Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting information for

Synthesis of Ultrahigh-surface-area Nitrogen-doped Porous Carbon Materials from Carboxymethyl Cellulose based Protic Polyanion Ionic Liquids for High Performance Supercapacitors

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1. Figures

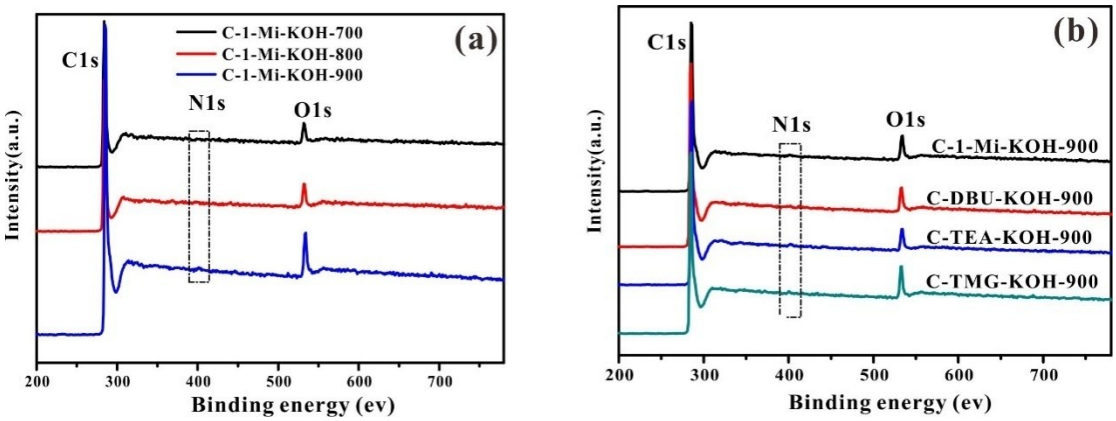

Figure S1 Wide-scan XPS spectra of (a) C-1-Mi-KOH-T carbon samples and (b) C-X-KOH-900 carbon samples

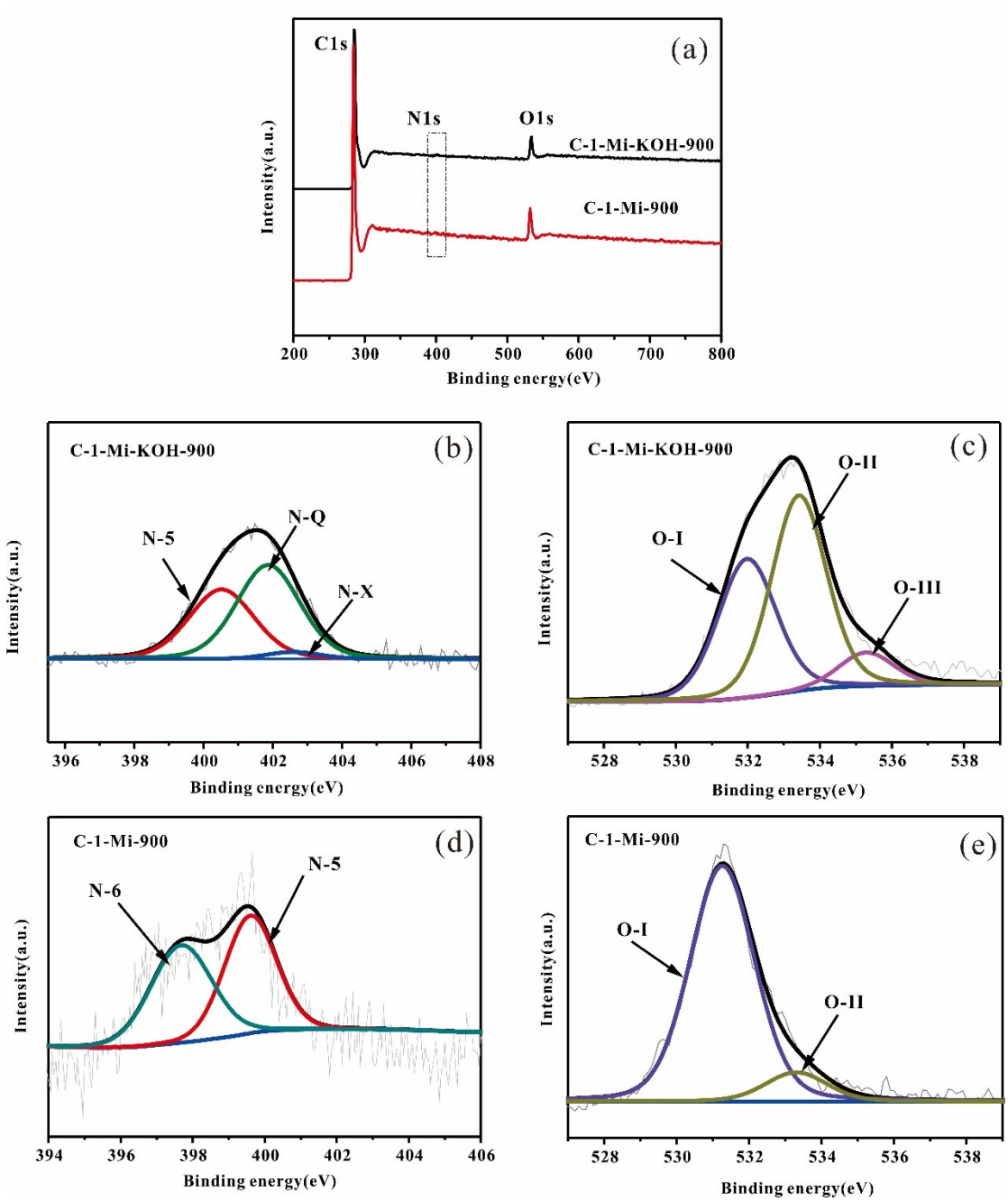

Figure S2 (a) Wide-scan XPS spectra of C-1-Mi-KOH-900, C-1-Mi-900; High-resolution XPS N1s spectra of (b) C-1-Mi-KOH-900, (d) C-1-Mi-900 and High-resolution XPS O1s spectra of (c) C-1-Mi-KOH-900 and (e) C-1-Mi-900

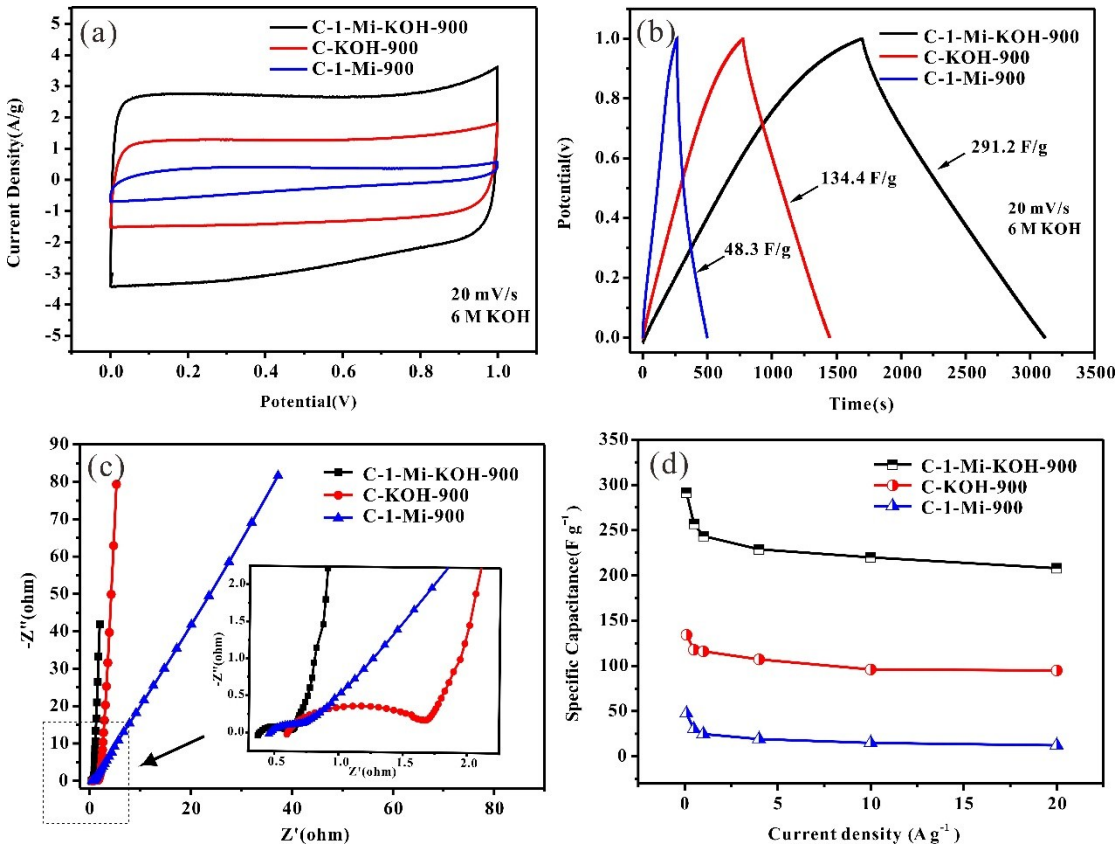

Figure S3 Electrochemical performance of C-1-Mi-KOH-900, C-1-Mi-900 and C-KOH-900 in a two-electrode cell with 6 M KOH as the electrolyte:

(a) CV curves at 20mV/s scan rates, (b) GCD curves tested at 0.1 A/g, (c) Nyquist plots (inset shows locally enlarged Nyquist plots in the high frequency region), (d) The specific capacitances at various current densities.

2. Tables

Table S1 Textural parameters of all samples

Sample	BET surface area ($m^2 g^{-1}$)	Total pore volume ($cm^3 g^{-1}$)	Average pore dia.（nm）	Cg ($F g^{-1}$)
C-1-Mi-KOH-900	3656.74	2.28	2.49	291.2
C-1-Mi-900	21.79	0.037	6.83	47.3
C-KOH-900	2965.81	1.68	2.26	134.4
C-1-Mi-KOH-800	3361.95	1.71	2.01	254.6
C-1-Mi-KOH-700	3154.93	1.57	1.99	232.2
C-TMG-KOH-900	3431.19	2.22	1.96	276.2
C-DBU-KOH-900	3116.63	1.98	1.73	263.2
C-TEA-KOH-900	2963.87	1.71	2.21	253.2

Table S2 Chemical composition of the prepared carbon samples obtained by XPS

Samples	C (at%)	N (at%)	O (at%)	N1s				O1s		
				N-6	N-5	N-Q	N-X	O-I	O-II	O-III
1	70.65	3.23	20.13	49.37	50.63	-	-	89.44	10.56	-
2	93.01	1.11	5.88	-	40.55	53.42	6.03	34.31	52.37	13.32
3	92.28	1.07	6.65	-	31.13	54.95	13.91	40	50.3	9.7
4	81.87	3.58	14.55	-	21.15	63.79	15.06	56.58	36.08	7.34
5	92.5	0.89	6.61	-	21.72	53.28	24.99	28.35	50.45	21.2
6	93.35	1.21	5.44	-	25.92	40.15	33.93	25.59	58.28	16.13
7	94.17	1.04	4.79	-	23.81	23.74	52.45	15.74	52.9	31.36

Note: 1: C-1-Mi-900, 2: C-1-Mi-KOH-900, 3: C-1-Mi-KOH-800, 4: C-1-Mi-KOH-700, 5: C-DBU-KOH-900, 6: C-TEA-KOH-900, 7: C-TMG-KOH-900.

Table S3 Comparison of the supercapacitance performance in this work and other literatures

Electrode	Electrolyte	Current density ($A\ g^{-1}$)	Specific capacitance ($F\ g^{-1}$)	Energy density ($Wh\ kg^{-1}$)	Power density ($W\ kg^{-1}$)	Refs
HAC-WS	6 M KOH	1	225	7.8	251	1
P-3DHPC-0.2	6 M KOH	0.3	367	12.7	75	2
HPCSLS-700-1	7 M KOH	0.05	247	8.6	14.3	3
HNPCs-900	6 M KOH	0.5	289	10.03	126	4
N, O-HPC-850	1 M Na_2SO_4	0.2	82.1	9.7	43.8	5
aCA-3 h	6 M KOH	0.5	152.6	5.3	125	6
carbon-N-1:20	6 M KOH	1	156.7	5.44	251	7
TC	6 M KOH	0.5	286.6	9.95	124	8
AC850	6 M KOH	0.1	147	5.11	25	9
Activated carbon	6 M KOH	0.5	195	10	1000	10
Carbon nanosheets	1 M KOH	0.5	208	14.7	4500	11
Porous Carbon Nanofibers	0.5 M H_2SO_4	0.5	80	3.4	900	12
C-1-Mi-KOH-900	6 M KOH	0.1	291.2	10.11	26	This work

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