

Synthesis and properties of porous carbons based on tannin-sucrose mixtures treated in hydrothermal conditions

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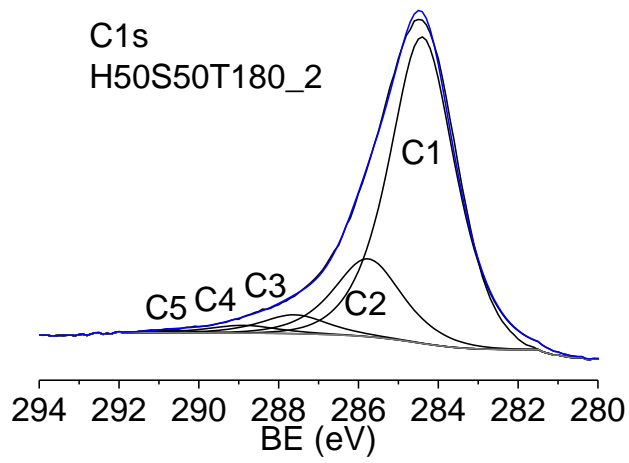
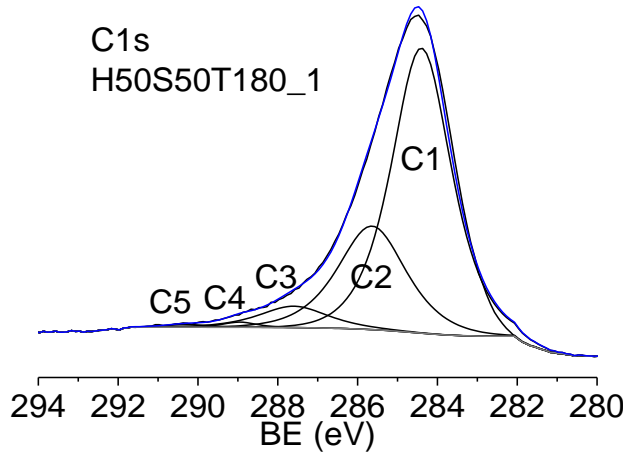
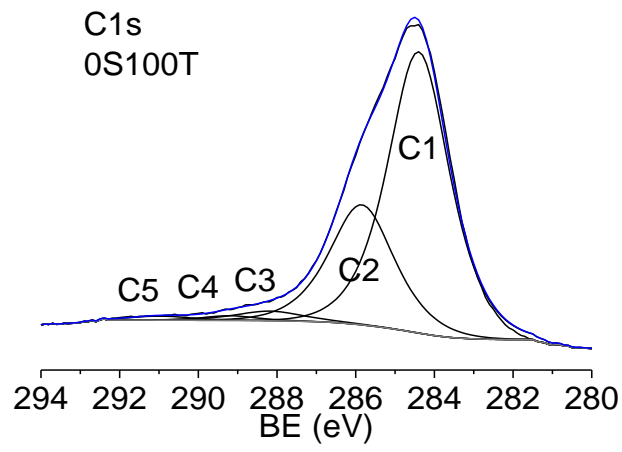
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Table S1: Textural properties and elemental analysis obtained for materials 50S50T after HTC at different temperatures (160, 180 and 200°C) and pH (unmodified and 2), and after posterior pyrolysis at 900°C.

	Yield (wt. %)			Textural Properties						Elemental Analysis (wt. %)					
	HTC	Carbon	Total	S_{NLDFT} ($\text{m}^2 \text{g}^{-1}$)	A_{BET} ($\text{m}^2 \text{g}^{-1}$)	$V_{0.97}$ ($\text{cm}^3 \text{g}^{-1}$)	$V_{DR,N2}$ ($\text{cm}^3 \text{g}^{-1}$)	V_{mes} ($\text{cm}^3 \text{g}^{-1}$)	$V_{\mu,NLDFT}$ ($\text{cm}^3 \text{g}^{-1}$)	C	H	N	S	O	C/O
After HTC															
H50S50T160_u	61.0	-	-	-	1.33	-	-	-	-	59.0	4.4	0.3	0.0	36.3	1.6
H50S50T200_u	59.2	-	-	-	0.91	-	-	-	-	62.9	4.4	0.3	0.0	32.4	1.9
H50S50T160_2	60.7	-	-	-	1.06	-	-	-	-	62.9	4.7	0.2	0.2	32.0	2.0
H50S50T200_2	59.6	-	-	-	1.10	-	-	-	-	64.7	4.4	0.2	0.1	30.6	2.1
After pyrolysis at 900°C															
CH50S50T160_u	-	47.4	28.9	546	345	0.18	0.14	0.04	0.16	92.6	0.5	0.4	0.0	6.5	14.2
CH50S50T200_u	-	51.7	30.6	916	633	0.26	0.24	0.02	0.26	93.3	0.6	0.4	0.0	5.7	16.4
CH50S50T160_2	-	42.9	26.0	1138	712	0.32	0.27	0.05	0.31	94.1	0.7	0.5	0.0	4.7	20.0
CH50S50T200_2	-	48.9	29.2	1059	725	0.29	0.27	0.02	0.30	93.3	0.8	0.7	0.0	5.2	17.9

Table S2: Textural properties and elemental analysis obtained for materials prepared at different proportions of tannin and sucrose after HTC at 180°C at different pH (unmodified and 2), and after posterior pyrolysis at 900°C.

	Yield (wt. %)			Textural Properties						Elemental Analysis (wt. %)					
	HTC	Carbon	Total	S_{NLDFT} ($m^2 g^{-1}$)	A_{BET} ($m^2 g^{-1}$)	$V_{0.97}$ ($cm^3 g^{-1}$)	$V_{DR,N2}$ ($cm^3 g^{-1}$)	V_{mes} ($cm^3 g^{-1}$)	$V_{\mu,NLDFT}$ ($cm^3 g^{-1}$)	C	H	N	S	O	C/O
After HTC															
H75S25T180_u	55.2	-	-	-	1.23	-	-	-	-	62.5	4.5	0.2	0.0	32.8	1.9
H25S75T180_u	65.5	-	-	-	1.01	-	-	-	-	60.1	4.3	0.4	0.0	35.2	1.7
H75S25T180_2	44.3	-	-	-	0.73	-	-	-	-	64.7	4.5	0.2	0.1	30.5	2.1
H25S75T180_2	67.5	-	-	-	1.26	-	-	-	-	62.4	4.7	0.2	0.0	32.6	1.9
After pyrolysis at 900°C															
CH75S25T180_u	-	49.8	27.5	873	616	0.24	0.23	0.01	0.25	91.5	0.6	0.1	0.0	7.8	11.7
CH25S75T180_u	-	51.2	33.5	944	641	0.25	0.24	0.01	0.27	90.9	0.5	0.4	0.0	8.2	11.1
CH75S25T180_2	-	51.3	22.7	994	700	0.32	0.26	0.06	0.28	93.6	0.7	0.6	0.0	5.1	18.4
CH25S75T180_2	-	47.7	32.2	1010	709	0.33	0.27	0.06	0.28	95.3	0.6	0.6	0.0	3.5	27.2



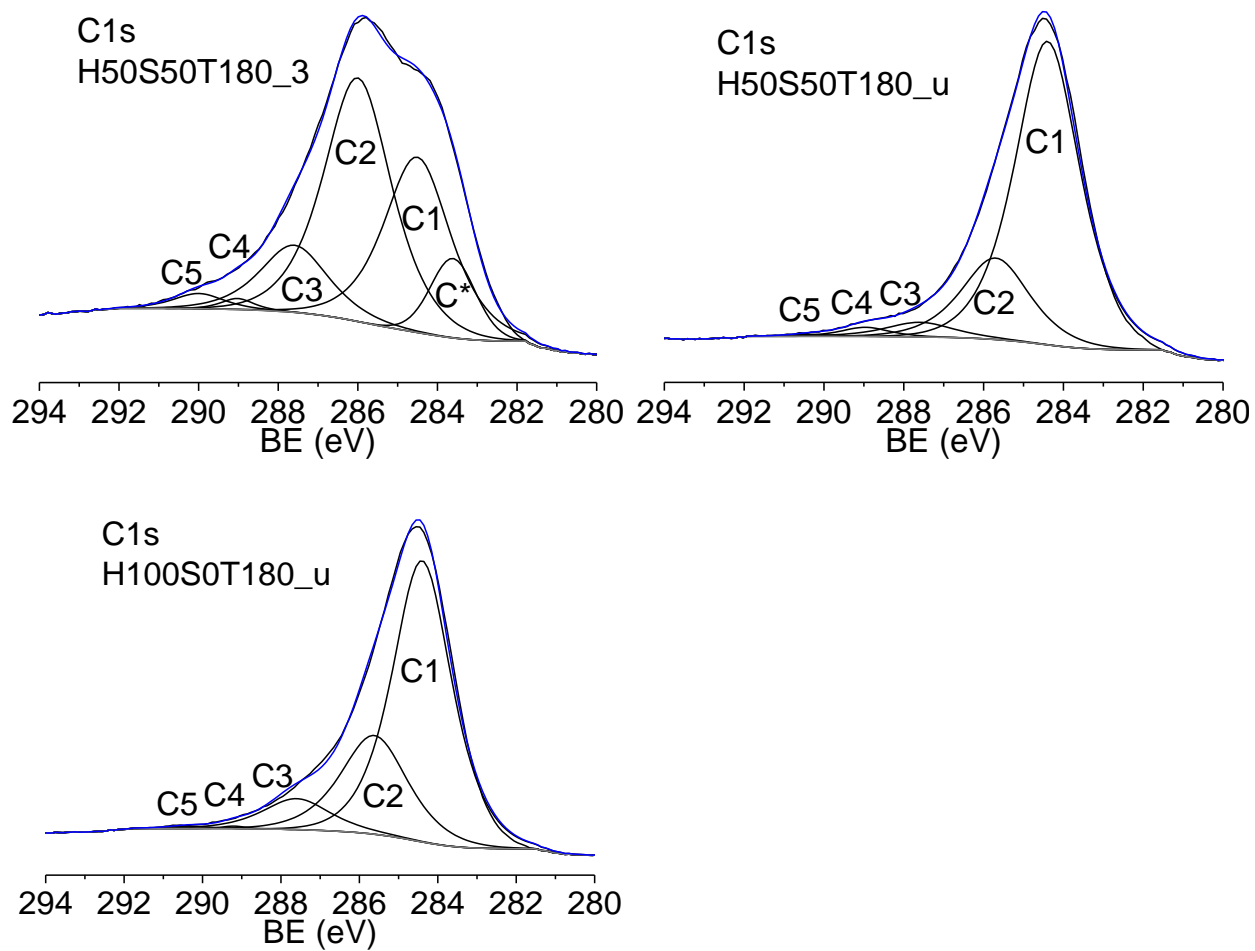
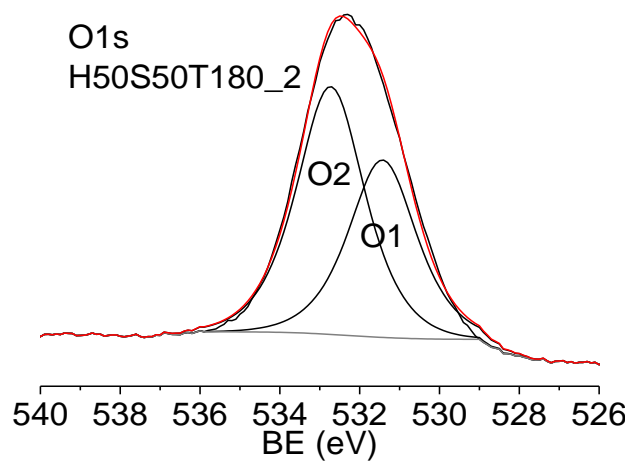
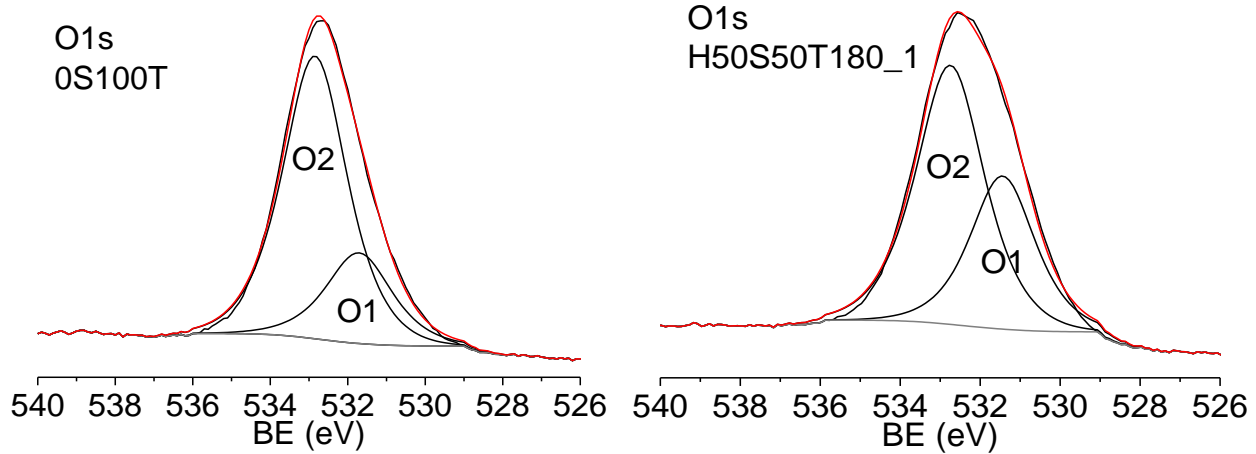


Figure S1. C1s high-resolution XPS spectra of the hydrochars.



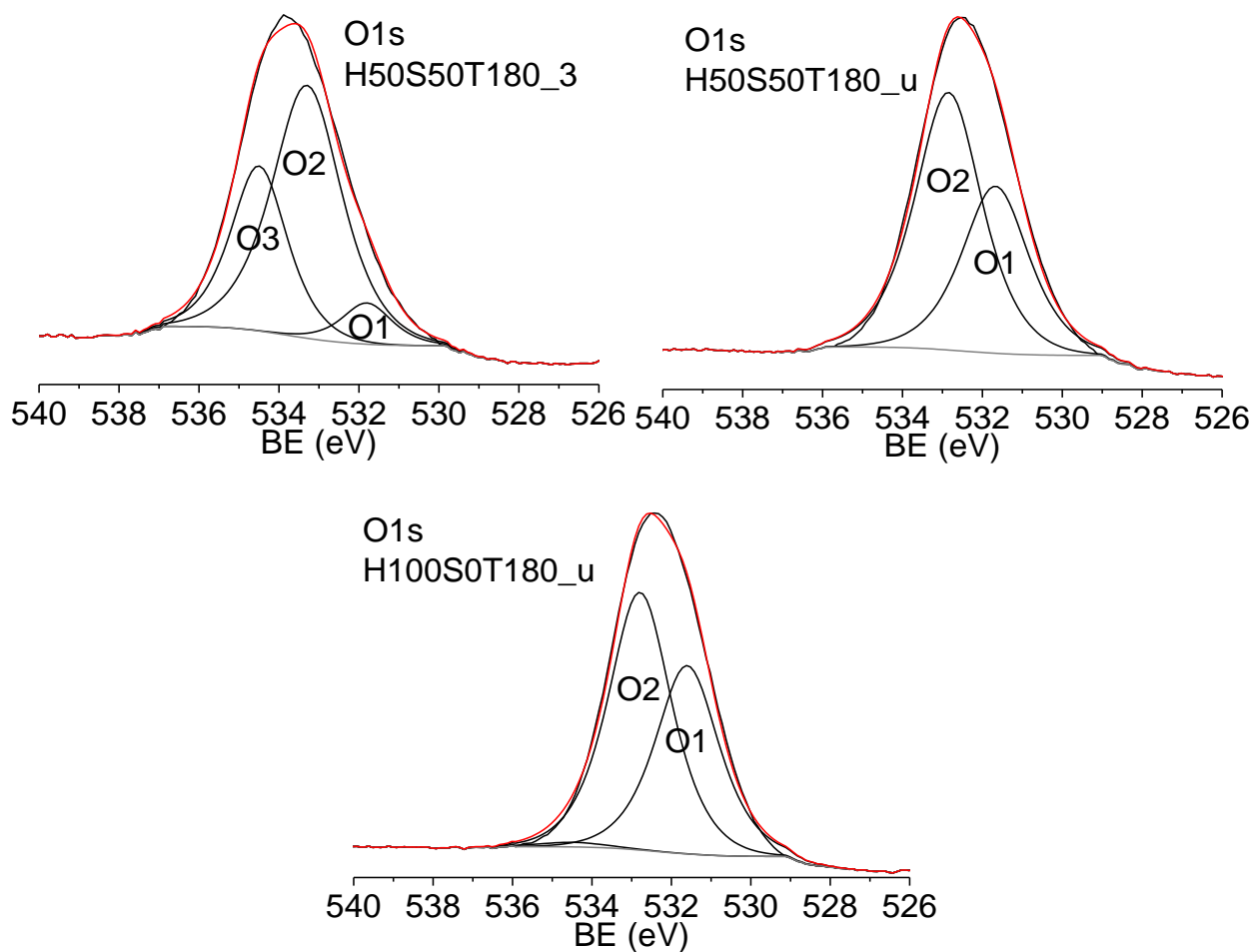


Figure S2. O1s high-resolution XPS spectra of the hydrochars.

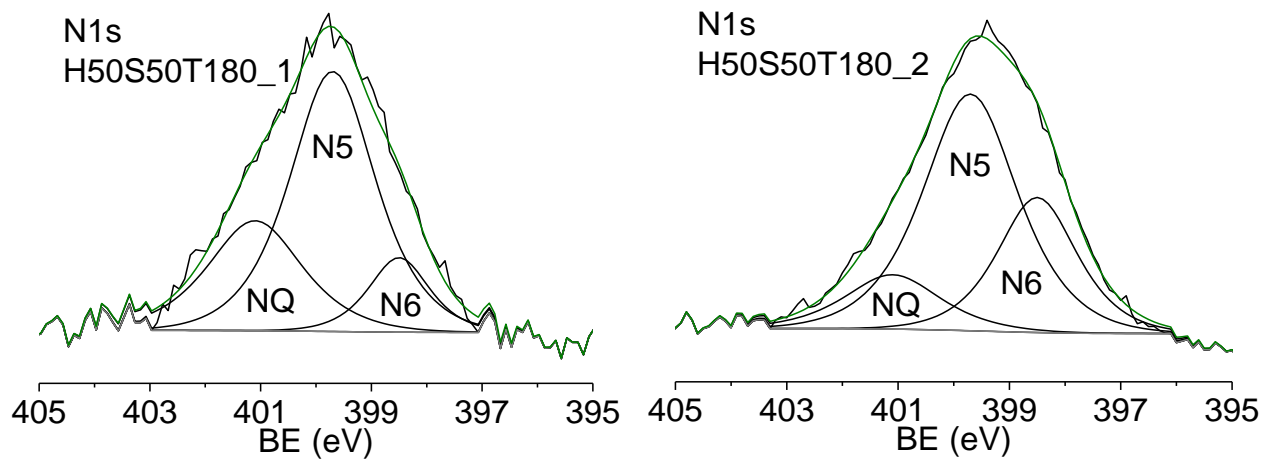


Figure S3. N1s high-resolution XPS spectra of the hydrochars.

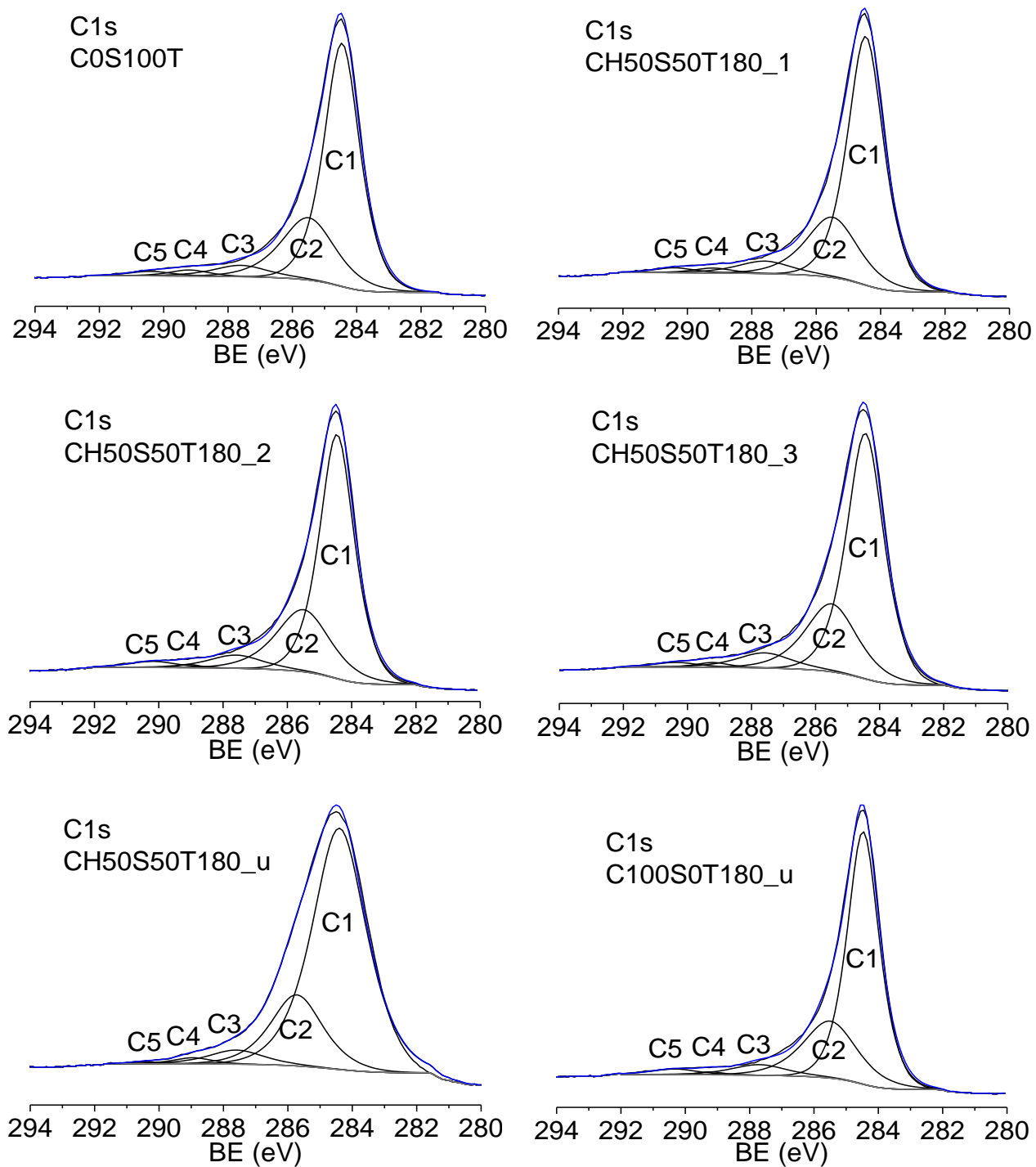
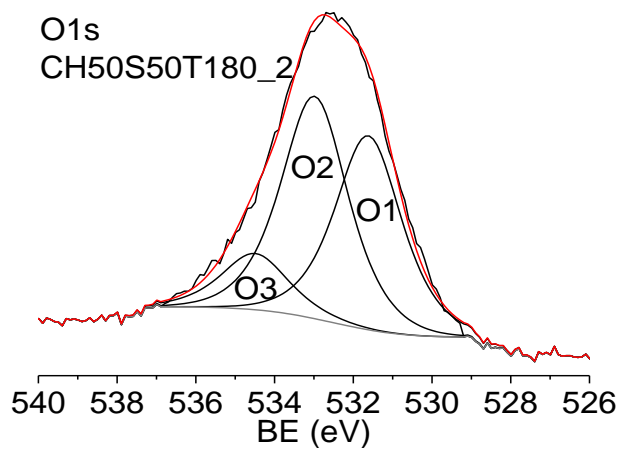
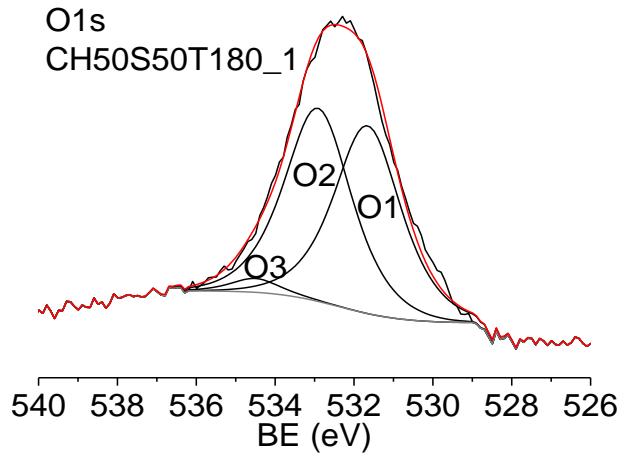
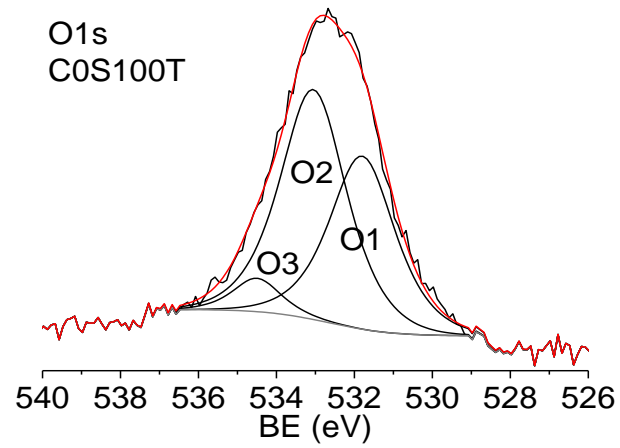


Figure S4. C1s high-resolution XPS spectra of the carbon materials.



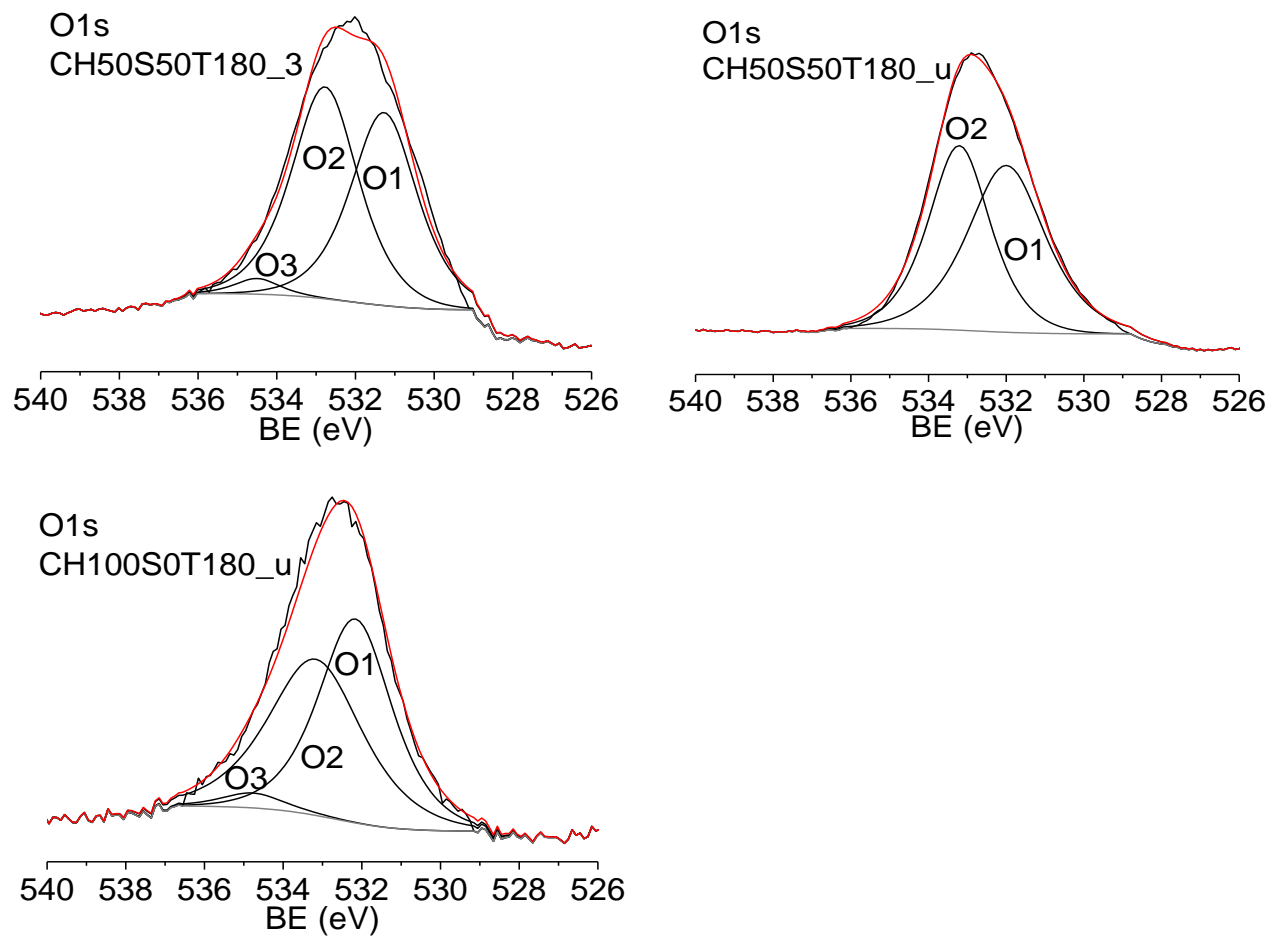


Figure S5. O1s high-resolution XPS spectra of the carbon materials.

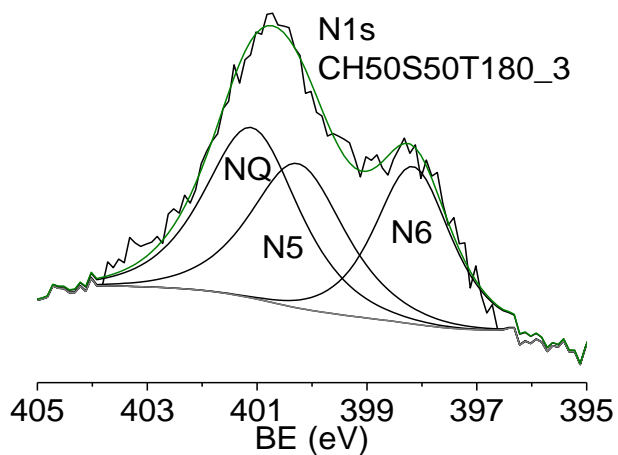


Figure S6. N1s high-resolution XPS spectra of the CH50S50T180_3 carbon.

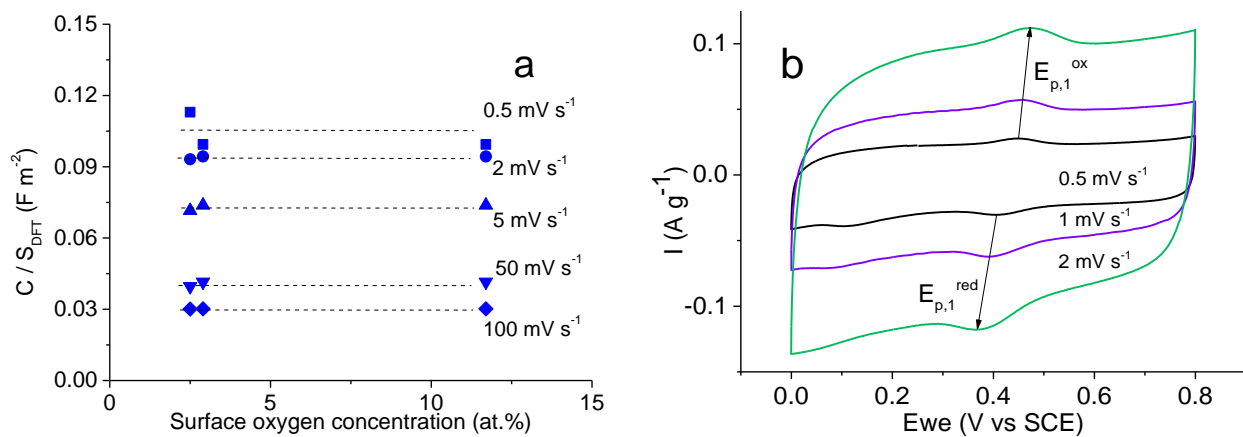


Figure S7. (a) Interfacial capacitance as a function of surface oxygen concentration from XPS; (b) CV curves of the C0S100T sample showing the progressive separation of the redox peaks associated to the redox process 1 (see main text) at scan rates increasing from 0.5 to 2 mV s^{-1} .