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Supporting Information

Oxygen-rich hierarchical porous carbon nanosheets derived from KOH/KNO_3 co-activation treatment of soybean straw for high-performance supercapacitor

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1. Figures

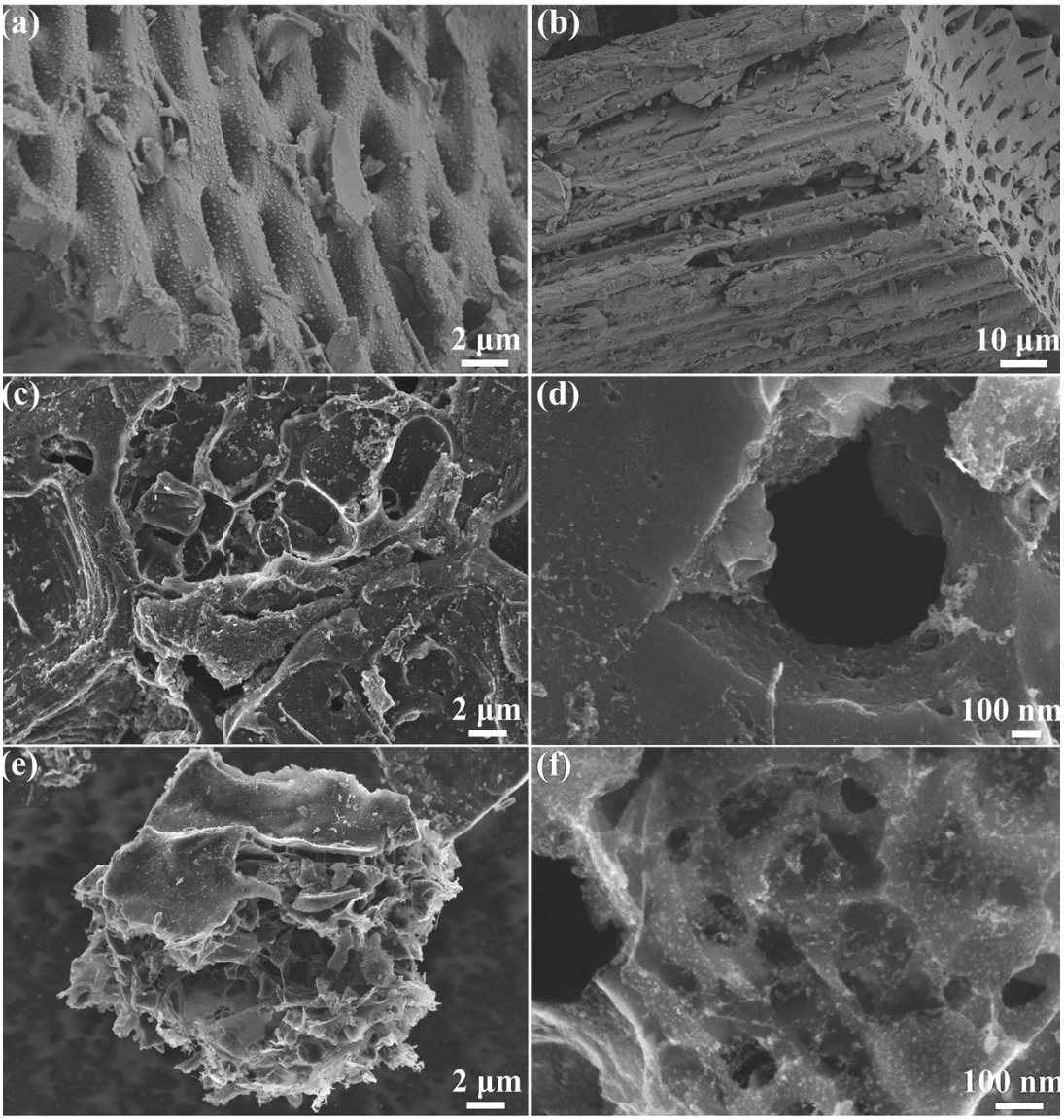

Figure S1 (a) and (b) the FE-SEM images of the carbonated sample SSC; (c) and (d) the FE-SEM images of the KOH/KNO_3 co-activated sample SSC2-0.5; (e) and (f) the FE-SEM images of the KOH/KNO_3 co-activated sample SSC2-0.7.

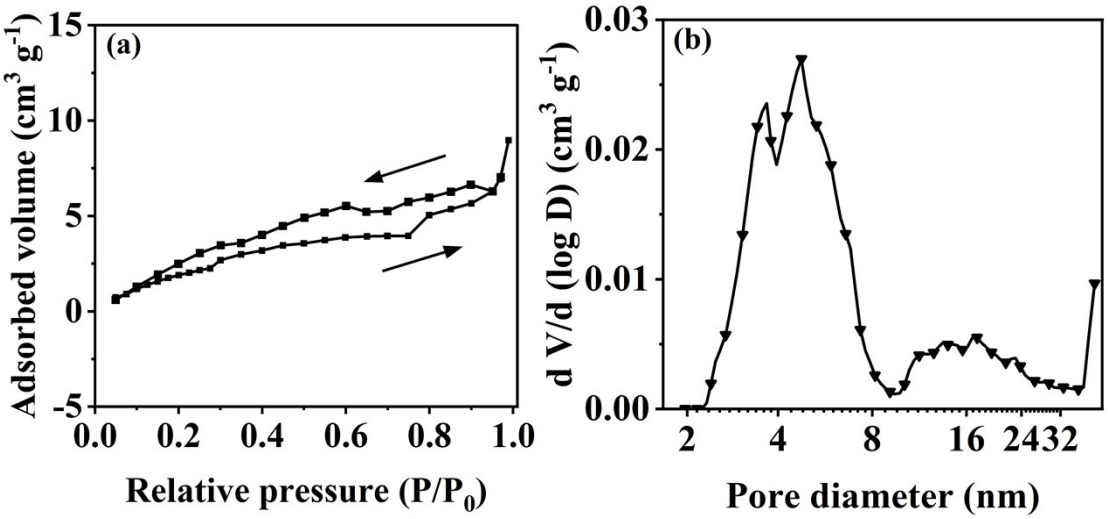

Figure S2 (a) N_2 adsorption-desorption isotherm of the carbonized sample SSC; (b) Pore size distribution of the carbonized sample SSC.

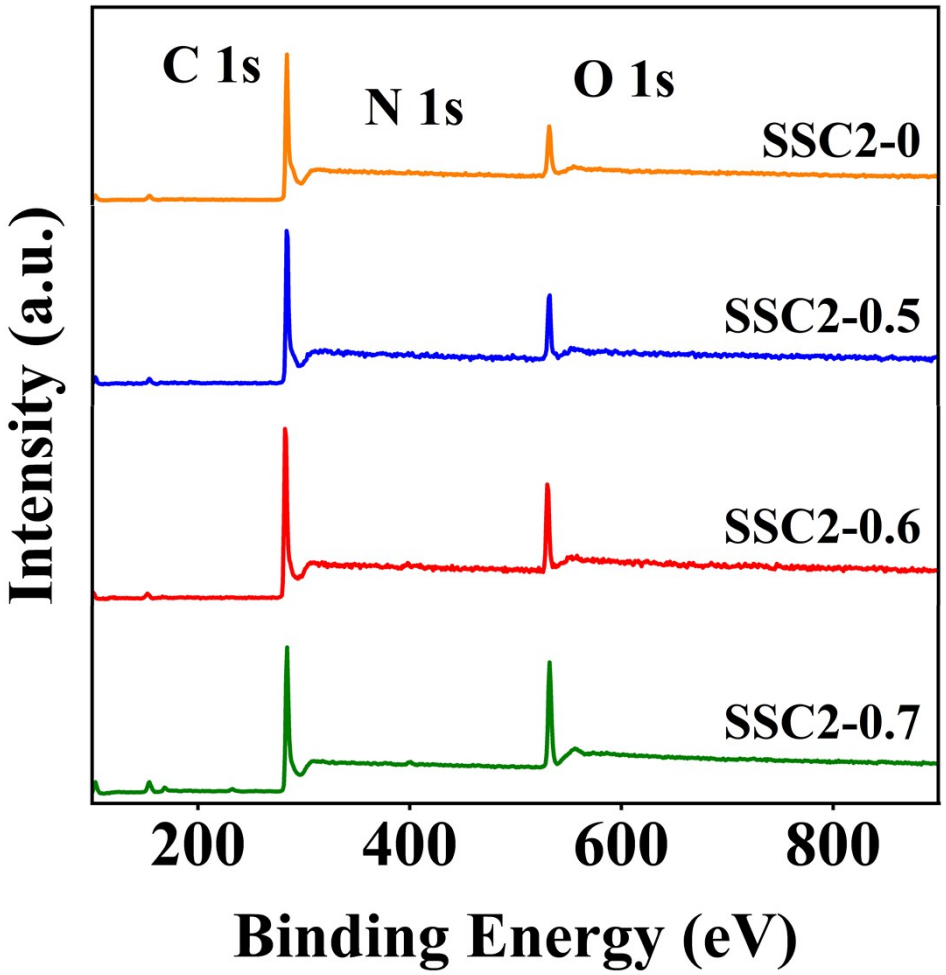

Figure S3 XPS spectra of the samples.

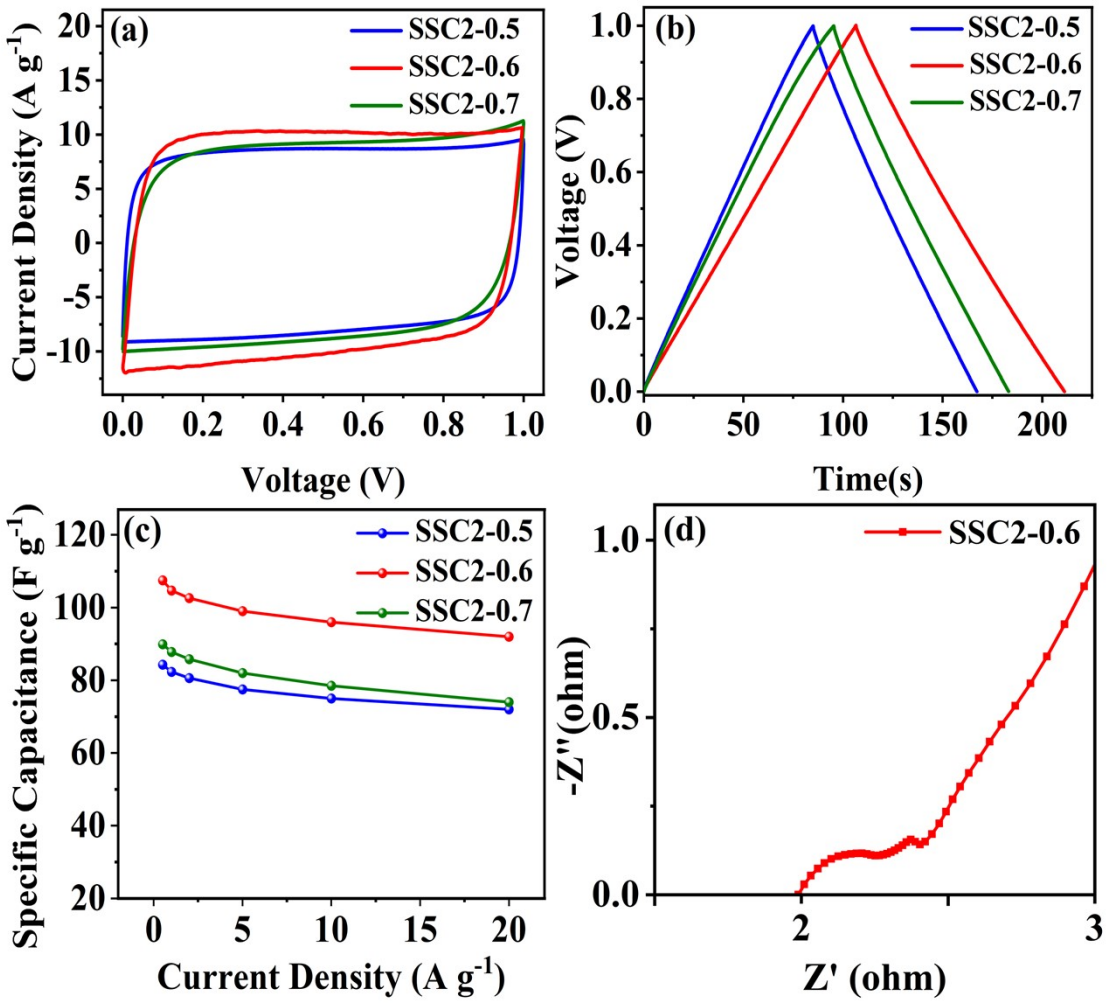

Figure S4 Capacitive properties of the symmetric supercapacitor: (a) CV curves at 100 mV s^{-1}; (b) GCD curves at 1 A g^{-1}; (c) the specific capacitances at different current density; (d) the enlarged plot of Figure 8 (d) at the high-frequency region.

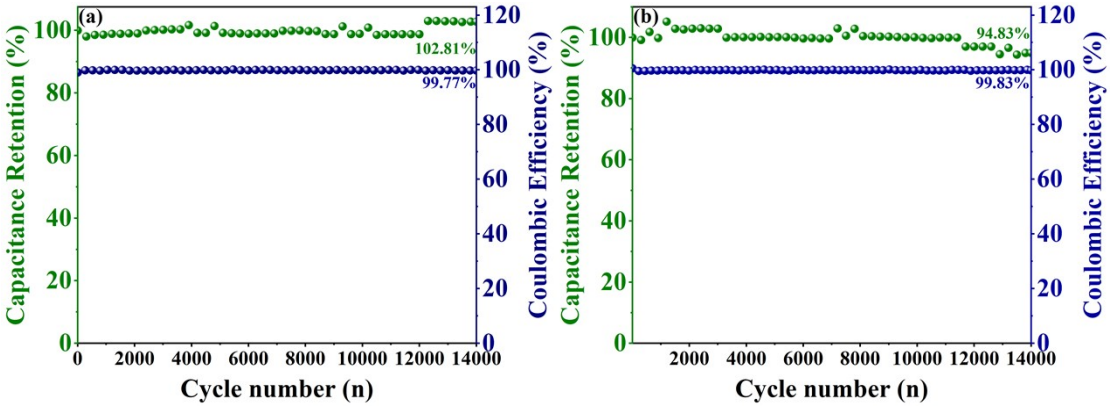

Figure S5 the stability of the capacitance retention and the coulombic efficiency of the samples with 14000 cycles at a current density of 10 A s^{-1}: (a) SSC2-0.5; (b) SSC2-0.7.

2. Tables

Table S1 The weight yield of the samples

Samples	before carbonization（g）	after carbonization（g）	Yield（%）	before activation（g）	after activation（g）	Yield（%）	Total yield（%）
SSC	10	2.7	27	/	/	/	/
SSC2-0	/	/	/	2	1.24	62	16.74
SSC2-0.5	/	/	/	2	1.08	54	14.58
SSC2-0.6	/	/	/	2	1.00	50	13.50
SSC2-0.7	/	/	/	2	0.96	48	12.96

Table S2 the elemental contents of the samples measured by the XPS.

sample	C (at.%)	O (at.%)	N (at.%)	the contents of carbon-containing functional groups (at.%)				the contents of oxygen-containing functional groups (at.%)			
				sp^2-C	sp^3-C	C=O	O-C=O	C=O	C-OH	O-C=O	N-O
SSC2-0	86.98	11.83	1.19	53.80	19.40	8.36	5.42	0.57	9.27	1.16	0.83
SSC2-0.5	83.76	14.01	2.23	48.80	20.27	9.03	5.66	0.59	8.18	4.34	0.90
SSC2-0.6	80.88	16.77	2.35	42.31	20.86	11.70	6.01	0.97	7.23	7.38	1.19
SSC2-0.7	74.89	23.33	1.78	37.74	18.80	12.11	6.24	1.53	5.79	12.65	3.36

Table S3 The resistance values of the two-electrode system based on the equivalent circuit model.

samples	Resistence (Ω)		
	R_s	R_{ct}	Z_w
SSC2-0	4.57	10.73	5.03
SSC2-0.5	3.19	4.13	3.98
SSC2-0.6	3.63	3.40	2.14
SSC2-0.7	3.25	3.84	2.44

Table S4 Energy density vs. power density of the symmetric supercapacitor fabricated with the SSC2-0.6 electrode.

Current density (A g^{-1})	0.5	1	2	5	10	20
Energy density (Wh kg^{-1})	14.89	14.49	14.14	13.50	12.92	11.90
Power density (W kg^{-1})	249.44	498.22	992.28	2454.55	4845.00	9313.04