

Supporting information

Interface graphitized/amorphous control of biomass-derived carbon microspheres for symmetric supercapacitor

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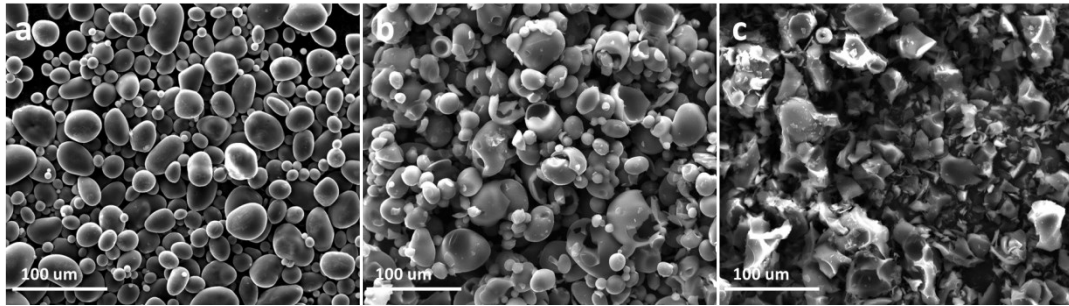


Fig. S1 SEM images of SC samples obtained at different heating rates of 0.2 °C/min (a), 0.5 °C/min (b), and 1 °C/min (c).

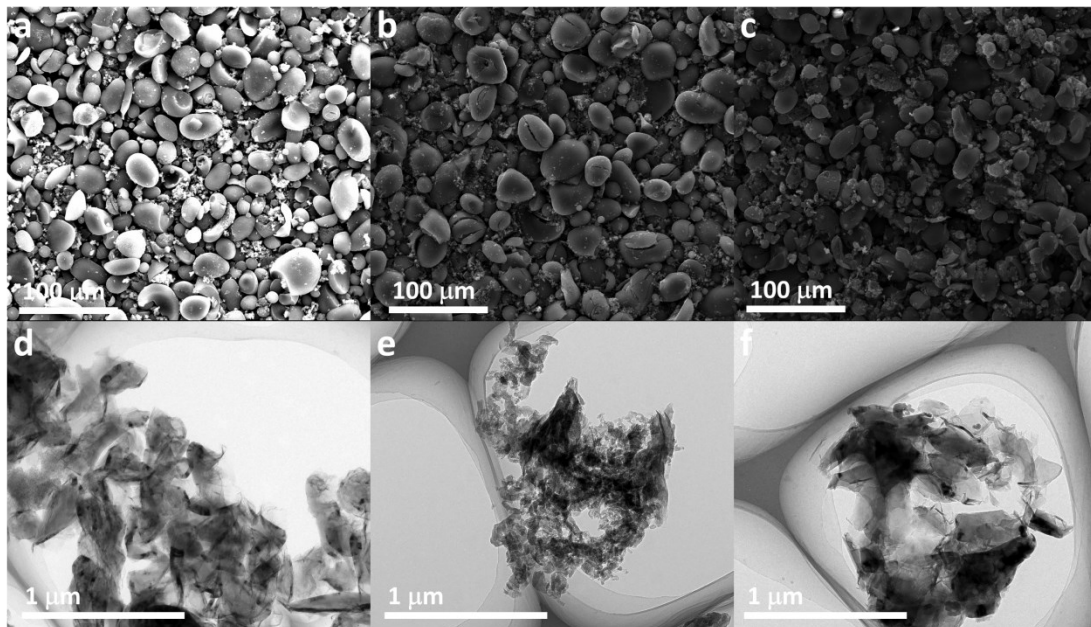


Fig.S2 SEM and TEM images of (a,d) GASC-Fe, (b,e) GASC-Co, and (c,f) GASC-Ni.

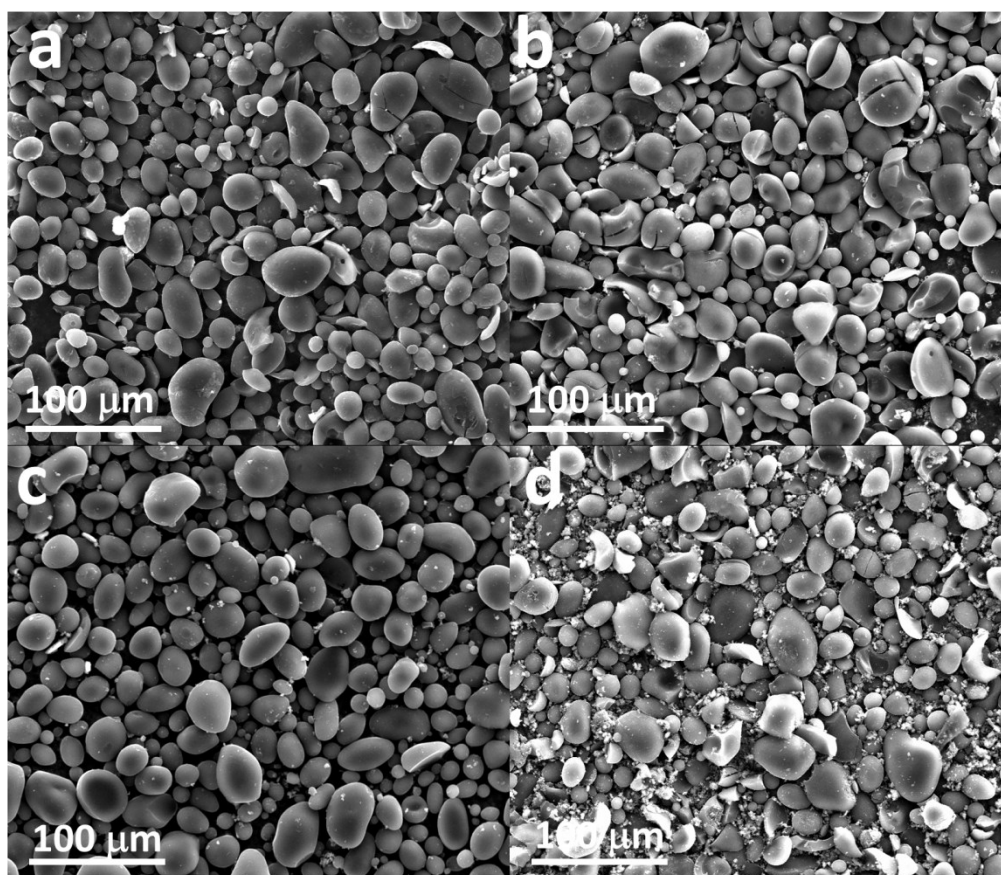


Fig.S3 SEM images of (a) AC, (b) GASC05, (c) GASC10, and (d) GASC15.

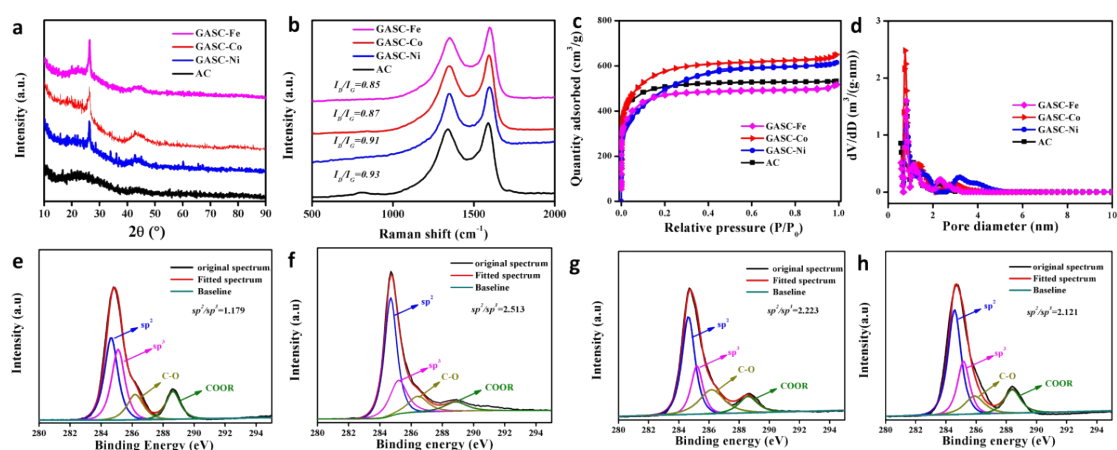


Fig. S4 (a) XRD patterns, (b) Raman spectra, (c) N₂ adsorption–desorption isotherms, (d) pore size distributions of AC, GASC-Fe, GASC-Co, and GASC-Ni; (e-h) High-resolution C 1s spectrum of AC (e), GASC-Fe (f), GASC-Co (g), and GASC-Ni (h).

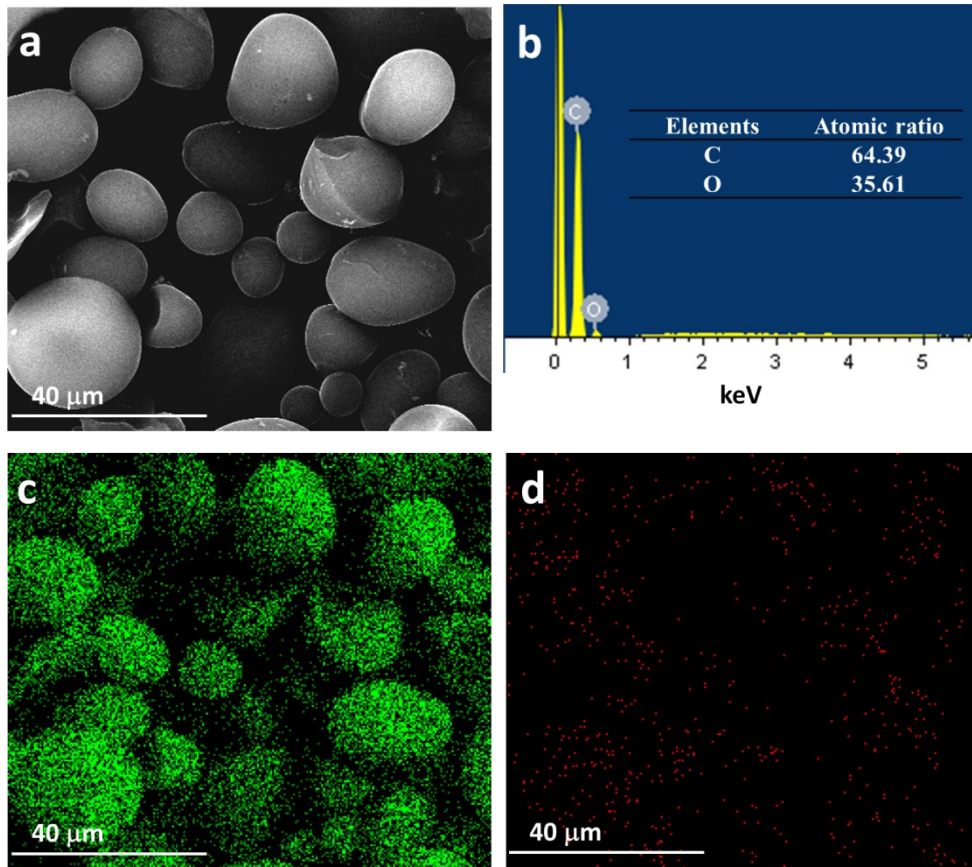


Fig.S5 (a) SEM image, (b) EDS spectra, and (c, d) element mapping distributions of AC.

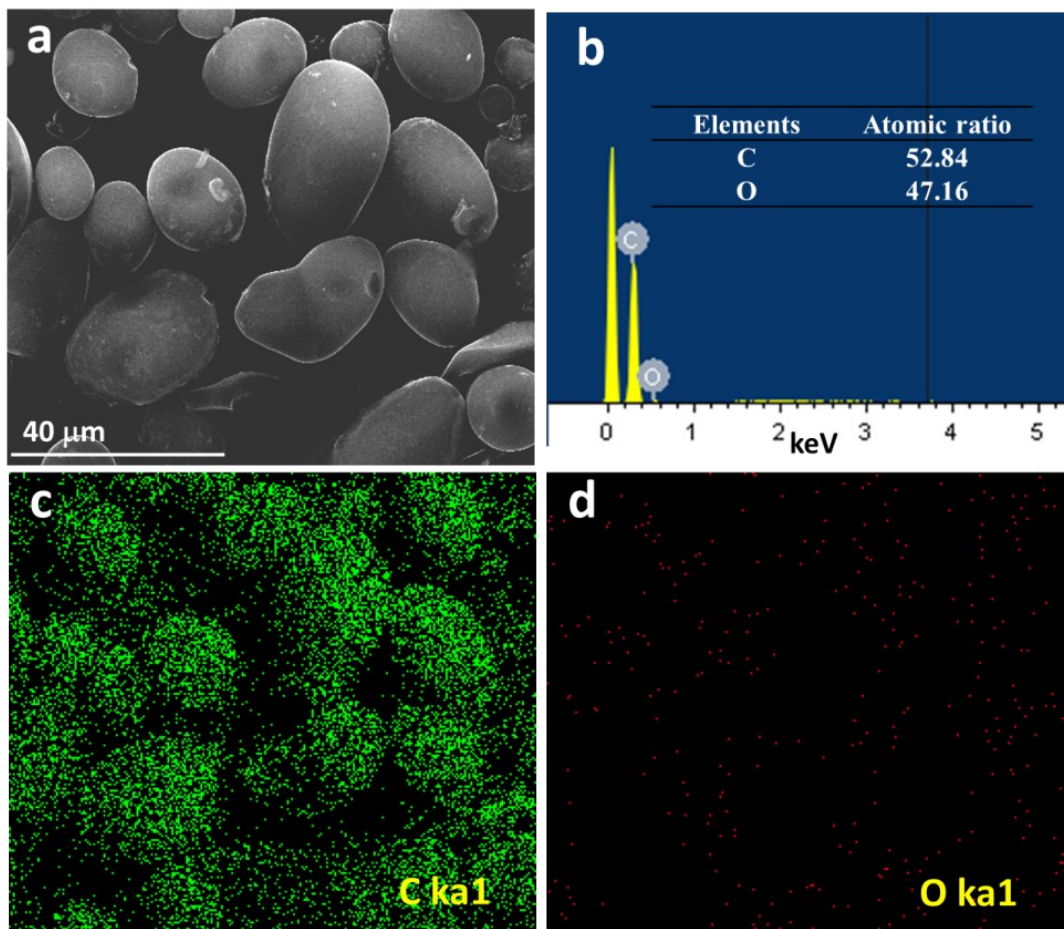


Fig.S6 (a) SEM image, (b) EDX spectra, and (c, d) element mapping distributions of GASC10.

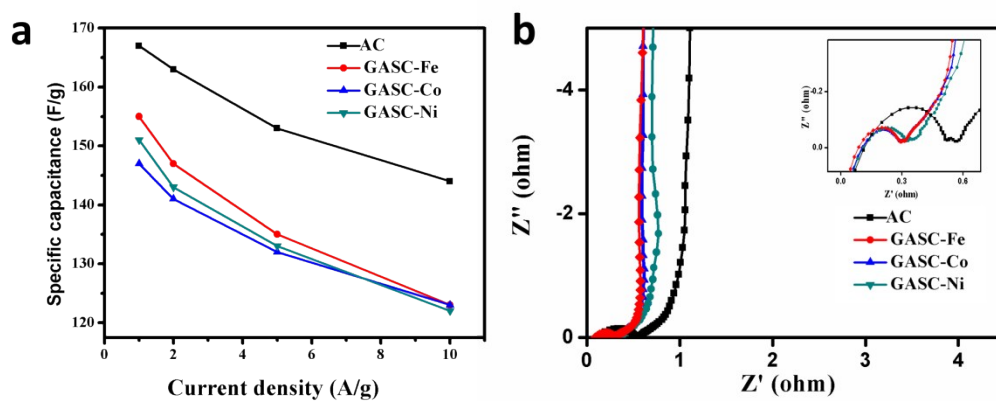


Fig. S7 (a) Specific capacitances at various current densities and (b) Nyquist plots of AC, GASC-Fe, GASC-Co, and GASC-Ni SSCs.

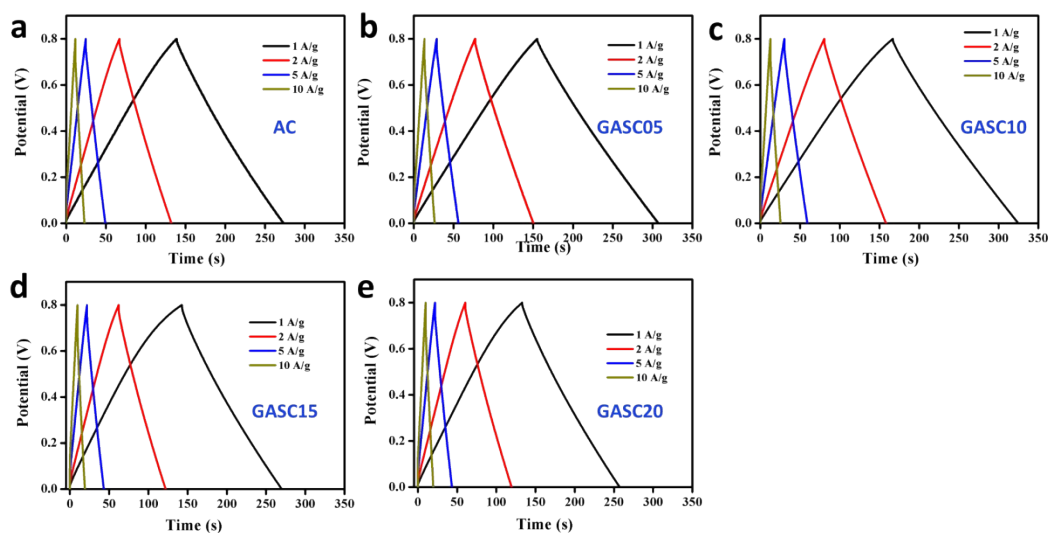


Fig. S8 GCD curves of AC, GASC05, GASC10, GASC15, and GASC20 SSCs at different current densities.

Table S1 XRD, R_{man}, XPS, resistivity, and N₂ adsorption-desorption measurements results of different samples.

Samples	d_{002} (Å)	I_D/I_G	sp^2/sp^3	Resistivity (Ω·cm)	S_{BET} (m ² /g)	V_{tot} (cm ³ /g)	V_{mic} (cm ³ /g)	V_{mes} (cm ³ /g)
AC	-	0.93	1.179	1.536	1912	0.82	0.76	0.06
GASC-Fe	3.365	0.85	2.513	0.131	1744	0.80	0.72	0.08
GASC-Co	3.479	0.87	2.223	0.138	2117	1.01	0.91	0.10
GASC-Ni	3.482	0.91	2.121	0.140	1775	0.95	0.87	0.08
GASC05	-	0.92	1.573	0.331	1954	0.95	0.79	0.16
GASC10	3.378	0.91	2.271	0.187	2369	1.08	0.97	0.11
GASC15	3.370	0.90	2.366	0.165	2119	1.10	1.01	0.09