equilibria for Water + Diacetone Alcohol, Ethyl Methanoate + Water, and Ethyl Methanoate + Phenol, Journal of Chemical & Engineering Data. 41 (1996) 1219-1222. doi:10.1021/je960183y			1396.0	0.6115
T / K = 300.00			1514.0	0.6692
P / bar	x ₁	y ₁	1651.0	0.7349
0.0789	0.0034	0.4824	1595.0	0.7713
0.1547	0.0075	0.7114	1460.0	0.8103
0.2064	0.0110	0.7947	1235.0	0.8523
0.2366	0.0143	0.8126	924.00	0.8976
0.3183	0.0209	0.8909	539.00	0.9467
0.3545	0.0230	0.9157		
0.3659	0.0245	0.9273		

Linek, Jan - Wichterle, Ivan - Marsh, Kenneth N.,
Vapor-Liquid Equilibria for Water + Diacetone Alcohol,
Ethyl Methanoate + Water, and Ethyl Methanoate +
Phenol, Journal of Chemical & Engineering Data. 41 (1996)
1219-1222. doi:10.1021/je960183y

T / K = 320.00		
P / bar	x ₁	y ₁
0.2776	0.0048	0.6965
0.3700	0.0082	0.7897
0.4704	0.0113	0.8271
0.5816	0.0147	0.8538
0.6912	0.0200	0.8705
0.6953	0.0205	0.8759
0.8102	0.0260	0.8926

----- Enthalpy of mixing -----

Wittig, Roland - Lohmann, Jürgen - Joh, Ralph -
Horstmann, Sven - Gmehling, Jürgen, Vapor-Liquid
Equilibria and Enthalpies of Mixing in a Temperature
Range from 298.15 to 413.15 K for the Further
Development of Modified UNIFAC (Dortmund), Industrial
& Engineering Chemistry Research. 40 (2001) 5831-5838.
doi:10.1021/ie010444j

T / K = 363.15	
P / bar = 16.86	
h ^M / J.mol ⁻¹	z ₁
61.00	0.0117
137.00	0.0244
191.00	0.0382
221.00	0.0532
254.00	0.0697
291.00	0.0879

SA-SA systems (BAC = 9)

