Electronic supplementary information

A general strategy to synthesize high-level N-doped porous carbons *via* Schiff-base chemistry for supercapacitors

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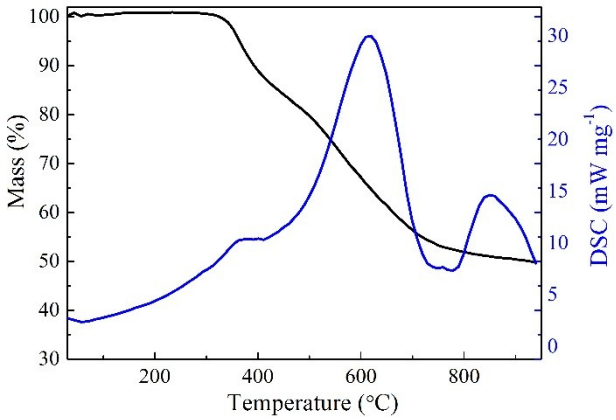


Fig. S1 TGA analysis of Schiff-base polymer spheres in nitrogen atmosphere.

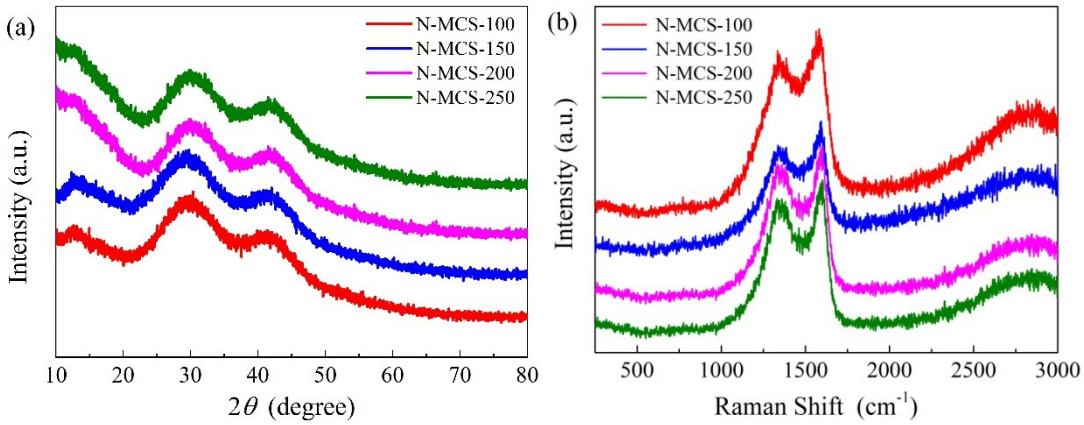


Fig. S2 XRD patterns (a) and Raman spectra (b) of N-MCSs.

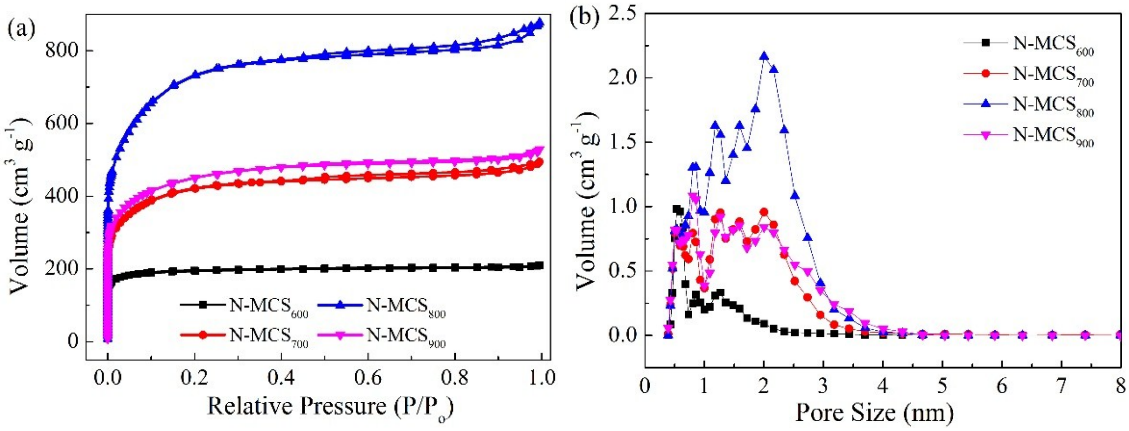


Fig. S3 N_2 adsorption/desorption isotherms (a) and pore size distribution curves of N-MCS$_X$ (b).

Table S1. Pore structure parameters of N-MCS$_X$.

Samples	S_{BET} (m^2 g^{-1})	$S_{micropore}$ (m^2 g^{-1})	$P_{ultramicropore}$ (nm)	$P_{supermicropore}$ (nm)	V_{total} (cm^3 g^{-1})
N-MCS$_{600}$	768	752	0.56	0.86,1.24	0.32
N-MCS$_{700}$	1478	1412	0.57	0.86,1.26	0.76
N-MCS$_{800}$	2431	2316	0.55	0.81,1.19	1.34
N-MCS$_{900}$	1597	1534	0.53	0.80,1.27	0.81

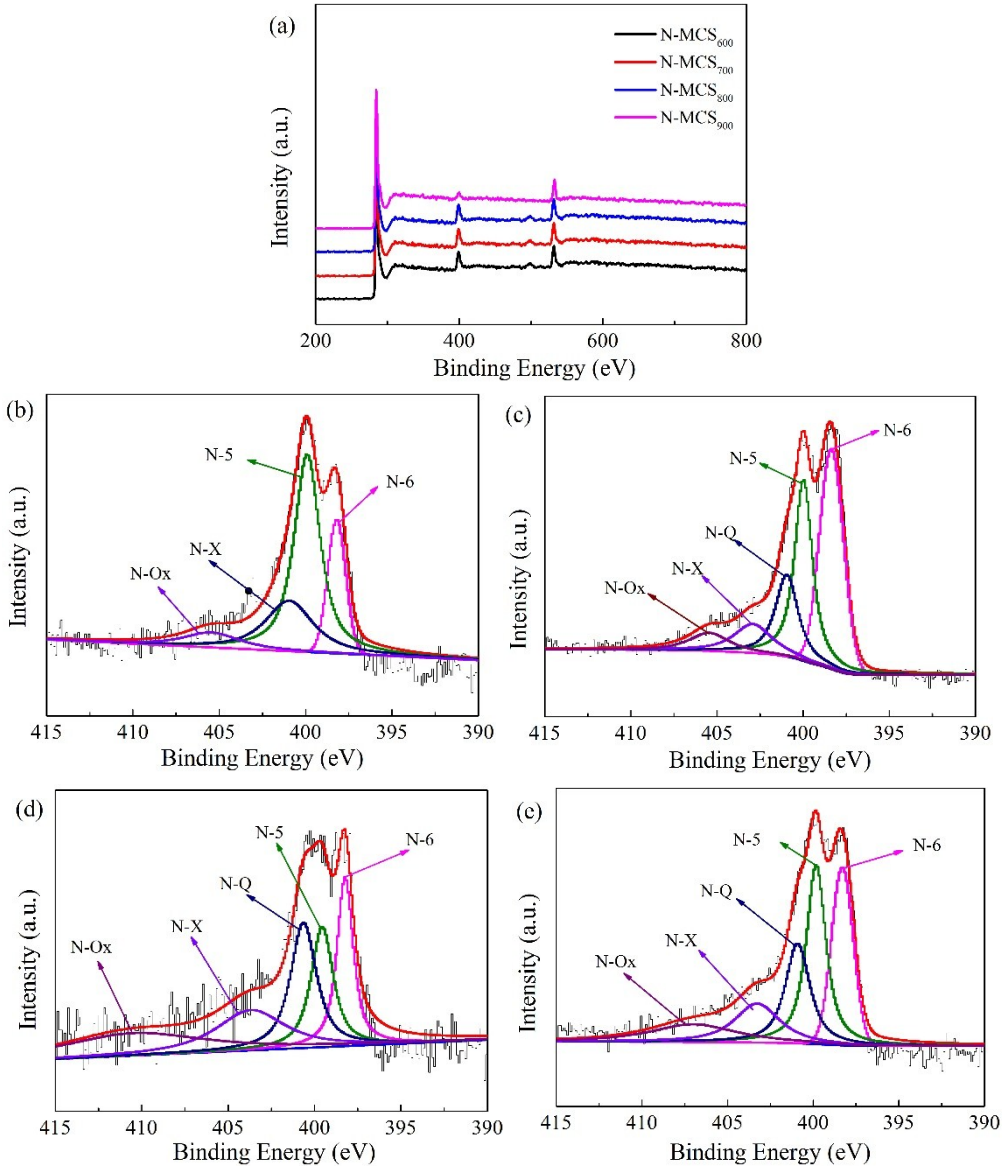


Fig. S4 Wide-scan XPS spectra (a) and fitted high-solution XPS spectra of N 1s for N-MCS$_{600}$ (b), N-MCS$_{700}$ (c), N-MCS$_{800}$ (c), N-MCS$_{900}$ (d).

Table S2. Elemental compositions of C, N, and O, and relative contents of nitrogen species to N 1s in N-MCS$_X$.

Samples	C (at.%)	N (at.%)	O (at.%)	N-6 (%) 398.4eV	N-5(%) 400.5eV	N-Q (%) 401.0 eV	N-X (%) 402.6 eV	N-Ox (%) 405.5 eV
N-MCS$_{600}$	78.60	8.83	12.57	28.27	41.50	22.73	-	7.50
N-MCS$_{700}$	83.40	8.71	7.89	32.25	32.47	19.41	5.80	10.09
N-MCS$_{800}$	89.96	5.10	4.94	28.78	22.01	20.38	12.80	16.02
N-MCS$_{900}$	89.84	3.48	6.68	31.11	27.66	17.33	12.62	11.25

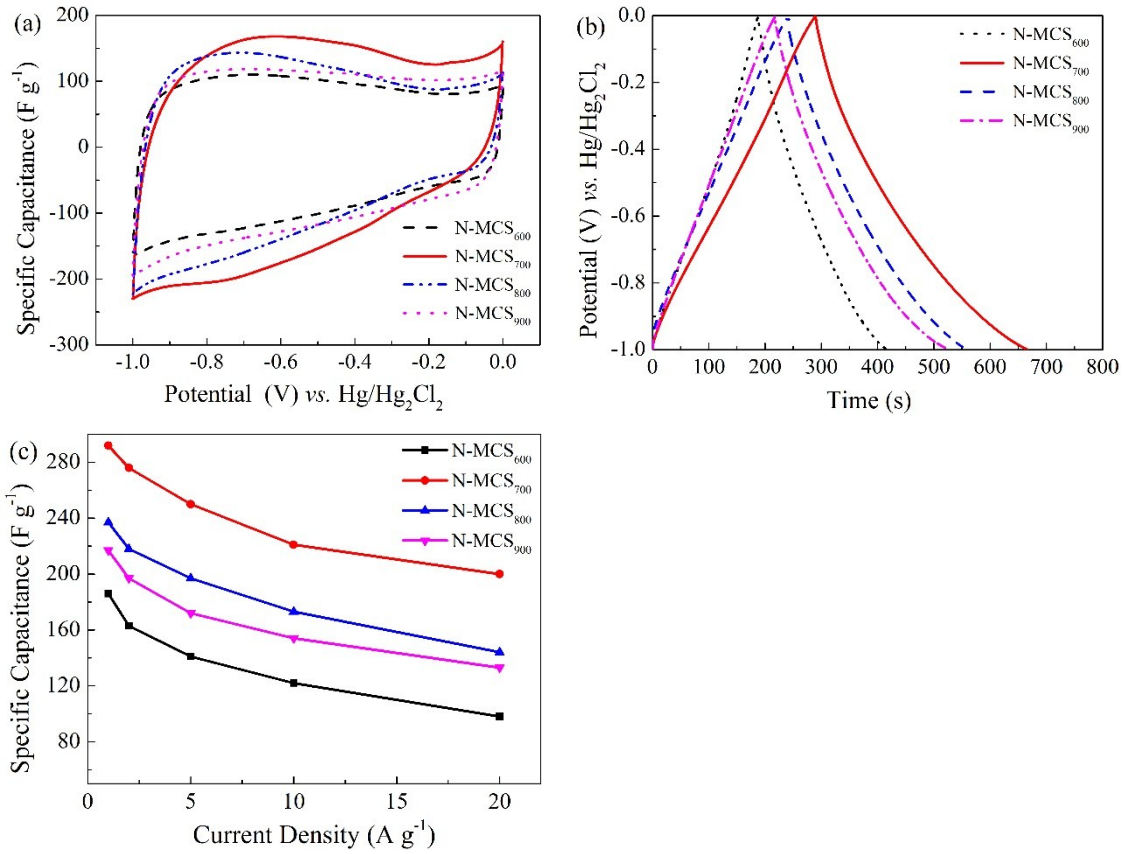


Fig. S5 CV curves (a) at 10 mV s^{-1}, GCD curves at 1.0 A g^{-1} (b) of N-MCS$_X$ electrodes in 6 M KOH electrolyte, and the curves of specific capacitance against the current densities (c).

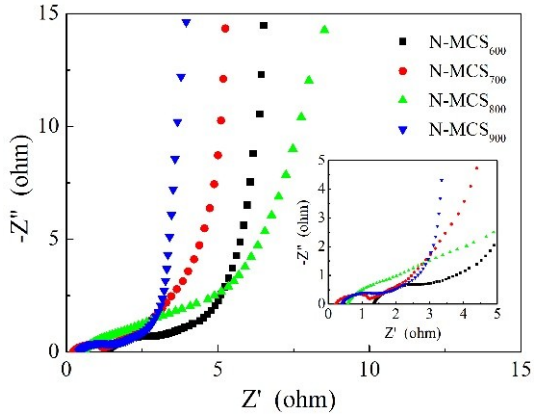


Fig. S6 Nyquist plots of N-MCS$_X$ electrodes with frequency range of 10^5 to 10^{-2} Hz.

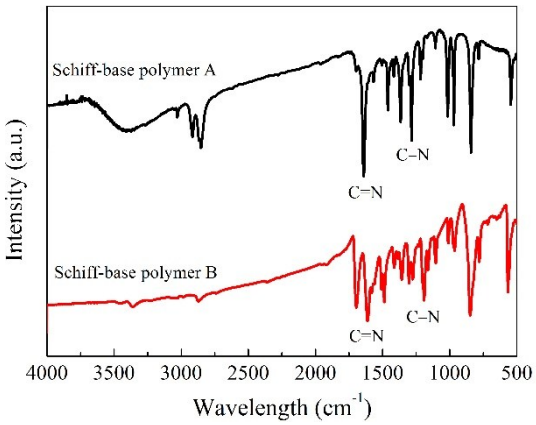
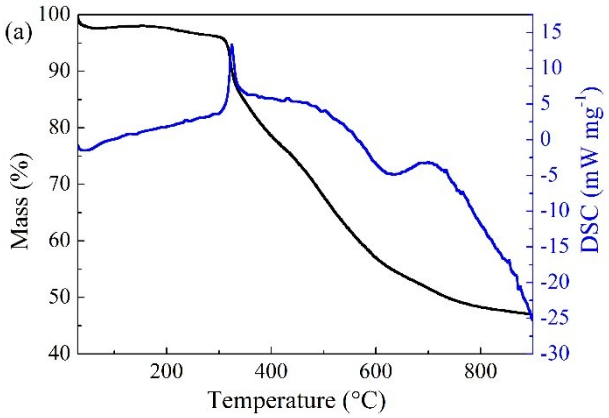


Fig. S7 FT-IR spectra of Schiff-base polymer A and B.



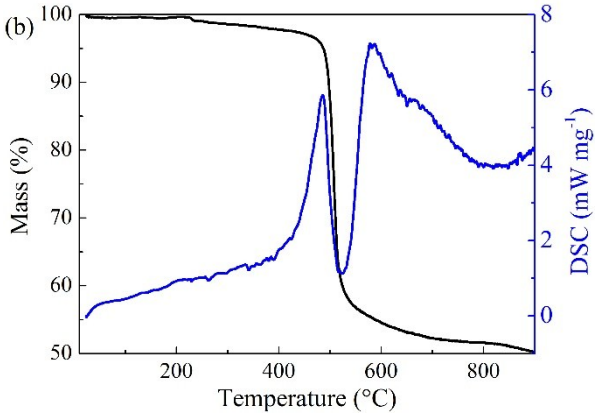


Fig. S8 TGA analysis of Schiff-base polymer A (a) and B (b) in nitrogen atmosphere.

Table S3. Pore structure parameters of N-FPC$_X$ and N-MPC$_X$.

Samples	S_{BET} (m^2 g^{-1})	$S_{micropore}$ (m^2 g^{-1})	Pore size (nm)	V_{total} (cm^3 g^{-1})
N-FPC$_{650}$	857	820	0.81, 1.27	0.47
N-FPC$_{700}$	1387	870	0.71, 1.58, 2.15	1.27
N-FPC$_{750}$	1751	1597	0.82, 0.82, 1.59, 1.99	1.03
N-FPC$_{800}$	2552	1883	0.80, 1.23, 2.75	2.07
N-MPC$_{650}$	640	297	0.60, 1.37,2.72	0.26
N-MPC$_{700}$	740	606	0.68, 0.81, 1.28	0.50
N-MPC$_{750}$	1552	1142	0.50, 0.80, 1.34, 2.72	1.96
N-MPC$_{800}$	974	731	0.68, 0.81, 1.28, 2.72	0.81

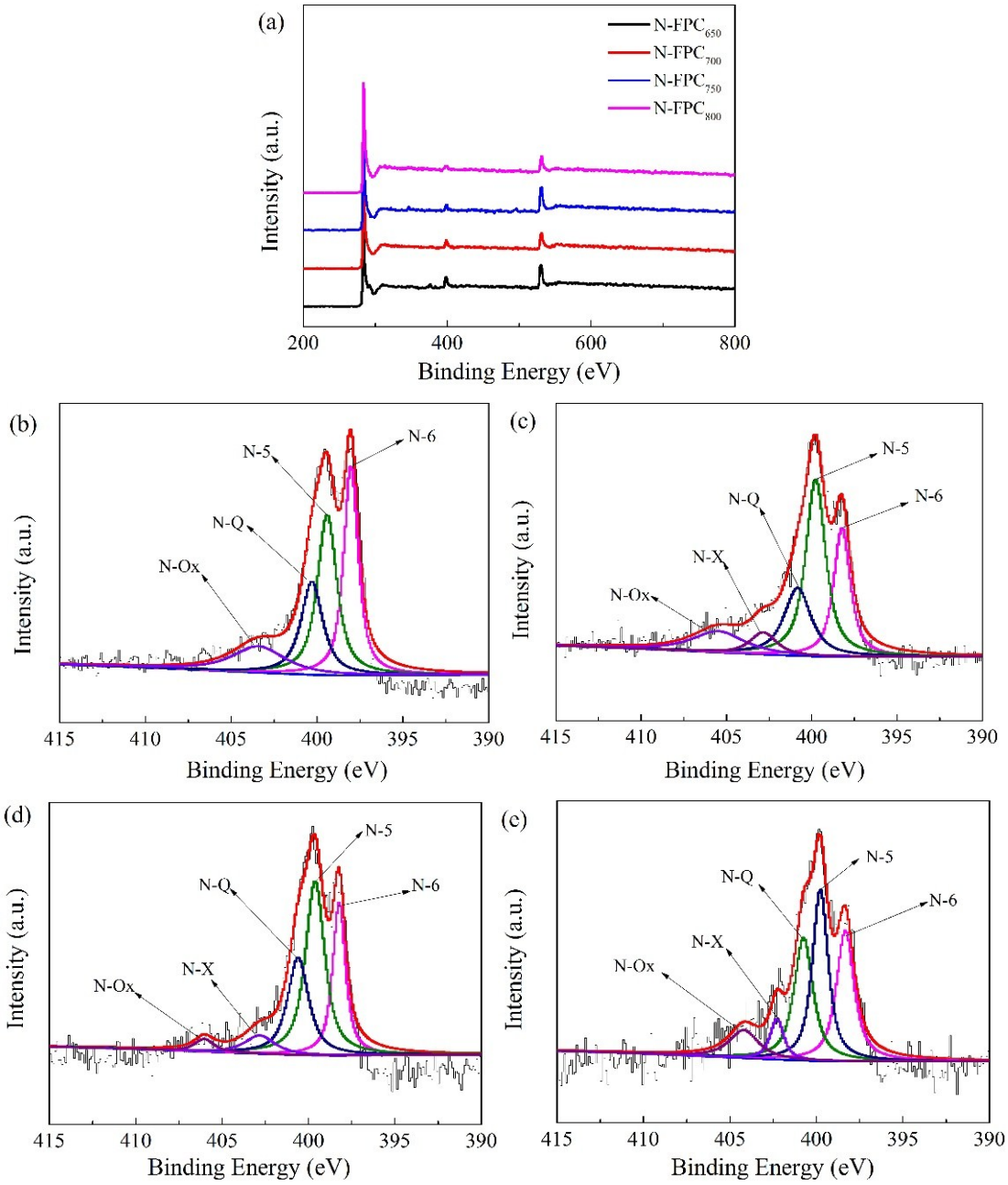


Fig. S9 Wide-scan XPS spectra (a) and fitted high-solution XPS spectra of N 1s for N-FPC$_{650}$ (b), N-FPC$_{700}$ (c), N-FPC$_{750}$ (d), N-FPC$_{800}$ (e).

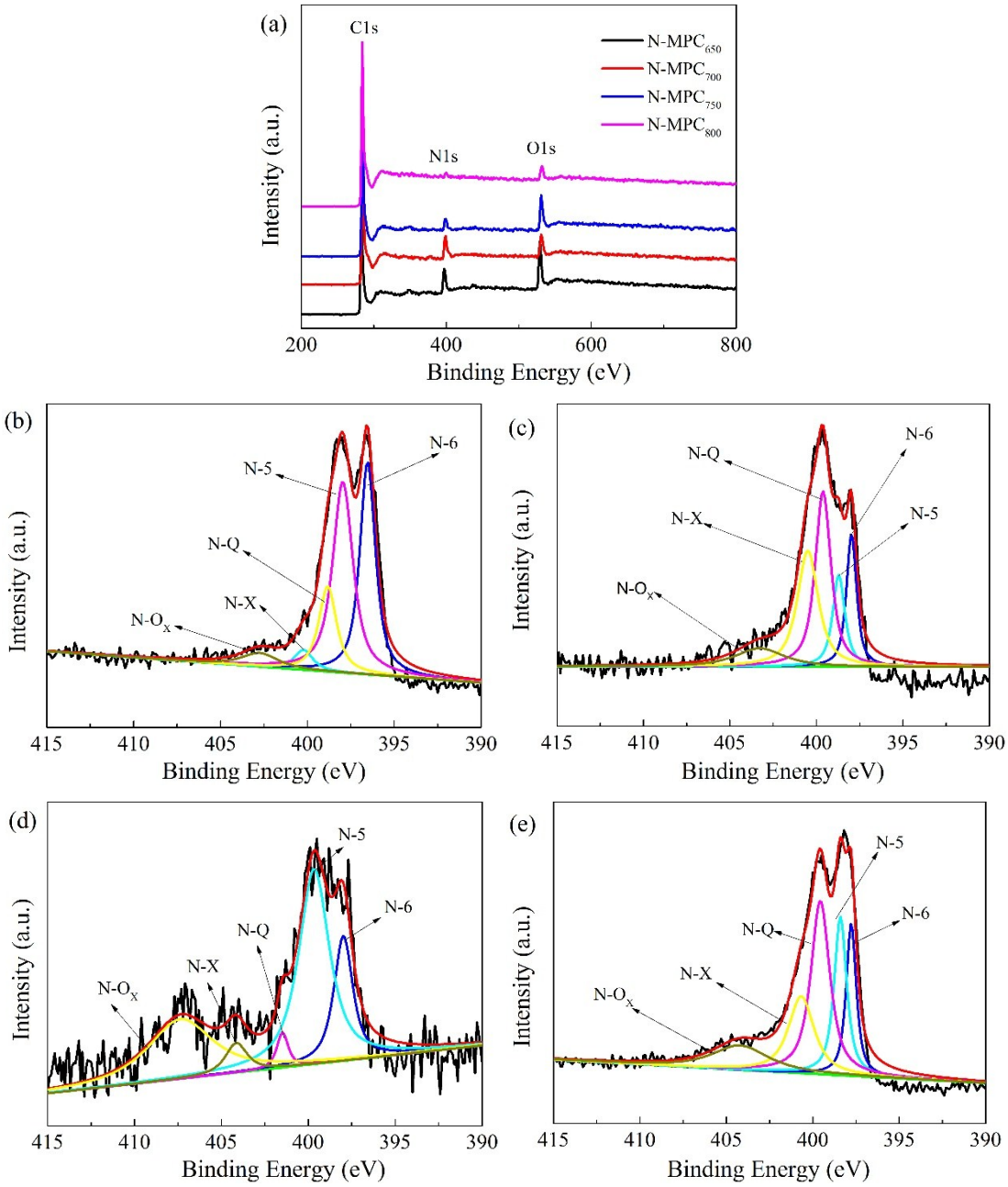


Fig. S10 Wide-scan XPS spectra (a) and fitted high-solution XPS spectra of N 1s for N-MPC$_{650}$ (b), N-MPC$_{700}$ (c), N-MPC$_{750}$ (d), N-MPC$_{800}$ (e).

Table S4. Elemental compositions of C, N, and O, and relative contents of nitrogen species to N 1s in N-FPC$_X$ and N-MPC$_X$.

Samples	C (at.%)	N (at.%)	O (at.%)	N-6 (%) 398.4 eV	N-5 (%) 400.5 eV	N-Q (%) 401.0 eV	N-X (%) 402.6 eV	N-Ox (%) 405.5 eV
N-FPC$_{650}$	79.97	8.12	11.91	31.79	36.94	21.19		10.08
N-FPC$_{700}$	85.67	7.53	6.81	23.34	38.51	19.89	11.90	6.35
N-FPC$_{750}$	81.13	5.56	13.31	24.35	40.87	25.14	6.6	3.0
N-FPC$_{800}$	89.69	3.79	6.51	27.01	26.70	30.65	6.27	9.38
N-MPC$_{650}$	79.36	8.29	12.36	34.66	40.38	19.74		5.2
N-MPC$_{700}$	83.44	7.20	9.36	15.66	32.26	13.25	28.41	10.41
N-MPC$_{750}$	83.22	5.61	11.17	17.78	35.09	29.2	13.01	4.89
N-MPC$_{800}$	92.10	3.96	3.94	17.35	27.46	22.53	22.23	10.41

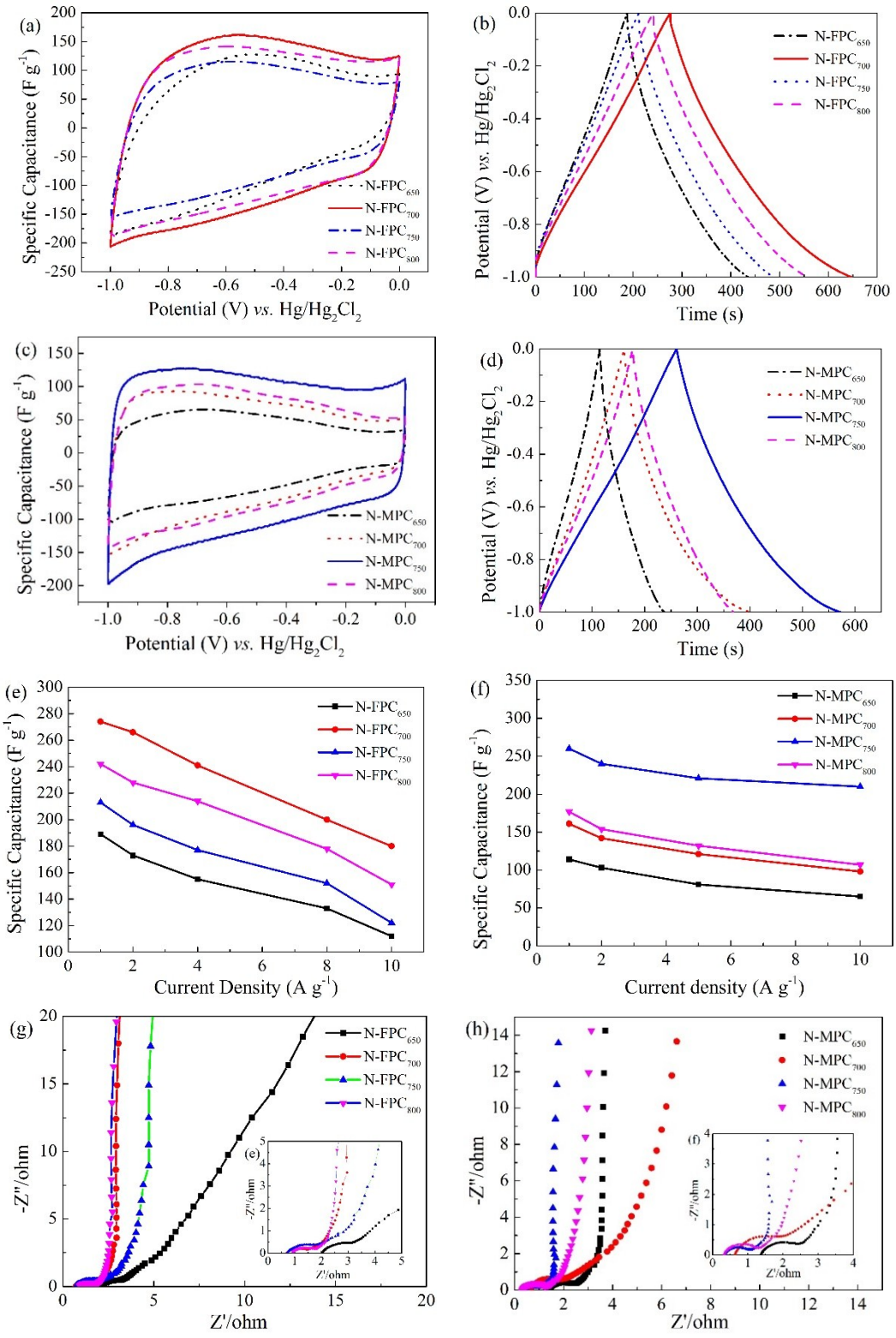


Fig. S11 CV curves at 10 mV s^{-1} (a, c), GCD curves at 1.0 A g^{-1} (b, d), the curves of specific capacitance against the current densities (e, f), and Nyquist plots (g, h) of N-FPC$_X$ (a, b, e, g) and N-MPC$_X$ (c, d, f, h) electrodes in 6 M KOH electrolyte.

Table S5. Specific capacitances of N-FPC$_X$ and N-MPC$_X$ electrodes at 1.0 A g^{-1} in 6 M KOH electrolyte.

Samples	Specific capacitance (F g^{-1})	Samples	Specific capacitance (F g^{-1})
N-FPC$_{650}$	188	N-MPC$_{650}$	115
N-FPC$_{700}$	277	N-MPC$_{700}$	160
N-FPC$_{750}$	238	N-MPC$_{750}$	262
N-FPC$_{800}$	210	N-MPC$_{800}$	178

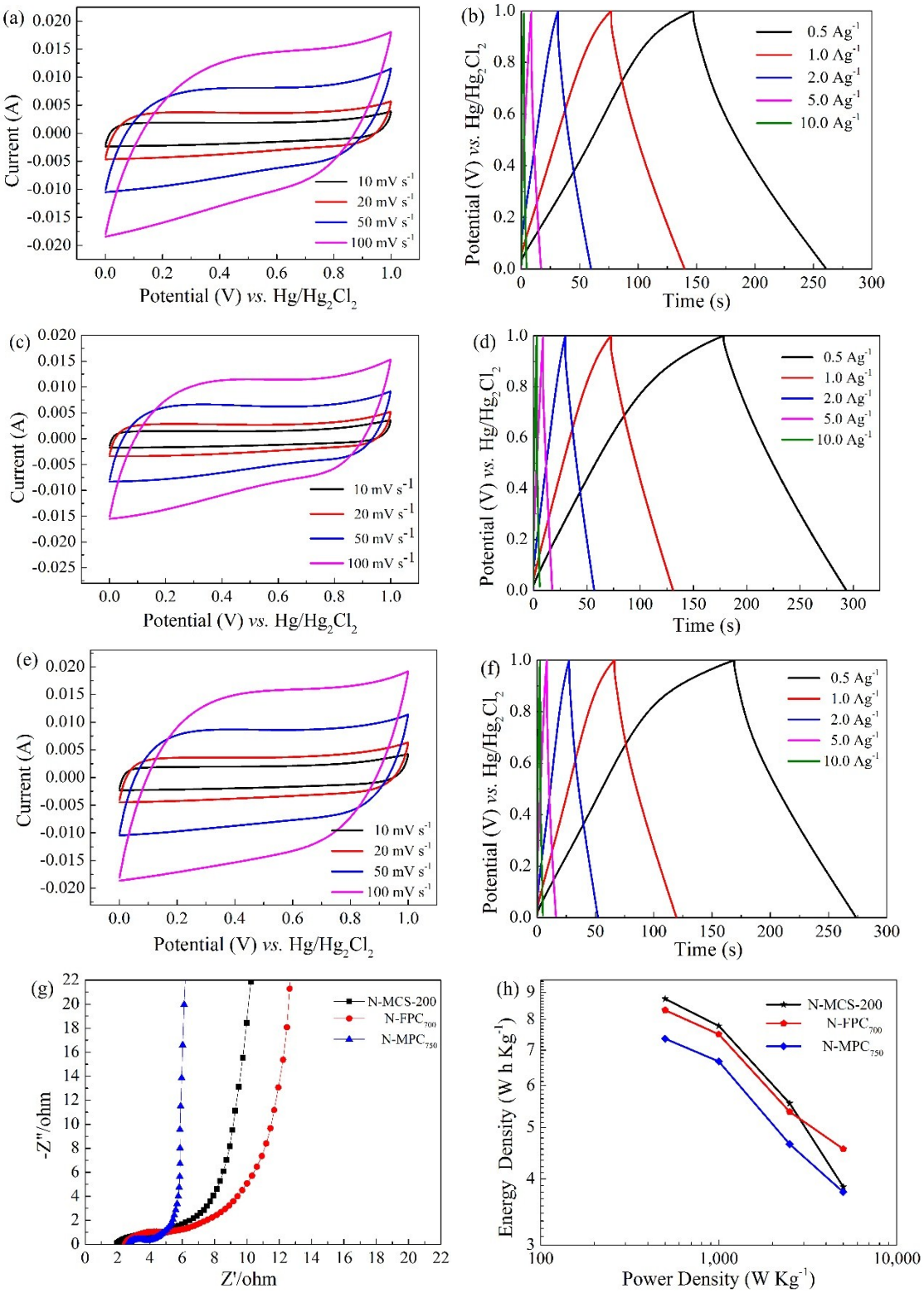


Fig. S12 CV curves at different scan rates (a, c, e), GCD curves at different current densities (b, d, f), Nyquist plots with frequency range of 10^5 to 10^{-2} Hz (g), and Ragone plots (h) of N-MCS-200 (a, b), N-FPC$_{700}$ (c, d) and N-MPC$_{750}$ (e, f) electrodes using 6 M KOH electrolyte in a two-electrode cell.