Electronic Supplementary Information

Polybenzoxazine-based nitrogen-containing porous carbons for high-performance supercapacitor electrode and carbon dioxide capture

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Table S1. Elemental and XPS analysis of the NPCs.

Sample	Elemental analysis (wt. %)				XPS analysis (at. %)		
	C	H	N	O	C	N	O
NPC-c	79.10	2.42	5.47	13.31	83.14	5.03	11.83
NPC-0	78.49	2.53	4.76	14.22	81.78	4.22	14.00
NPC-1	78.21	2.61	5.32	13.86	82.42	4.86	12.72
NPC-2	82.73	1.82	4.21	11.24	84.98	3.91	11.11
NPC-3	86.44	1.07	2.33	10.16	87.55	2.19	10.26

Table S2. XPS peak positions and content of each nitrogen, oxygen component.

Element	Binding energy (eV)	Content (at. %)				
		NPC-c	**NPC-0**	**NPC-1**	**NPC-2**	**NPC-3**
N	398.5 (N-6)	1.72	1.12	1.16	0.90	0.47
	400.2 (N-5)	2.65	2.49	3.02	2.10	1.14
	401.0 (N-Q)	0.51	0.38	0.55	0.76	0.51
	403.0 (N-X)	0.15	0.23	0.12	0.15	0.072
	Total content	5.03	4.22	4.86	3.91	2.19
O	531.1 (Quinone)	3.19	4.61	3.22	2.23	1.65
	532.3 (C=O)	5.22	6.21	5.81	5.58	5.00
	533.3 (C-O)	2.58	2.62	2.91	2.57	3.26
	534.2 (C-OH)	0.74	0.49	0.69	0.68	0.32
	535.9 (H_2O)	0.11	0.076	0.091	0.053	0.022
	Total content	11.83	14.00	12.72	11.11	10.26

Table S3. Comparison of the capacitive performance of some nitrogen-enriched porous carbon electrodes in 6 M KOH in the literature.

Item	S_{BET} (m^2 g^{-1})	N (wt. %)	C_g (F g^{-1})	C_g/S_{BET} (μF cm^{-2})	Current density (A g^{-1})	Ref
Nitrogen-doped ordered mesoporous carbon	537	13.10	227	42.3	0.2	1
Nitrogen-doped graphic carbon nanocages	1001	-	248	24.8	1.0	2
Nitrogen-doped porous nanofibers	562.51	7.22	202	35.9	1.0	3
Nitrogen-enriched carbon nanowires	641	7.04	327	51.0	0.1	4
Nitrogen-containing hydrothermal carbon	571	4.4	220	38.5	0.1	5
Hierarchical nitrogen-doped porous carbon	2149.9	2.04	198	9.2	1.0	6
Nitrogen-doped porous graphitic carbon	1027	7.72	293	28.5	1.0	7
Nitrogen-rich “brick-and-mortar” carbon	957	6.6	361	37.7	0.5	8
Poly(benzoxazine-co-resol)-based hierarchically porous carbon	376	0.53	247	66	1.0	9
NPC-2	2036.3	4.21	362.4	17.8	1.0	This work

Table S4 Comparison of CO_2 capture performance of NPC-1 and some nitrogen-containing porous carbons as CO_2 adsorbents at 1 bat and 25°C.

Adsorbents	S_{BET} (m^2 g^{-1})	N (wt. %)	CO_2 uptake (mmol g^{-1})	CO_2 / N_2 selectivity (25°C)	CO_2 adsorption energy Q_{st} (kJ mol^{-1})	Reference
Microporous carbons from dialdehyde and diamine	1881	0.36	2.86	47	18-33	10
N-doped zeolite Y templated carbon	1685	4.0	2.36	-	30-40	11
Nitrogen enriched porous carbons from melamine-formaldehyde resins	490	0.32	2.25	-	-	12
Nitrogen-doped porous carbon monolith	467	1.92	3.1	10.1	-	13
Chitosan derived nitrogen-doped microporous carbons	1381	4.59	3.9	21	22.7-30.4	14
N-doped carbon from polypyrrole	1700	10.14	3.9	5.3	18.9-31.5	15
N-doped porous carbon	1979	4.32	4.30	30	-	16
NPC-1 derived from polybenzoxazine	1254.9	5.32	3.95	32.0	19-51	This work

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