

The influence of the acid source on the structural and anti-oxidation properties of ordered mesoporous carbons

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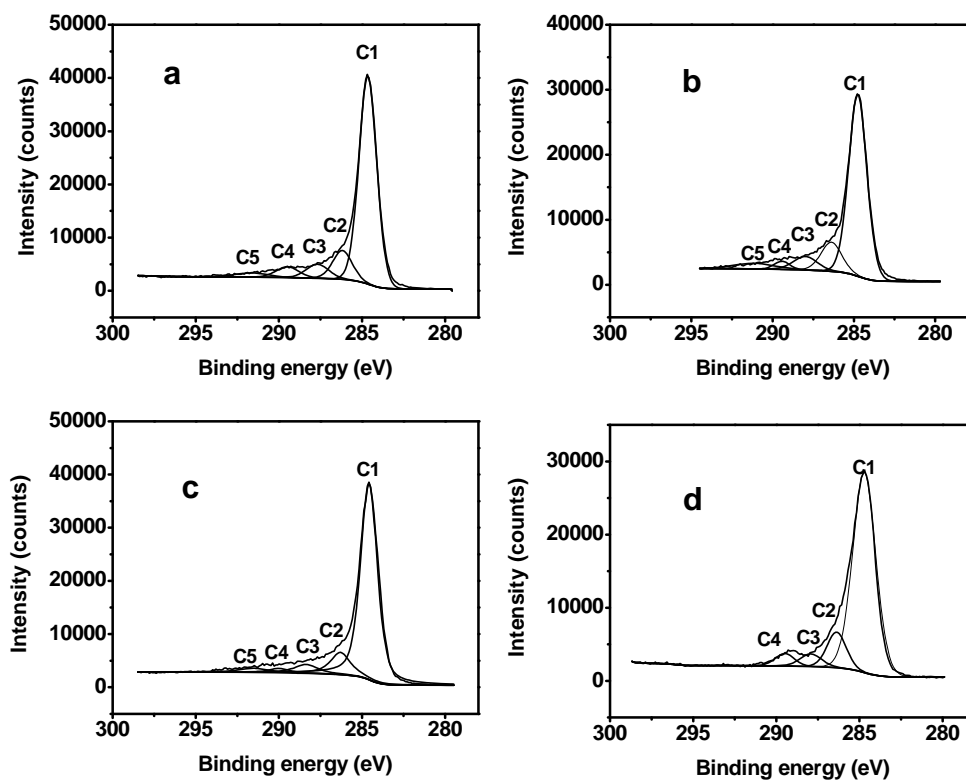


Fig. 1S XPS C1s high-resolution spectra of the non-oxidized samples: (a) OMC-HCl; (b) OMC-H₃PO₄; (c) OMC-HNO₃; (d) OMC-H₂SO₄.

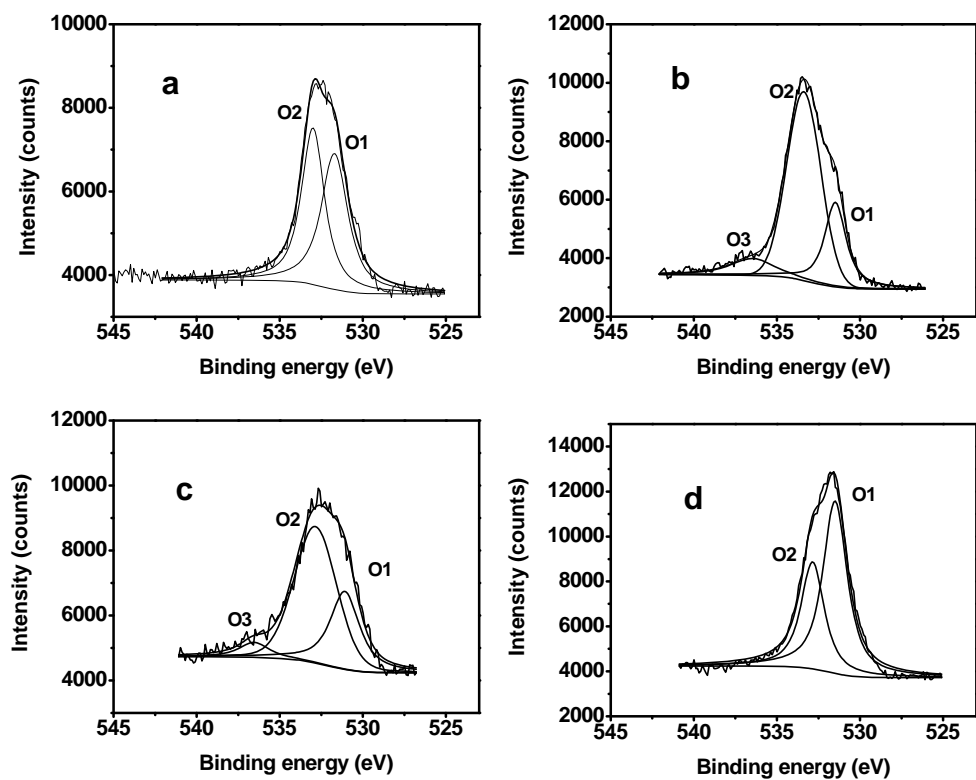


Fig. 2S XPS O1s high-resolution spectra of the non-oxidized samples: (a) O-OMC-HCl; (b) O-OMC-H₃PO₄; (c) O-OMC-HNO₃; (d) O-OMC-H₂SO₄.

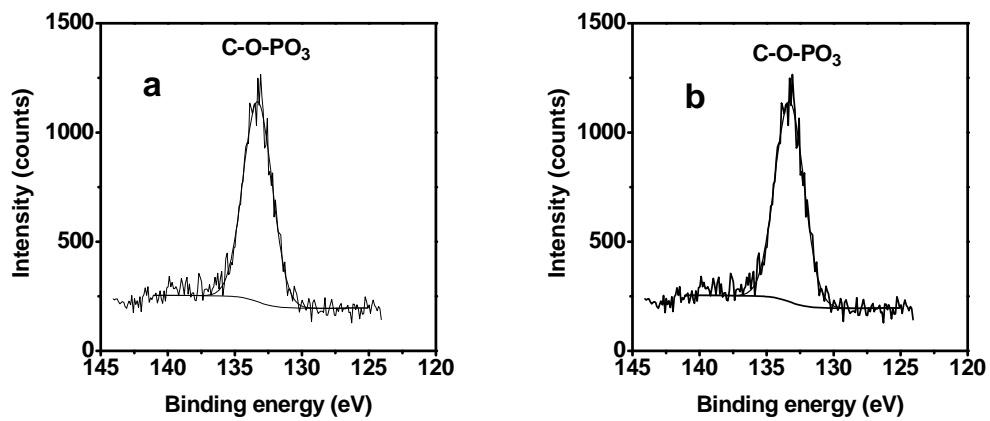


Fig. 3S XPS P2p high-resolution spectra of the samples: (a) OMC-H₃PO₄; (b) O-OMC-H₃PO₄.

Table S1. XPS assignments and elemental compositions for the samples prepared with different acid source and the corresponding oxidative samples.

sample	C1s (eV)					O1s (eV)			Atom% C:O:P
	Peak1 284.7	Peak2 286.5	Peak3 287.5	Peak4 288.8– 289.1	Peak5 291.5– 292.2	Peak1 531.6– 531.9	Peak2 533.0– 533.4	Peak3 535.9	
OMC-HCl	68.8%	11.64%	8.24%	6.8%	4.51%	48.78%	51.22%	-	92.51:7.49:0
OMC-HNO ₃	68.29%	13.45%	7.26%	6.11%	4.89%	27.83%	61.31%	10.86%	90.6:9.4:0
OMC-H ₃ PO ₄	72.06%	13.11%	7.08%	2.72%	5.04%	21.70%	65.32%	12.98%	82.93:13.8:3.27
OMC-H ₂ SO ₄	75.37%	9.71%	8.25%	6.66%	-	61.29%	38.71%	-	85.1:14.9:0
O-OMC-HCl	67.32%	14.3%	-	15.55%	2.82%	41.25%	58.75%	-	81.27:18.73:0
O-OMC-HNO ₃	66.7%	16.71%	-	13.02%	3.58%	63.48%	36.52%	-	80.42:19.58:0
O-OMC-H ₃ PO ₄	65.78%	12.69%	3.5%	16.57%	1.45%	64.25%	35.75%	-	76.08:22.04:1.88
O-OMC-H ₂ SO ₄	70.9%	12.57%	4.86%	9.73%	1.94%	73.48%	26.52%	-	79.63:20.37:0

Table S2. The distributions of the surface oxygen-containing functional groups of the carbon nanostructures determined by Boehm titration

sample	Carboxylic (mmol/g)	Lactonic (mmol/g)	Phenolic (mmol/g)	acid groups (mmol/g)
OMC-HCl	0.118	0.208	0.253	0.579
OMC-HNO ₃	0.129	0.174	0.295	0.598
OMC-H ₃ PO ₄	0.804	0.149	0.264	1.217
OMC-H ₂ SO ₄	0.093	0.167	0.412	0.672
O-OMC-HCl	0.647	0.082	0.485	1.214
O-OMC-HNO ₃	0.712	0.070	0.873	1.655
O-OMC-H ₃ PO ₄	1.241	0.203	0.757	2.201
O-OMC-H ₂ SO ₄	0.290	0.608	0.809	1.707