

**Table A.1**

[Table A.1.](#) Structural data of the studied Oman peridotites

Sample	Massif	Lithology	Normalized height in the section	Type	Thickness (m)	Hzb/Dun pairs	Hzb/Dun pair distance (m)
<i>Moho Transition Zone (MTZ) dunites</i>							
10 OM 25	Sumail (Maqsad)	pl-impregnated dunite	0.030		400.00		
10 OM 45C	Sumail (Maqsad)	dunite	0.030		400.00		
18 OK 26	Sumail (Maqsad)	cpx-bearing dunite	0.040		150.00		
10 OM 5C	Sumail (Mansah)	dunite	0.025		800.00		
07 OD 1	Sumail (Mansah)	dunite	0.050		800.00		
16 OL 11B	Wadi Tayin	pure dunite	0.000		30.00		
16 OL 34B	Wadi Tayin	pl/px-impregnated dunite / troctolite	0.028		20.00		
<i>Main mantle section (MMS) dunites</i>							
16 OD 4C	Nakhl-Rustaq	pl/cpx-impregnated dunite (vein)	0.07	discordant	0.15	(16 OD 4D <sub>Hzb</sub> )	(0.30)
16 OD 4D <sub>Dun</sub>	Nakhl-Rustaq	cpx-impregnated dunite (vein)	0.07	discordant	0.10	16 OD 4D <sub>Hzb</sub>	0.00
16 OD 9A	Nakhl-Rustaq	pure dunite (band)	0.09	concordant	0.38	16 OD 9C	0.10
16 OD 1B	Nakhl-Rustaq	px-bearing dunite (vein)	0.34	discordant	1.50	16 OD 1A	1.00
16 OD 31	Wadi Tayin	px-bearing dunite (band)	0.12	concordant	0.80		
<i>Basal dunites</i>							
16 OD 13B	Nakhl-Rustaq	px-bearing dunite (band)	0.64	concordant	4.00	16 OD 13C	1.00
16 OD 15E	Nakhl-Rustaq	px-bearing dunite (band)	0.93	concordant	1.00		
16 OD 18B	Sumail	opx-bearing dunite (band)	0.97	concordant	1.00		
16 OD 19A	Sumail	pure dunite (band)	0.95	concordant	1.00		
16 OL 26A	Wadi Tayin	px-bearing dunite (band)	0.72	concordant	0.20	16 OL 26B	1.00
16 OL 27A	Wadi Tayin	px-bearing dunite (band)	0.78	concordant	0.50	16 OL 27B	0.05
14 11E	Haylayn	pure dunite (band)	0.99	concordant	8.00		

For each sample, an approximate estimation of its height in the mantle section was obtained by normalizing to the total section height to compare samples from different cross-sections. For MTZ dunites, the thickness mentioned is the MTZ's one. Samples belonging to harzburgite/dunite pairs collected in close proximity (<1 meter) are indicated.

Hzb = harzburgite; Dun = dunite; Px = pyroxene; Opx = orthopyroxene; Cpx = clinopyroxene; Pl = plagioclase.

Table A.2

Table A.2. Locations and petrographic data of the studied Oman peridotites

Sample	Massif	Lithology	Hzb/Dun pairs	UTM coordinates			Normalized height in the section	T°	Texture			Modal abundances (wt.%)					
				Zone	E	N			Type	Overgrowth	Impregnations	Ol	Px	Spl	Pl		
<i>Moho Transition Zone (MTZ) peridotites</i>																	
10 OM 25	Sumail (Maqsad)	pl-impregnated dunite		40Q	601928	2550071	0.030	HT	porphyroclastic (Pl, interstitial)			PI	85.0	0.0	2.0	13.0	
10 OM 45C	Sumail (Maqsad)	pure dunite		40Q	602672	2550888	0.010	HT	granular				98.0	0.0	2.0		
18 OK 26	Sumail (Maqsad)	cpx-bearing dunite		40Q	596809	2555512	0.040	HT	porphyroclastic				>96	<1	3.0		
10 OM 5C	Sumail (Mansah)	pure dunite		40Q	632618	2572224	0.050	HT	granular			x	99.0	0.0	1.0		
07 OD 1	Sumail (Mansah)	dunite		40Q	634370	2571258	0.050	MT	porphyroclastic								
16 OL 11B	Wadi Tayin	pure dunite		40Q	646150	2534380	0.000	HT	granular			x	>99.5	0.0	<0.5		
16 OL 34B	Wadi Tayin	pl/px-impregnated dunite / troctolite		40Q	671900	2530219	0.028	HT	porphyroclastic (Pl, Px interstitial)			PI, Px	60.5	3.0	1.5	35.0	
<i>Main mantle section (MMS) peridotites</i>																	
16 OD 5C	Nakhl-Rustaq	pl-impregnated depleted harzburgite		40Q	568240	2591926	0.007	MT	porphyroclastic			PI	>90.5	7.0	1.5	<1	
16 OD 5D	Nakhl-Rustaq	harzburgite		40Q	568240	2591926	0.007	MT	porphyroclastic				89.0	10.0	1.0		
16 OD 7	Nakhl-Rustaq	harzburgite		40Q	568278	2591139	0.053	HT	porphyroclastic				91.0	8.0	1.0		
16 OD 4D <sub>Hzb</sub>	Nakhl-Rustaq	harzburgite	16 OD 4D <sub>Dun</sub>	40Q	568443	2590771	0.073	HT	porphyroclastic			Cpx	74.0	25.0	1.0		
16 OD 9C	Nakhl-Rustaq	harzburgite	16 OD 9A	40Q	568809	2590324	0.089	HT	porphyroclastic				91.0	8.0	1.0		
16 OD 2	Nakhl-Rustaq	harzburgite		40Q	567952	2588232	0.241	HT	porphyroclastic				78.0	20.0	2.0		
16 OD 1A	Nakhl-Rustaq	harzburgite	16 OD 1B	40Q	567456	2586807	0.337	HT	porphyroclastic				91.0	8.0	1.0		
16 OD 10	Nakhl-Rustaq	harzburgite		40Q	567861	2585397	0.419	HT	porphyroclastic				88.0	10.0	2.0		
11 OD 15A	Sumail	harzburgite		40Q	596947	2554971		HT	porphyroclastic								
07 OD 24	Sumail	harzburgite		40Q	597890	2545317		HT	porphyroclastic								
07 OD 27B	Sumail	harzburgite		40Q	595889	2545668		HT	porphyroclastic								
07 OD 8C	Sumail	harzburgite		40Q	632506	2563554		HT	porphyroclastic								
16 OD 4C	Nakhl-Rustaq	pl/cpx-impregnated dunite (vein)	(16 OD 4D <sub>Hzb</sub> )	40Q	568443	2590771	0.073	HT	granular (Pl, Cpx interstitial)			x	PI, Cpx	95.0	1.5	3.0	1.5
16 OD 9A	Nakhl-Rustaq	pure dunite (band)	16 OD 9C	40Q	568809	2590324	0.089	HT	granular			x	98.0	0.0	2.0		
16 OD 1B	Nakhl-Rustaq	px-bearing dunite (vein)	16 OD 1A	40Q	567456	2586807	0.337	HT	granular			x	>97	<1	2.0		
16 OD 31	Wadi Tayin	px-bearing dunite (band)		40Q	660545	2536491	0.116	HT	granular			x	>98	1.0	<1		
<i>Basal peridotites</i>																	
16 OD 13C	Nakhl-Rustaq	harzburgite	16 OD 13B	40Q	565540	2582672	0.637	HT	porphyroclastic				89.5	8.0	2.5		
16 OL 25	Wadi Tayin	harzburgite		40Q	648400	2554406	0.724	BT(-MT)	porphyroclastic				89.0	8.0	3.0		
16 OL 26B	Wadi Tayin	harzburgite	16 OL 26A	40Q	648515	2554316	0.724	BT(-MT)	porphyroclastic				91.5	7.0	1.5		
16 OL 27B	Wadi Tayin	harzburgite	16 OL 27A	40Q	648926	2555669	0.784	HT	porphyroclastic				83.0	15.0	2.0		
16 OL 27C	Wadi Tayin	harzburgite		40Q	648926	2555669	0.784	HT	porphyroclastic				90.0	8.0	2.0		
16 OL 28B	Wadi Tayin	cpx-bearing harzburgite		40Q	648998	2557907	0.860	HT	porphyroclastic				88.5	10.0	1.5		
16 OL 29	Wadi Tayin	cpx-bearing depleted harzburgite		40Q	649400	2558225	0.872	BT	porphyroclastic				93.0	4.0	3.0		
16 OL 24	Wadi Tayin	harzburgite		40Q	650233	2558267	0.878	BT	porphyroclastic				90.0	8.0	2.0		
16 OD 13B	Nakhl-Rustaq	px-bearing dunite (band)	16 OD 13C	40Q	565540	2582672	0.637	HT	porphyroclastic				>96	<1	3.0		
16 OD 15E	Nakhl-Rustaq	px-bearing dunite (band)		40Q	562332	2579470	0.934	(MT-?)HT	porphyroclastic				97.5	1.0	1.5		
16 OD 18B	Sumail	opx-bearing dunite (band)		40Q	601690	2580630	0.969	(MT-?)HT	porphyroclastic			x	96.5	1.0	2.5		
16 OD 19A	Sumail	pure dunite (band)		40Q	602033	2580178	0.946	MT	porphyroclastic				98.0	0.0	2.0		
16 OL 26A	Wadi Tayin	px-bearing dunite (band)	16 OL 26B	40Q	648515	2554316	0.724	BT-MT	porphyroclastic				96.0	1.0	3.0		
16 OL 27A	Wadi Tayin	px-bearing dunite (band)	16 OL 27B	40Q	648926	2555669	0.784	HT	granular			x	96.0	1.5	2.5		
14 11E	Haylayn	pure dunite (band)		40Q	493053	2616870	0.990	HT	porphyroclastic				98.0	0.0	2.0		

Samples belonging to harzburgite/dunite pairs collected in close proximity (<1 meter) are indicated. For each sample, an approximate estimation of its height in the mantle section was obtained by normalizing to the total section height to compare samples from different cross-sections.

Hzb = harzburgite; Dun = dunite; Ol = olivine; Px = pyroxene; Opx = orthopyroxene; Cpx = clinopyroxene; Spl = spinel; Pl = plagioclase; HT = high temperature (coarse-grained, asthenospheric deformation); MT = medium temperature; LT = low temperature.

Table A.2

Table A.2. Locations and petrographic data of the studied Oman peridotites (suite)

Sample	Grain size									Serpentinization	Observations	
	Ol			Px			Spl					Pl
	< 1mm	1-3 mm	> 3 mm	< 1mm	1-3 mm	> 3 mm	< 0.5mm	0.5-1 mm	> 1 mm			
<i>Moho Transition Zone (MTZ) peridotites</i>												
10 OM 25												
10 OM 45C												
18 OK 26	minor	main	minor	main	few	-	main	minor	-		high	bastite
10 OM 5C												
07 OD 1												
16 OL 11B	-	few	main	-	-	-	main	-	-		high	alteration
16 OL 34B	-	main	-	minor	main	minor	main	few	-		high	alteration
<i>Main mantle section (MMS) peridotites</i>												
16 OD 5C	few	main	minor	main	minor	few	main	minor	minor	<2 mm	middle	bastite
16 OD 5D	few	main	minor	main	minor	few	main	rare	-		high	bastite
16 OD 7	minor	minor	main	minor	main	few	main	-	minor		middle	bastite
16 OD 4D <sub>Hzb</sub>	few	main	-	minor	main	main	main	minor	-		middle	bastite
16 OD 9C	minor	main	minor	main	main	few	main	few	few		middle	bastite
16 OD 2	minor	main	-	main	minor	rare	main	minor	rare		middle-high	bastite
16 OD 1A	minor	minor	main	minor	main	main	main	rare	-		high	bastite
16 OD 10	minor	main	minor	main	minor	rare	main	few	-		middle	
11 OD 15A												
07 OD 24												
07 OD 27B												
07 OD 8C												
16 OD 4C	rare	minor	main	main	main	minor	main	minor	few	<4 mm	middle	
16 OD 9A	few	minor	main	-	-	-	main	minor	-		middle	
16 OD 1B	few	main	main	main	-	-	main	rare	rare		middle	
16 OD 31	few	few	main	main	minor	few	main	minor	-		middle	bastite
<i>Basal peridotites</i>												
16 OD 13C	minor	main	minor	minor	main	minor	main	minor	-		very high	bastite
16 OL 25	main	minor	few	main	main	-	main	minor	rare		high	bastite, high alteration
16 OL 26B	rare	main	minor	minor	main	few	main	minor	-		middle	bastite, high alteration
16 OL 27B	minor	main	main	main	main	few	minor	main	-		high	bastite
16 OL 27C	minor	main	main	main	minor	rare	main	minor	-		high	bastite
16 OL 28B	few	main	main	minor	main	few	minor	main	minor		high	bastite
16 OL 29	main	minor	-	main	few	rare	minor	main	few		very high	bastite
16 OL 24	minor	main	minor	main	main	minor	few	main	-		very high	bastite
16 OD 13B	few	minor	main	main	minor	-	minor	main	-		middle-high	
16 OD 15E	minor	main	minor	main	-	-	main	-	-		very high	bastite, high alteration
16 OD 18B	few	minor	main	?	main	-	main	minor	-		high-very high	bastite
16 OD 19A	minor	main	-	-	-	-	main	minor	minor		middle-high	
16 OL 26A	minor	minor	main	main	-	-	main	-	-		middle-high	bastite, high alteration
16 OL 27A	few	main	main	main	-	-	rare	main	main		middle-high	bastite, high alteration
14 11E	few	main	minor	-	-	-	main	rare	-		middle	

Samples belonging to harzburgite/dunite pairs collected in close proximity (<1 meter) are indicated. For each sample, an approximate estimation of its height in the mantle section was obtained by normalizing to the total section height to compare samples from different cross-sections.

Hzb = harzburgite; Dun = dunite; Ol = olivine; Px = pyroxene; Opx = orthopyroxene; Cpx = clinopyroxene; Spl = spinel; Pl = plagioclase; HT = high temperature (coarse-grained, asthenospheric deformation); MT = medium temperature; LT = low temperature.

Table A.3

Table A.3. Locations and major element compositions of the studied Oman peridotites

Sample	Massif	Lithology	Hzb/Dun pairs	UTM coordinates		Normalized height in the section	SiO <sub>2</sub> (wt.%)	Al <sub>2</sub> O <sub>3</sub>	FeO*	MnO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	TiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	LOI	Total	Mg#	
				Zone	E															N
<i>Moho Transition Zone (MTZ) peridotites</i>																				
10 OM 25	Sumail (Maqsad)	pl-impregnated dunite	40Q	601928	2550071	0.030	36.97	1.71	8.65	0.14	42.41	1.30	0.1	0.0	0.04	b.d.l.	8.12	99.43	0.897	
10 OM 45C	Sumail (Maqsad)	pure dunite	40Q	602672	2550888	0.030	35.86	0.76	8.84	0.14	44.42	0.21	0.01	b.d.l.	0.04	b.d.l.	8.27	98.55	0.900	
18 OK 26	Sumail (Maqsad)	cpx-bearing dunite	40Q	596809	2555512	0.040	34.87	0.48	6.71	0.11	43.17	0.06	b.d.l.	b.d.l.	0.02	b.d.l.	12.94	98.36	0.920	
10 OM 5C	Sumail (Mansah)	pure dunite	40Q	632618	2572224	0.025	35.57	0.47	7.95	0.12	43.97	0.14	b.d.l.	b.d.l.	0.01	b.d.l.	10.71	98.94	0.908	
07 OD 1	Sumail (Mansah)	dunite	40Q	634370	2571258	0.050	36.04	0.81	8.64	0.13	43.52	0.19	b.d.l.	b.d.l.	0.01	0.07	9.29	98.70	0.900	
16 OL 11B	Wadi Tayin	pure dunite	40Q	646150	2534380	0.000	34.90	0.09	8.20	0.12	42.65	0.12	b.d.l.	b.d.l.	b.d.l.	0.10	12.26	98.44	0.903	
16 OL 34B	Wadi Tayin	pl/px-impregnated dunite / troctolite	40Q	671900	2530219	0.028	34.08	8.23	5.77	0.09	28.67	10.47	b.d.l.	b.d.l.	b.d.l.	b.d.l.	11.16	98.45	0.899	
<i>Main mantle section (MMS) peridotites</i>																				
16 OD 5C	Nakhl-Rustaq	pl-impregnated depleted harzburgite	40Q	568240	2591926	0.007	35.60	0.48	8.76	0.14	39.86	0.57	b.d.l.	b.d.l.	0.02	b.d.l.	13.23	98.66	0.890	
16 OD 5D	Nakhl-Rustaq	harzburgite	40Q	568240	2591926	0.007	40.59	0.94	6.51	0.11	39.96	0.59	b.d.l.	b.d.l.	b.d.l.	b.d.l.	10.15	98.85	0.916	
16 OD 7	Nakhl-Rustaq	harzburgite	40Q	568278	2591139	0.053	40.48	0.68	7.23	0.12	40.47	0.71	b.d.l.	b.d.l.	b.d.l.	b.d.l.	8.93	98.62	0.909	
16 OD 4D <sub>Hzb</sub>	Nakhl-Rustaq	harzburgite	40Q	568443	2590771	0.073	39.94	0.60	8.06	0.14	40.85	0.92	b.d.l.	b.d.l.	0.03	b.d.l.	8.44	98.96	0.900	
16 OD 9C	Nakhl-Rustaq	harzburgite	40Q	568809	2590324	0.089	40.12	0.59	7.32	0.12	40.64	0.80	b.d.l.	b.d.l.	b.d.l.	b.d.l.	8.80	98.39	0.908	
16 OD 2	Nakhl-Rustaq	harzburgite	40Q	567952	2588232	0.241	41.65	0.86	7.30	0.12	39.83	1.20	b.d.l.	b.d.l.	b.d.l.	b.d.l.	7.46	98.42	0.907	
16 OD 1A	Nakhl-Rustaq	harzburgite	40Q	567456	2586807	0.337	38.96	0.68	7.55	0.11	40.63	0.56	b.d.l.	b.d.l.	b.d.l.	b.d.l.	10.07	98.56	0.906	
16 OD 10	Nakhl-Rustaq	harzburgite	40Q	567861	2585397	0.419	40.29	0.96	7.32	0.12	39.43	1.66	b.d.l.	b.d.l.	b.d.l.	b.d.l.	8.47	98.25	0.906	
11 OD 15A	Sumail	harzburgite	40Q	596947	2554971	0.280	40.34	0.75	7.19	0.11	41.66	0.53	b.d.l.	b.d.l.	b.d.l.	b.d.l.	8.40	99.78	0.912	
07 OD 24	Sumail	harzburgite	40Q	597890	2545317	0.254	42.09	0.72	7.70	0.12	41.98	0.86	b.d.l.	b.d.l.	0.00	0.06	5.59	99.12	0.907	
07 OD 27B	Sumail	harzburgite	40Q	595889	2545668	0.344	40.38	0.64	7.74	0.12	40.96	1.08	0.01	0.01	0.02	b.d.l.	8.91	99.87	0.904	
07 OD 8C	Sumail	harzburgite	40Q	632506	2563554	0.150	41.37	0.84	7.36	0.12	41.90	0.93	b.d.l.	b.d.l.	0.01	0.05	6.58	99.14	0.910	
16 OD 4C	Nakhl-Rustaq	pl/cpx-impregnated dunite (vein)	40Q	568443	2590771	0.073	35.53	0.96	8.86	0.13	41.43	0.41	b.d.l.	b.d.l.	0.02	b.d.l.	10.59	97.93	0.893	
16 OD 4D <sub>Dun</sub>	Nakhl-Rustaq	cpx-impregnated dunite (vein)	40Q	568443	2590771	0.073	37.01	0.36	8.40	0.13	41.99	0.74	b.d.l.	b.d.l.	b.d.l.	b.d.l.	9.97	98.61	0.899	
16 OD 9A	Nakhl-Rustaq	pure dunite (band)	40Q	568809	2590324	0.089	35.54	0.33	8.03	0.12	43.08	0.15	b.d.l.	b.d.l.	b.d.l.	b.d.l.	11.26	98.51	0.905	
16 OD 1B	Nakhl-Rustaq	px-bearing dunite (vein)	40Q	567456	2586807	0.337	35.93	0.51	8.37	0.13	44.29	0.25	b.d.l.	b.d.l.	b.d.l.	b.d.l.	9.98	99.46	0.904	
16 OD 31	Wadi Tayin	px-bearing dunite (band)	40Q	660545	2536491	0.116	36.53	0.11	8.01	0.12	44.59	0.20	b.d.l.	b.d.l.	b.d.l.	b.d.l.	8.85	98.40	0.908	
<i>Basal peridotites</i>																				
16 OD 13C	Nakhl-Rustaq	harzburgite	40Q	565540	2582672	0.637	39.67	0.39	7.43	0.12	41.59	0.60	b.d.l.	b.d.l.	b.d.l.	b.d.l.	9.43	99.22	0.909	
16 OL 25	Wadi Tayin	harzburgite	40Q	648400	2554406	0.724	39.47	0.46	7.61	0.12	40.52	0.52	b.d.l.	b.d.l.	b.d.l.	b.d.l.	10.24	98.94	0.905	
16 OL 26B	Wadi Tayin	harzburgite	40Q	648515	2554316	0.724	36.47	0.44	7.22	0.11	41.16	0.46	b.d.l.	b.d.l.	b.d.l.	b.d.l.	13.06	98.92	0.910	
16 OL 27B	Wadi Tayin	harzburgite	40Q	648926	2555669	0.784	38.87	0.92	6.99	0.11	39.52	1.33	b.d.l.	b.d.l.	b.d.l.	b.d.l.	11.24	98.99	0.910	
16 OL 27C	Wadi Tayin	harzburgite	40Q	648926	2555669	0.784	37.91	0.63	6.97	0.11	41.29	0.55	b.d.l.	b.d.l.	b.d.l.	b.d.l.	11.85	99.31	0.913	
16 OL 28B	Wadi Tayin	cpx-bearing harzburgite	40Q	648998	2557907	0.860	37.82	0.40	7.43	0.12	41.90	0.50	b.d.l.	b.d.l.	b.d.l.	b.d.l.	11.40	99.57	0.909	
16 OL 29	Wadi Tayin	cpx-bearing depleted harzburgite	40Q	649400	2558225	0.872	40.68	1.21	7.58	0.12	40.80	0.99	b.d.l.	b.d.l.	b.d.l.	b.d.l.	7.58	98.96	0.906	
16 OL 24	Wadi Tayin	harzburgite	40Q	650233	2558267	0.878	39.17	0.56	7.01	0.11	41.23	0.51	b.d.l.	b.d.l.	b.d.l.	b.d.l.	9.59	98.18	0.913	
16 OD 13B	Nakhl-Rustaq	px-bearing dunite (band)	40Q	565540	2582672	0.637	35.62	0.16	6.64	0.10	44.89	0.07	b.d.l.	b.d.l.	b.d.l.	b.d.l.	0.1	10.76	98.35	0.923
16 OD 15E	Nakhl-Rustaq	px-bearing dunite (band)	40Q	562332	2579470	0.934	34.53	0.09	7.46	0.11	42.81	0.11	b.d.l.	b.d.l.	b.d.l.	b.d.l.	13.17	98.28	0.911	
16 OD 18B	Sumail	opx-bearing dunite (band)	40Q	601690	2580630	0.969	37.35	0.19	7.46	0.11	41.38	0.39	b.d.l.	b.d.l.	b.d.l.	b.d.l.	12.19	99.08	0.908	
16 OD 19A	Sumail	pure dunite (band)	40Q	602033	2580178	0.946	35.33	0.04	7.74	0.12	43.74	0.07	b.d.l.	b.d.l.	b.d.l.	0.11	11.31	98.46	0.910	
16 OL 26A	Wadi Tayin	px-bearing dunite (band)	40Q	648515	2554316	0.724	35.06	0.38	7.36	0.11	41.05	0.42	b.d.l.	b.d.l.	b.d.l.	b.d.l.	13.97	98.34	0.909	
16 OL 27A	Wadi Tayin	px-bearing dunite (band)	40Q	648926	2555669	0.784	34.00	0.22	7.24	0.11	41.95	0.24	b.d.l.	b.d.l.	b.d.l.	b.d.l.	15.42	99.17	0.912	
14 11E	Haylayn	pure dunite (band)	40Q	493053	2616870	0.990	36.18	b.d.l.	6.84	0.10	45.13	0.04	b.d.l.	b.d.l.	b.d.l.	b.d.l.	10.22	99.27	0.922	

Major element compositions in whole rock were analyzed by the SARM at the CRPG laboratory in Nancy (France) using ICP-OES iCap6500 with an error <0.01% and an uncertainty <5% for all elements. Samples belonging to harzburgite/dunite pairs collected in close proximity (<1 meter) are indicated. For each sample, an approximate estimation of its height in the mantle section was obtained by normalizing to the total section height to compare samples from different cross-sections.

\*Total Fe given as FeO.

Mg# = Mg/(Mg+Fe)at; LOI = Loss On Ignition; b.d.l. = below the detection limit; Hzb = harzburgite; Dun = dunite; Px = pyroxene; Opx = orthopyroxene; Cpx = clinopyroxene; Pl = plagioclase.

**Table A.4**

[Table A.4](#). Ba, Rb, Cs, Th and U concentrations of the studied Oman peridotites

Sample	Massif	Lithology	Hzb/Dun pairs	Normalized height in the section	Period	Rb (ppb)	Cs	Ba	Th	U	Th/U
<i>Moho Transition Zone (MTZ) peridotites</i>											
10 OM 25	Sumail (Maqsad)	pl-impregnated dunite		0.030	2	14.3	3.1	342	1.15	19.03	0.06
10 OM 45C	Sumail (Maqsad)	pure dunite		0.030	2	19.2	n.d.	94	0.75	2.21	0.34
18 OK 26	Sumail (Maqsad)	cpx-bearing dunite		0.040	1	65.2	8.5	166	5.02	2.86	1.76
07 OD 1	Sumail (Mansah)	dunite		0.050	2	47.4	12.5	63	1.64	1.17	1.40
16 OL 11B	Wadi Tayin	pure dunite		0.000	1	4.1	1.5	125	0.55	1.71	0.32
17 OL 11B-d					2	6.0	1.3	125	0.40	0.58	0.69
16 OL 34B	Wadi Tayin	pl/px-impregnated dunite / troctolite		0.028	1	20.8	12.0	745	2.17	4.96	0.44
<i>Main mantle section (MMS) peridotites</i>											
16 OD 5C	Nakhl-Rustaq	pl-impregnated depleted harzburgite		0.007	1	22.5	1.3	226	0.92	7.10	0.13
16 OD 5D	Nakhl-Rustaq	harzburgite		0.007	1	17.3	1.4	89	22.80	20.44	1.12
16 OD 7	Nakhl-Rustaq	harzburgite		0.053	1	9.8	2.2	307	1.17	6.45	0.18
16 OD 4D <sub>Hzb</sub>	Nakhl-Rustaq	harzburgite	16 OD 4D <sub>Dun</sub>	0.073	1	7.8	1.3	159	0.61	1.14	0.54
16 OD 9C	Nakhl-Rustaq	harzburgite	16 OD 9A	0.089	1	14.2	6.5	88	1.56	10.58	0.15
16 OD 2	Nakhl-Rustaq	harzburgite		0.241	1	31.8	2.8	425	4.23	19.13	0.22
16 OD 1A	Nakhl-Rustaq	harzburgite	16 OD 1B	0.337	1	12.1	3.7	249	0.78	1.07	0.73
16 OD 10	Nakhl-Rustaq	harzburgite		0.419	1	16.0	1.6	137	5.23	5.97	0.87
11 OD 15A	Sumail	harzburgite		0.280	2	19.3	7.1	135	1.38	3.92	0.35
07 OD 24	Sumail	harzburgite		0.254	2	16.6	20.4	428	0.82	0.51	1.59
07 OD 27B	Sumail	harzburgite		0.344	2	6.7	0.6	444	1.12	23.23	0.05
16 OD 4C	Nakhl-Rustaq	pl/cpx-impregnated dunite (vein)	(16 OD 4D <sub>Hzb</sub> )	0.073	1	4.9	1.8	439	0.78	18.27	0.04
16 OD 4D <sub>Dun</sub>	Nakhl-Rustaq	cpx-impregnated dunite (vein)	16 OD 4D <sub>Hzb</sub>	0.073	1	n.d.	n.d.	152	n.d.	1.52	-
16 OD 9A	Nakhl-Rustaq	pure dunite (band)	16 OD 9C	0.089	1	27.0	2.2	98	3.32	8.02	0.41
16 OD 1B	Nakhl-Rustaq	px-bearing dunite (vein)	16 OD 1A	0.337	1	n.d.	0.7	83	n.d.	2.39	-
16 OD 1B-d					2	5.2	0.9	85	0.31	0.86	0.36
16 OD 31	Wadi Tayin	px-bearing dunite (band)		0.116	2	6.0	4.9	n.d.	0.34	1.06	0.32
<i>Basal peridotites</i>											
16 OD 13C	Nakhl-Rustaq	harzburgite	16 OD 13B	0.637	1	14.9	2.1	611	0.48	0.78	0.62
16 OL 25	Wadi Tayin	harzburgite		0.724	1	34.7	18.2	115	0.59	0.75	0.78
16 OL 26B	Wadi Tayin	harzburgite	16 OL 26A	0.724	1	9.8	3.9	53	0.45	0.89	0.50
16 OL 27B	Wadi Tayin	harzburgite	16 OL 27A	0.784	1	14.2	4.8	78	0.35	0.79	0.45
16 OL 27C	Wadi Tayin	harzburgite		0.784	1	11.5	4.5	30	0.36	0.77	0.47
16 OL 28B	Wadi Tayin	cpx-bearing harzburgite		0.860	1	13.0	13.2	52	0.61	0.67	0.91
16 OL 29	Wadi Tayin	cpx-bearing depleted harzburgite		0.872	1	37.7	9.8	149	0.66	1.55	0.42
16 OL 24	Wadi Tayin	harzburgite		0.878	1	9.5	1.3	170	0.60	0.94	0.64
16 OD 13B	Nakhl-Rustaq	px-bearing dunite (band)	16 OD 13C	0.637	1	5.0	n.d.	53	n.d.	1.62	-
16 OD 15E	Nakhl-Rustaq	px-bearing dunite (band)		0.934	1	4.2	1.5	50	0.78	2.94	0.27
16 OD 18B	Sumail	opx-bearing dunite (band)		0.969	1	18.5	1.0	1446	0.43	1.17	0.36
16 OD 19A	Sumail	pure dunite (band)		0.946	1	n.d.	n.d.	n.d.	0.28	0.62	0.45
16 OL 26A	Wadi Tayin	px-bearing dunite (band)	16 OL 26B	0.724	1	10.9	3.5	54	0.67	0.84	0.80
16 OL 27A	Wadi Tayin	px-bearing dunite (band)	16 OL 27B	0.784	1	8.4	3.9	111	1.03	0.84	1.23

Trace element compositions in whole rock were analyzed at Géosciences Montpellier (AETE-ISO, OSU OREME, Université de Montpellier, France) using an Agilent 7700x quadrupole ICP-MS. The analytical method is given in the [Supplementary Material](#).

Samples belonging to harzburgite/dunite pairs collected in close proximity (<1 meter) are indicated.

For each sample, an approximate estimation of its height in the mantle section was obtained by normalizing to the total section height to compare samples from different cross-sections.

n.d. = not determined; Hzb = harzburgite; Dun = dunite; Px = pyroxene; Opx = orthopyroxene; Cpx = clinopyroxene; Pl = plagioclase.

## Table A.5

**Table A.5.** ICP-MS analytical parameters and Ba, Rb, Cs, Th and U concentrations of the standards

Element	Mass	DL	Blank		DTS-2b				JP-1				UB-N			
			Avg		Avg	$\sigma$	Avg	$\sigma$	Avg	$\sigma$	Avg	$\sigma$	Avg	$\sigma$	Avg	$\sigma$
<i>Analytical period</i>			1	2	1		2		1		2		2		2	
<i>Number of analyses</i>			9	3	6		1		6		2		6		2	
<i>Unity</i>		$10^{-12}$ g/g	$10^{-9}$ g/g		$10^{-9}$ g/g				$10^{-9}$ g/g				$10^{-9}$ g/g			
Rb	85	0.59	4.22	4.86	24.0	4.1	31.7	3.6	294	6.9	279.6	13.5	3063	65	3141	33
Cs	133	0.19	0.11	0.50	1.2	0.11	1.3	0.21	41	1.3	37.3	1.9	11007	319	11344	80
Ba	137	4.29	43.8	97.0	9980	335	10942	129	10019	194	10086	128	22117	3237	27024	304
Th	232	0.16	0.21	0.39	3.25	0.12	3.15	0.19	11.9	0.23	12.32	0.41	50.4	1.01	55.5	2.02
U	238	0.06	0.13	0.38	3.03	0.41	2.19	0.04	14.3	0.76	13.97	0.17	53.1	3.62	58.5	1.82

Trace element compositions were analyzed at Géosciences Montpellier (Université de Montpellier, France) using an Agilent 7700x quadrupole ICP-MS. The analytical method is given in the [Supplementary Material](#).

Mass = mass used for ICP-MS analyses; DL = detection limit of the ICP-MS; Blank = procedural blank; Avg = average;  $\sigma$  = standard deviation; n.d. = not determined.



Table A.7

Table A.7. Re and Os concentrations and Os isotope compositions of the harzburgite/dunite pairs

Sample	Massif	Lithology	Hzb/Dun pairs	Normalized height in the section	Mass (g)	[Os] (ppb)	2 $\sigma$ error	[Re] (ppb)	2 $\sigma$ error	<sup>188</sup> Os (M/g)	2 $\sigma$ error	<sup>187</sup> Re/ <sup>188</sup> Os	2 $\sigma$ error	( <sup>187</sup> Os/ <sup>188</sup> Os) <sub>m</sub>	2 $\sigma$ error	( <sup>187</sup> Os/ <sup>188</sup> Os) <sub>95 Ma</sub>	2 $\sigma$ error	T <sub>RD</sub> age (Ga)
<i>Main mantle section (MMS) peridotites</i>																		
16 OD 4D <sub>Hzb</sub>	Nakhl-Rustaq	harzburgite	16 OD 4D <sub>Dun</sub>	0.073	1.61671	5.519	0.007	0.358	0.054	3.86E-12	5.01E-14	0.312	0.047	0.11741	0.00053	0.11691	0.00054	1.7
16 OD 4D <sub>Dun</sub>	Nakhl-Rustaq	cpx-impregnated dunite (vein)	16 OD 4D <sub>Hzb</sub>	0.073	1.53878	5.954	0.007	0.414	0.056	4.15E-12	2.08E-14	0.335	0.046	0.1273	0.0005	0.1268	0.0005	0.3
16 OD 4C	Nakhl-Rustaq	pl/cpx-impregnated dunite (vein)	(16 OD 4D <sub>Hzb</sub> )	0.073	1.56818	1.120	0.007	0.305	0.055	7.81E-13	4.92E-15	1.312	0.239	0.13474	0.00099	0.13267	0.00106	-0.7
16 OD 9C	Nakhl-Rustaq	harzburgite	16 OD 9A	0.089	2.03326	3.691	0.003	0.130	0.009	2.57E-12	2.33E-14	0.170	0.012	0.1287	0.0013	0.1284	0.0013	0.1
16 OD 9A	Nakhl-Rustaq	pure dunite (band)	16 OD 9C	0.089	2.04511	11.802	0.003	0.431	0.009	8.21E-12	6.48E-14	0.177	0.004	0.1486	0.0006	0.1483	0.0006	
16 OD 1A	Nakhl-Rustaq	harzburgite	16 OD 1B	0.337	1.72667	4.164	0.006	0.599	0.050	2.91E-12	2.05E-14	0.693	0.058	0.1235	0.0006	0.1224	0.0006	0.8
16 OD 1B	Nakhl-Rustaq	px-bearing dunite (vein)	16 OD 1A	0.337	2.02651	3.145	0.005	0.087	0.043	2.19E-12	9.82E-15	0.134	0.066	0.1332	0.0006	0.1330	0.0006	-0.5
16 OD 1B-d					2.01184	4.353	0.005	0.094	0.043	3.04E-12	1.15E-14	0.104	0.048	0.1314	0.0006	0.1312	0.0006	-0.2
<i>Basal peridotites</i>																		
16 OD 13C	Nakhl-Rustaq	harzburgite	16 OD 13B	0.637	2.01014	4.415	0.005	0.415	0.043	3.08E-12	1.17E-14	0.453	0.047	0.12607	0.00054	0.12536	0.00054	0.5
16 OD 13C-d					2.01725	4.076	0.005	0.379	0.043	2.84E-12	2.00E-14	0.448	0.051	0.1265	0.0006	0.1258	0.0006	0.4
16 OD 13B	Nakhl-Rustaq	px-bearing dunite (band)	16 OD 13C	0.637	1.57217	7.169	0.007	0.158	0.055	5.01E-12	3.04E-14	0.106	0.037	0.1216	0.0005	0.1214	0.0005	1.1
16 OL 26B	Wadi Tayin	harzburgite	16 OL 26A	0.724	2.01238	3.214	0.003	0.022	0.032	2.24E-12	8.84E-15	0.032	0.048	0.1215	0.0015	0.1215	0.0015	1.1
16 OL 26A	Wadi Tayin	px-bearing dunite (band)	16 OL 26B	0.724	2.01473	4.460	0.003	0.014	0.029	3.11E-12	1.86E-14	0.015	0.031	0.1223	0.0011	0.1222	0.0011	1.0
16 OL 27B	Wadi Tayin	harzburgite	16 OL 27A	0.784	2.01118	4.843	0.003	0.314	0.009	3.38E-12	2.68E-14	0.312	0.009	0.1252	0.0011	0.1247	0.0011	0.6
16 OL 27A	Wadi Tayin	px-bearing dunite (band)	16 OL 27B	0.784	2.01151	4.998	0.003	0.079	0.009	3.49E-12	1.36E-14	0.077	0.009	0.1256	0.0010	0.1255	0.0010	0.6

Os isotopic compositions in whole rock were analyzed at the CRPG laboratory in Nancy (France) using N-TIMS (Finnigan MAT 262) and MC-ICPMS (Neptune +). All uncertainties are 2  $\sigma$  and include all recognized sources of uncertainty, including in-run analytical precision, reproducibility of standard analyses, uncertainties related to the variability of the blank and its isotope composition, uncertainties related to the age correction (95 Ma). Duplicate analyses were performed for several samples (noted "-d") and UB-N standard. Samples belonging to the same harzburgite/dunite pair were collected in close proximity (<1 meter). For each sample, an approximate estimation of its height in the mantle section was obtained by normalizing to the total section height to compare samples from different cross-sections. Re-depletion model ages (T<sub>RD</sub>) were calculated by comparing measured <sup>187</sup>Os/<sup>188</sup>Os values directly with the mantle evolution curve. They represent minimum ages of melt extraction and should not be equated with true ages. Hzb = harzburgite; Dun = dunite; Px = pyroxene; Opx = orthopyroxene; Cpx = clinopyroxene; Pl = plagioclase.





Table A.8

Table A.8. Different components of the uncertainties on Re and Os concentrations and Os isotope compositions entering into the total uncertainties (suite)

Sample	Mass (g)	Associated Re blank	Associated Os blank	[Re] uncertainty			Total <sup>187</sup> Re uncertainty (2σ) (M/g)	<sup>187</sup> Re/ <sup>188</sup> Os uncertainty (2σ)	Effect of <sup>187</sup> Re/ <sup>188</sup> Os uncertainty on <sup>187</sup> Os/ <sup>188</sup> Os age correction (2σ)	Total uncertainty initial <sup>187</sup> Os/ <sup>188</sup> Os (2σ)	Total <sup>187</sup> Os/ <sup>188</sup> Os uncertainty (%)
				measurement (2σ-m) (ppb)	due to blank variability (2σ)	Total (2σ)					
<i>Moho Transition Zone (MTZ) peridotites</i>											
10 OM 25	1.0926	a	a	0.0011	0.007	0.007	2.48E-14	0.090	0.00014	0.00055	0.40
10 OM 45C	1.08114	a	a	0.0006	0.007	0.007	2.49E-14	0.038	0.00006	0.00064	0.44
18 OK 26	1.53157	d	d	0.0002	0.051	0.051	1.71E-13	0.393	0.00062	0.00086	0.59
10 OM 5C*	1.0117	a	a						0.00006	0.00052	0.37
10 OM 5C-d	1.00295	a	a	0.0020	0.008	0.008	2.76E-14	0.037			
07 OD 1	1.07011	a	a	0.0029	0.007	0.008	2.69E-14	0.100	0.00016	0.00057	0.41
16 OL 11B	2.00833	b	b	0.0000	0.038	0.038	1.29E-13	0.158	0.00025	0.00085	0.57
16 OL 34B	2.00647	b	c	0.0000	0.043	0.043	1.45E-13	0.091	0.00014	0.00200	1.51
<i>Main mantle section (MMS) peridotites</i>											
16 OD 5C	2.03522	c	c	0.0008	0.009	0.009	3.04E-14	0.019	0.00003	0.00199	1.69
16 OD 5D	2.04176	c	c	0.0002	0.009	0.009	3.02E-14	0.010	0.00002	0.00116	1.03
16 OD 7	2.0202	c	c	0.0000	0.009	0.009	3.05E-14	0.015	0.00002	0.00160	1.28
16 OD 4D <sub>Hzb</sub>	1.61671	b	b	0.0001	0.054	0.054	1.81E-13	0.047	0.00007	0.00054	0.46
16 OD 9C	2.03326	c	c	0.0001	0.009	0.009	3.03E-14	0.012	0.00002	0.00134	1.04
16 OD 2	2.02082	c	c	0.0008	0.009	0.009	3.06E-14	0.010	0.00002	0.00114	0.88
16 OD 1A	1.72667	b	b	0.0003	0.050	0.050	1.69E-13	0.058	0.00009	0.00059	0.48
16 OD 10	2.07269	c	c	0.0006	0.009	0.009	2.98E-14	0.009	0.00002	0.00106	0.81
11 OD 15A	1.00937	a	a	0.0010	0.008	0.008	2.68E-14	0.010	0.00002	0.00057	0.48
07 OD 24	1.03742	a	a	0.0075	0.008	0.011	3.60E-14	0.011	0.00002	0.00051	0.38
07 OD 27B	1.02319	a	a	0.0025	0.008	0.008	2.76E-14	0.009	0.00001	0.00052	0.41
07 OD 8C	1.049	a	a	0.0061	0.008	0.010	3.28E-14	0.009	0.00001	0.00066	0.51
07 OD 8C-d	1.01024	a	a	0.0030	0.008	0.008	2.84E-14	0.008	0.00001	0.00056	0.45
16 OD 4C	1.56818	b	b	0.0001	0.055	0.055	1.86E-13	0.239	0.00038	0.00106	0.80
16 OD 4D <sub>Dun</sub>	1.53878	b	b	0.0002	0.056	0.056	1.90E-13	0.046	0.00007	0.00055	0.43
16 OD 9A	2.04511	c	c	0.0008	0.009	0.009	3.02E-14	0.004	0.00001	0.00063	0.43
16 OD 1B	2.02651	b	b	0.0001	0.043	0.043	1.44E-13	0.066	0.00010	0.00065	0.49
16 OD 1B-d	2.01184	b	b	0.0001	0.043	0.043	1.45E-13	0.048	0.00008	0.00061	0.46
16 OD 31	2.00913	c	c	0.0022	0.009	0.009	3.15E-14	0.023	0.00004	0.00215	1.72
<i>Basal peridotites</i>											
16 OD 13C	2.01014	b	b	0.0004	0.043	0.043	1.45E-13	0.047	0.00007	0.00054	0.43
16 OD 13C-d	2.01725	b	b	0.0003	0.043	0.043	1.45E-13	0.051	0.00008	0.00058	0.46
16 OL 25	2.0261	c	c	0.0001	0.009	0.009	3.04E-14	0.007	0.00001	0.00088	0.66
16 OL 26B	2.01238	b	c	0.0000	0.032	0.032	1.09E-13	0.048	0.00008	0.00148	1.22
16 OL 27B	2.01118	c	c	0.0005	0.009	0.009	3.07E-14	0.009	0.00001	0.00107	0.86
16 OL 27C	2.00975	c	c	0.0000	0.009	0.009	3.06E-14	0.011	0.00002	0.00121	1.07
16 OL 28B	2.02988	b	c	0.0001	0.043	0.043	1.44E-13	0.046	0.00007	0.00113	0.97
16 OL 29	2.03098	c	c	0.0002	0.009	0.009	3.03E-14	0.008	0.00001	0.00100	0.82
16 OL 24	2.00603	c	c	0.0003	0.009	0.009	3.07E-14	0.008	0.00001	0.00097	0.79
16 OD 13B	1.57217	b	b	0.0001	0.055	0.055	1.86E-13	0.037	0.00006	0.00054	0.44
16 OD 15E	1.55944	b	b	0.0000	0.056	0.056	1.87E-13	0.117	0.00019	0.00070	0.60
16 OD 18B	2.01165	b	b	0.0000	0.030	0.030	1.02E-13	0.024	0.00004	0.00060	0.47
16 OD 19A	2.00354	b	b	0.0000	0.043	0.043	1.46E-13	0.269	0.00043	0.00120	1.03
16 OL 26A	2.01473	b	c	0.0000	0.029	0.029	9.64E-14	0.031	0.00005	0.00112	0.92
16 OL 27A	2.01151	c	c	0.0001	0.009	0.009	3.06E-14	0.009	0.00001	0.00102	0.82
14 11E	1.03494	a	a	0.0020	0.008	0.008	2.68E-14	0.026	0.00004	0.00053	0.42
<i>UB-N Standard</i>											
UB-N 1	1.52295	b	b	0.0001	0.057	0.057	1.92E-13	0.098	0.00016	0.00068	0.53
UB-N 2	1.71621	b	b	0.0001	0.051	0.051	1.70E-13	0.062	0.00010	0.00058	0.46
UB-N 3	2.00842	b	b	0.0000	0.043	0.043	1.45E-13	0.059	0.00009	0.00057	0.45
UB-N 4	2.04999	b	b	0.0001	0.042	0.042	1.42E-13	0.051	0.00008	0.00060	0.47

## Table A.8

### Notes:

*Column C*: Re blanks associated with four different analytical periods: a)  $0.008 \pm 0.008$  ng (n = 1, uncertainty assumed); b)  $0.061 \pm 0.087$  ng (n = 9); c)  $0.011 \pm 0.018$  ng (n = 4); d)  $0.042 \pm 0.039$  ng (n = 4); uncertainties  $2\sigma$

*Column D*: Os blanks associated with three different analytical periods: a)  $0.0009 \pm 0.0022$  ng,  $^{187}\text{Os}/^{188}\text{Os} = 0.140 \pm 0.056$  (n = 3); b)  $0.0086 \pm 0.0103$  ng,  $^{187}\text{Os}/^{188}\text{Os} = 0.138 \pm 0.220$  (n = 6); c)  $0.0085 \pm 0.0052$  ng,  $^{187}\text{Os}/^{188}\text{Os} = 1.45 \pm 0.81$  (n = 3); d)  $0.0007 \pm 0.0001$  ng,  $^{187}\text{Os}/^{188}\text{Os} = 0.209 \pm 0.122$  (n = 4); uncertainties  $2\sigma$

Elevated Os blanks in period (b) traced to impure Pt filament material; Elevated Os blanks in period (c) traced to  $\text{Cr}^{\text{VI}}$  solution used in microdistillation

*Column E*: Based on in-run uncertainty on  $^{190}\text{Os}/^{188}\text{Os}$  used in isotope dilution calculations

*Column F*: From difference between [Os] corrected using Os blank +  $2\sigma$  and [Os] corrected using Os blank -  $2\sigma$

*Column G*: Total uncertainty on [Os] based on combination of uncertainties in columns E and F (square root of individual values squared)

*Column H*: Based on in-run uncertainty on  $^{190}\text{Os}/^{188}\text{Os}$  used in isotope dilution calculations

*Column I*: From difference between  $^{188}\text{Os}$  corrected using Os blank +  $2\sigma$  and  $^{188}\text{Os}$  corrected using Os blank -  $2\sigma$

*Column J*: Total uncertainty on  $^{188}\text{Os}$  based on combination of uncertainties in columns H and I

*Column K*: In-run uncertainty on  $^{187}\text{Os}/^{188}\text{Os}$

*Column L*: From difference between  $^{187}\text{Os}/^{188}\text{Os}$  corrected using  $^{188}\text{Os}$  blank +  $2\sigma$  and  $^{187}\text{Os}/^{188}\text{Os}$  corrected using  $^{188}\text{Os}$  blank -  $2\sigma$ ; blank  $^{187}\text{Os}/^{188}\text{Os}$  held constant at mean value

*Column M*: From difference between  $^{187}\text{Os}/^{188}\text{Os}$  corrected using  $^{187}\text{Os}/^{188}\text{Os}$  blank +  $2\sigma$  and  $^{187}\text{Os}/^{188}\text{Os}$  corrected using  $^{187}\text{Os}/^{188}\text{Os}$  blank -  $2\sigma$ ; blank  $^{188}\text{Os}$  held constant at mean value

*Column N*: Long-term  $2\sigma$  reproducibility of in-house liquid standard run by peak jumping on an ETP electron multiplier

*Column O*: Total uncertainty on  $^{187}\text{Os}/^{188}\text{Os}$  based on combination of uncertainties in columns K through N

*Column P*: Based on in-run uncertainty on  $^{187}\text{Re}/^{185}\text{Re}$  used in isotope dilution calculations

*Column Q*: From difference between [Re] corrected using Re blank +  $2\sigma$  and [Re] corrected using Re blank -  $2\sigma$

*Column R*: Total uncertainty on [Re] based on combination of uncertainties in columns P and Q

*Column S*: Total uncertainty on  $^{187}\text{Re}$  - proportional to total uncertainty on [Re]

*Column T*: Total uncertainty on  $^{187}\text{Re}/^{188}\text{Os}$  based on combination of uncertainties in columns J and S

*Column U*: Uncertainty on age (95 Ma) corrected value of  $^{187}\text{Os}/^{188}\text{Os}$  related to  $^{187}\text{Re}/^{188}\text{Os}$  uncertainty.

Uncertainties on age correction related to  $^{187}\text{Re}$  decay constant, ophiolite age and spike calibration are not considered as they should be very small and systematic for all samples (ie, they cannot produce inter-sample variability)

*Column V*: Total uncertainty on initial  $^{187}\text{Os}/^{188}\text{Os}$  based on combination of uncertainty on measured value (column O) and uncertainty related to age correction (column U)

*Columns G, J, O, R, T and V are reported in main data table*

Table A.9

Table A.9. Petrostructural data and locations of additional (not analyzed) Oman peridotites

Sample	Massif	Lithology	UTM coordinates			Location in the unit	Texture			Serpentinization	Observations
			Zone	E	N		T°	Type	Overgrowth		
<i>Moho Transition Zone (MTZ) peridotites</i>											
11 OD 12	Sumail	cpx-impregnated harzburgite	40Q	594389	2549250		HT	porphyroclastic		Cpx	
11 OD 14B	Sumail	pl-impregnated depleted harzburgite	40Q	596591	2554996	lower part	HT	porphyroclastic		PI	like HD4 in Boudier and Nicolas (1995)
16 OD 24A	Sumail	slightly depleted harzburgite	40Q	594414	2559213	lower part	HT	porphyroclastic			
16 OL 11A	Wadi Tayin	harzburgite	40Q	64615	2534373	lower part	?	?		very high	
16 OL 11C	Wadi Tayin	harzburgite	40Q	64615	2534373	lower part	HT	porphyroclastic			corroded opx
95 OD 72A	Sumail	dunite	40Q	595049	2558287		HT	porphyroclastic			
95 OD 72B	Sumail	pl-impregnated dunite	40Q	595049	2558287		HT	porphyroclastic		PI	
95 OD 73A	Sumail	dunite	40Q	595638	2558160		HT	porphyroclastic			
95 OD 73B	Sumail	dunite	40Q	595638	2558160		HT	porphyroclastic			
95 OD 74C	Sumail	dunite	40Q	595932	2558019		HT	granular			
95 OD 74D	Sumail	dunite	40Q	595932	2558019		HT	porphyroclastic			
95 OD 78B	Sumail	pl-impregnated dunite	40Q	594068	548362		HT	porphyroclastic		PI	
95 OD 93A	Sumail	dunite	40Q	596681	2548965	upper part	HT	porphyroclastic			
95 OD 102B	Sumail	dunite	40Q	596103	2549077	lower part	HT	porphyroclastic			
95 OD 102C	Sumail	dunite	40Q	596103	2549077	lower part	HT	porphyroclastic			
95 OD 103	Sumail	dunite	40Q	595843	2549009	lower part	HT	porphyroclastic			
95 OD 116	Sumail	dunite	40Q	598021	254461		HT	porphyroclastic			high alteration
95 OD 117	Sumail	dunite	40Q	5978771	2544316	upper part	HT	porphyroclastic			high alteration
95 OD 155	Sumail	dunite	40Q	599081	2553910		HT	granular			
95 OD 159	Sumail	dunite	40Q	602268	2552323		HT	porphyroclastic			
95 OD 160	Sumail	dunite	40Q	602264	2551404		HT	granular			
10 OM 6A	Sumail	dunite	40Q	632002	2572609		HT	porphyroclastic-granular			
10 OM 23	Sumail	pl-impregnated dunite/harzburgite	40Q	601898	2546550	lower part	HT	granular		PI	opx relics
10 OM 24	Sumail	dunite	40Q	601871	2546550	upper part	BT-MT	porphyroclastic (highly recrystallized)			patches of harzburgite on the field
10 OM 27A	Sumail	dunite	40Q	602180	2550599		HT	porphyroclastic			
10 OM 38A	Sumail	pl-impregnated dunite	40Q	631849	2572578	upper part	HT	granular	x	PI	
10 OM 38B	Sumail	pl-impregnated dunite	40Q	631849	2572578	upper part	HT	granular	x	PI	
10 OM 39D	Sumail	dunite	40Q	630829	2572466		HT	granular	x		
10 OM 41B	Sumail	pl-impregnated dunite	40Q	597815	2555107		HT	porphyroclastic		PI	
10 OM 41C	Sumail	cpx-impregnated dunite	40Q	597822	2555086	lower part	HT	granular		Cpx	
11 OD 1	Sumail	cpx-impregnated dunite	40Q	594854	2554088		HT	granular	x	Cpx	
11 OD 9	Sumail	cpx-impregnated dunite	40Q	594397	2549344		HT	porphyroclastic		Cpx	
11 OD 14C	Sumail	dunite	40Q	596591	2554996	lower part	HT	porphyroclastic			strong fabric
16 OD 26C	Sumail	opx-bearing dunite	40Q	595042	255814	Middle part	HT	porphyroclastic			minor opx relics
16 OD 27A	Sumail	dunite	40Q	594458	2557057	Lower part, near chromite pod	HT	porphyroclastic			
16 OL 33A	Wadi Tayin	dunite	40Q	671774	2529727	upper part	HT?	?		very high	
<i>Main mantle section (MMS) peridotites</i>											
16 OD 1C	Nakhl-Rustaq	harzburgite	40Q	567413	2586883		HT	porphyroclastic			Fig. 2b (right)
16 OD 1E	Nakhl-Rustaq	harzburgite	40Q	567413	2586883		HT	porphyroclastic			Fig. 2b (right)
16 OD 3C	Nakhl-Rustaq	harzburgite	40Q	568112	2589151		BT	fine-grained porphyroclastic			shear zone
16 OD 4A	Nakhl-Rustaq	cpx-bearing harzburgite/dunite band	40Q	568596	2590641		HT	porphyroclastic			dunite band in harzburgite
16 OD 5A	Nakhl-Rustaq	harzburgite	40Q	5682245	2591884	upper part	BT	porphyroclastic			
16 OD 5B	Nakhl-Rustaq	harzburgite	40Q	5682245	2591884	upper part	BT	porphyroclastic			
16 OD 6	Nakhl-Rustaq	harzburgite	40Q	568245	2591598	upper part	HT	porphyroclastic			
16 OD 8	Nakhl-Rustaq	harzburgite	40Q	568308	2590790		HT	porphyroclastic			
16 OD 11	Nakhl-Rustaq	harzburgite	40Q	56818	258458		HT	porphyroclastic			
16 OD 12	Nakhl-Rustaq	cpx-bearing harzburgite	40Q	56851	258394		HT	porphyroclastic			
10 OM 15A	Sumail	harzburgite	40Q	625705	2568202		HT	porphyroclastic			
10 OM 34	Sumail	harzburgite	40Q	633517	2563065		HT	porphyroclastic			
10 OM 35	Sumail	harzburgite	40Q	633575	2563069		HT	porphyroclastic			
10 OM 37	Sumail	harzburgite	40Q	633190	2572022	upper part	HT	porphyroclastic			
16 OD 22	Sumail	highly depleted harzburgite	40Q	593533	2563121		HT	porphyroclastic			
16 OD 23	Sumail	cpx-bearing depleted harzburgite	40Q	59469	256153	upper part	MT-HT	porphyroclastic			

Table A.9

Table A.9. Petrostructural data and locations of additional (not analyzed) Oman peridotites (suite)

Sample	Massif	Lithology	UTM coordinates			Location in the unit	Texture			Serpentinization	Observations
			Zone	E	N		T°	Type	Overgrowth		
18 OK 1	Sumail	cpx-bearing harzburgite	40Q	588317	2547878		HT	porphyroclastic			rare cpx
18 OK 2	Sumail	harzburgite	40Q	588472	2547120		HT	porphyroclastic			
18 OK 3B	Sumail	cpx-bearing harzburgite	40Q	588967	2545903		HT	porphyroclastic			
18 OK 4	Sumail	harzburgite	40Q	589050	2546827		HT	porphyroclastic			
18 OK 5	Sumail	harzburgite	40Q	587985	2548355		HT	porphyroclastic			
18 OK 6	Sumail	harzburgite	40Q	590883	2545433		BT	porphyroclastic-mylonitic			shear zone
18 OK 7	Sumail	harzburgite	40Q	591641	2544459		HT	porphyroclastic		very high	
18 OK 8	Sumail	harzburgite	40Q	592607	2544510		HT	porphyroclastic			
18 OK 9	Sumail	harzburgite	40Q	593195	2545216		HT	porphyroclastic			
18 OK 10B	Sumail	harzburgite/dunite	40Q	594150	2545633		HT	porphyroclastic			dunite vein (20 cm)
18 OK 11	Sumail	harzburgite	40Q	594969	2546508	diapir	HT	porphyroclastic			
18 OK 12	Sumail	harzburgite	40Q	596122	2546421	diapir	HT	porphyroclastic			
18 OK 13	Sumail	harzburgite	40Q	597215	2547173	diapir	HT	porphyroclastic			
18 OK 14A	Sumail	harzburgite	40Q	600161	2547182	diapir	HT	porphyroclastic			
18 OK 14B	Sumail	harzburgite	40Q	600161	2547182	diapir	HT	porphyroclastic			
18 OK 16B	Sumail	harzburgite	40Q	595083	2542590		HT	porphyroclastic			
18 OK 17	Sumail	harzburgite	40Q	595718	2542515	upper part	HT	porphyroclastic			
18 OK 18	Sumail	cpx-bearing harzburgite	40Q	595852	2542428	upper part	HT	porphyroclastic			
18 OK 19	Sumail	harzburgite	40Q	595935	2542285	upper part	HT	porphyroclastic			
95 OD 76	Sumail	harzburgite	40Q	594285	2548265		HT	porphyroclastic			
95 OD 77	Sumail	harzburgite	40Q	594222	2548362	upper part	HT	porphyroclastic			
95 OD 79	Sumail	harzburgite	40Q	594156	254714		HT	porphyroclastic			
95 OD 93B	Sumail	harzburgite	40Q	596681	2548965	upper part	HT	porphyroclastic			
95 OD 94	Sumail	harzburgite	40Q	597100	2548927	upper part	HT	porphyroclastic			
95 OD 101	Sumail	harzburgite	40Q	596050	2548670	upper part	HT	porphyroclastic			
95 OD 101	Sumail	harzburgite	40Q	595648	2548580	upper part	HT	porphyroclastic			
16 OD 32B	Wadi Tayin	harzburgite	40Q	660745	253669		HT	porphyroclastic			
16 OL 5	Wadi Tayin	cpx-bearing harzburgite	40Q	663309	2541531		MT	porphyroclastic			rare cpx, corroded opx
16 OL 8	Wadi Tayin	harzburgite	40Q	663411	2539649			(Ol, annealing) granular-(Opx) porphyroclastic			corroded opx
16 OL 9	Wadi Tayin	cpx-bearing harzburgite	40Q	663126	2538736		HT	porphyroclastic			rare cpx, corroded opx
16 OL 30A	Wadi Tayin	depleted harzburgite	40Q	668927	2540819		HT	porphyroclastic			
16 OL 31	Wadi Tayin	harzburgite	40Q	670696	2538435		HT	porphyroclastic		high	
18 OK 39A	Wadi Tayin	harzburgite	40Q	646492	2537111	upper part	HT	equigranular-porphyroclastic			
16 OD 1D	Nakhl-Rustaq	dunite	40Q	567413	2586883		HT	porphyroclastic			<i>Fig. 2b (right)</i>
16 OD 3A	Nakhl-Rustaq	dunite	40Q	568112	2589151		BT	mylonitic-ultramylonitic			shear zone
16 OD 3B	Nakhl-Rustaq	dunite	40Q	568112	2589151		BT	mylonitic-ultramylonitic			shear zone
18 OK 14C	Sumail	dunite	40Q	600161	2547182	diapir	HT	granular			centimetric dunite band
18 OK 18A	Sumail	dunite	40Q	595083	2542590		HT	porphyroclastic			few dunite layers (50 cm)
18 OK 18B	Sumail	dunite	40Q	595849	2542414		HT	porphyroclastic			centimetric dunite patch
16 OD 34A	Wadi Tayin	dunite	40Q	66240	253816		HT	granular	x		dunite vein with troctolite vein
16 OL 30B	Wadi Tayin	dunite	40Q	668927	2540819		HT?	?		very high	centimetric dunite vein
16 OL 30C	Wadi Tayin	dunite	40Q	668927	2540819		HT?	?		very high	centimetric dunite vein
16 OD 9B	Nakhl-Rustaq	pyroxenite	40Q	568916	2590322		HT	porphyroclastic			
<i>Basal peridotites</i>											
16 OD 14	Nakhl-Rustaq	cpx-bearing harzburgite	40Q	56484	2581375	upper part	MT	porphyroclastic			
16 OD 15A	Nakhl-Rustaq	cpx-bearing highly depleted harzburgite	40Q	562332	2579470	lower part	BT	porphyroclastic			
16 OD 15B	Nakhl-Rustaq	harzburgite	40Q	562332	2579470	lower part	HT	porphyroclastic			
16 OD 15D	Nakhl-Rustaq	depleted harzburgite	40Q	562332	2579470	lower part	BT	porphyroclastic			dunite band (1 m)
16 OD 16	Nakhl-Rustaq	cpx-bearing harzburgite	40Q	564482	2580547	upper part	BT	porphyroclastic			
16 OD 18A	Sumail	harzburgite	40Q	60169	258063	lower part	MT	porphyroclastic		high	looked like dunite band on the field
137K	Wadi Tayin	cpx-bearing harzburgite	40Q	647918	255989		BT	porphyroclastic-mylonitic			
16 OL 1 Top	Wadi Tayin	cpx-bearing harzburgite	40Q	649811	255852		BT	porphyroclastic			
16 OL 2A	Wadi Tayin	cpx-bearing harzburgite	40Q	66407	254479	upper part	BT	porphyroclastic			
16 OL 2B	Wadi Tayin	harzburgite	40Q	66407	254479	upper part	BT	porphyroclastic			looked like dunite on the field

Table A.9

Table A.9. Petrostructural data and locations of additional (not analyzed) Oman peridotites (suite)

Sample	Massif	Lithology	UTM coordinates			Location in the unit	Texture			Serpentinization	Observations
			Zone	E	N		T°	Type	Overgrowth		
16 OL 4	Wadi Tayin	cpx-bearing harzburgite	40Q	66332	254201	upper part	MT	porphyroclastic			
16 OL 13	Wadi Tayin	cpx-bearing harzburgite	40Q	66793	254680		BT	porphyroclastic			
16 OL 14A	Wadi Tayin	highly depleted harzburgite	40Q	669007	2542158	upper part	HT	porphyroclastic			
16 OL 14F	Wadi Tayin	cpx-bearing harzburgite	40Q	669007	2542158	upper part	MT	porphyroclastic		high	rare cpx
16 OL 15A	Wadi Tayin	cpx-bearing harzburgite	40Q	668886	2542334	upper part	MT	porphyroclastic		high	rare cpx
16 OL 17B	Wadi Tayin	cpx-bearing harzburgite	40Q	668493	2543585	upper part	MT	porphyroclastic			
16 OL 19	Wadi Tayin	cpx-bearing harzburgite	40Q	668423	2543833		BT	porphyroclastic			rare cpx
16 OL 20A	Wadi Tayin	cpx-bearing harzburgite	40Q	668281	2544134		BT	porphyroclastic			rare cpx
16 OL 22A	Wadi Tayin	cpx-bearing harzburgite	40Q	667109	2543753		BT	porphyroclastic			looked like dunite on the field
16 OL 22B	Wadi Tayin	cpx-bearing harzburgite	40Q	667109	2543753		BT	porphyroclastic			
16 OL 23A	Wadi Tayin	cpx-bearing harzburgite	40Q	650546	2558481		BT	porphyroclastic			rare cpx
16 OL 23B	Wadi Tayin	cpx-bearing harzburgite	40Q	65082	255876		BT	porphyroclastic			rare cpx
16 OL 23C	Wadi Tayin	harzburgite	40Q	65082	255876		BT	porphyroclastic			looked like dunite on the field
16 OL 36B	Wadi Tayin	depleted harzburgite	40Q	685823	2539683	lower part	BT	porphyroclastic-mylonitic			
16 OL 37A	Wadi Tayin	harzburgite	40Q	67091	2548834	lower part	BT	porphyroclastic			looked like dunite on the field
18 OK 28B	Wadi Tayin	harzburgite/dunite	40Q	650429	2561757	lower part	MT	porphyroclastic		high	dunite band (10 cm) in harzburgite
18 OK 29C	Wadi Tayin	harzburgite	40Q	650374	2561598	lower part	MT	porphyroclastic		high	
1410A	Haylayn	cpx-bearing harzburgite	40Q	492880	266869		BT	porphyroclastic			
1410B	Haylayn	harzburgite	40Q	492885	2616877		BT	porphyroclastic			
1411B	Haylayn	cpx-bearing harzburgite	40Q	493063	2616885		BT	porphyroclastic			very rich in cpx
16 OL 38C	Mascate	cpx-bearing harzburgite	40Q	6601713	2613235		MT	porphyroclastic			
1447A	Mascate	harzburgite	40Q	660210	2613269		BT-MT	porphyroclastic		very high	
16 OL 38B	Mascate	harzburgite	40Q	6601713	2613235		MT	porphyroclastic			rare cpx, corroded opx
16 OD 13A	Nakhl-Rustaq	dunite	40Q	56540	2582672	upper part	HT	porphyroclastic			
137J	Wadi Tayin	dunite	40Q	649704	256162		BT			very high	
16 OL 1 Bottom	Wadi Tayin	dunite	40Q	649811	255852		BT	porphyroclastic		very high	dunite band (20 cm)
16 OL 3B	Wadi Tayin	dunite	40Q	66436	254364	upper part	?	?		very high	
16 OL 15B	Wadi Tayin	cpx-bearing dunite	40Q	668767	2542574	upper part	BT	porphyroclastic		very high	rare cpx, metric dunite blob
16 OL 15C	Wadi Tayin	cpx-bearing dunite	40Q	668730	2542844	upper part	MT	porphyroclastic		high	rare cpx, metric blobs and veins
16 OL 17A	Wadi Tayin	cpx-bearing dunite	40Q	668530	2543415		BT?	?		very high	rare cpx, dunite band (4 m)
16 OL 18	Wadi Tayin	dunite	40Q	668477	2543754	upper part	BT?	?		very high	dunite vein network (50 cm)
16 OL 28A	Wadi Tayin	dunite/clinopyroxenite	40Q	649001	2557706	upper part	HT	granular		high	
18 OK 29B	Wadi Tayin	dunite	40Q	650374	2561598	lower part	MT	porphyroclastic			dunite band (10 cm)
1447B	Mascate	dunite	40Q	660210	2613269		BT?	?		very high	
16 OL 38A	Mascate	dunite	40Q	6601713	2613235		BT-MT?	?		very high	

Hzb = harzburgite; Dun = dunite; Ol = olivine; Opx = orthopyroxene; Cpx = clinopyroxene; Pl = plagioclase; HT = high temperature (coarse-grained, asthenospheric deformation); MT = medium temperature; LT = low temperature.