Supporting Information

Biowaste Derived 3D Honeycomb-Like Porous Carbon with Binary-Heteroatom Doping for High Performance Flexible Solid-State Supercapacitors

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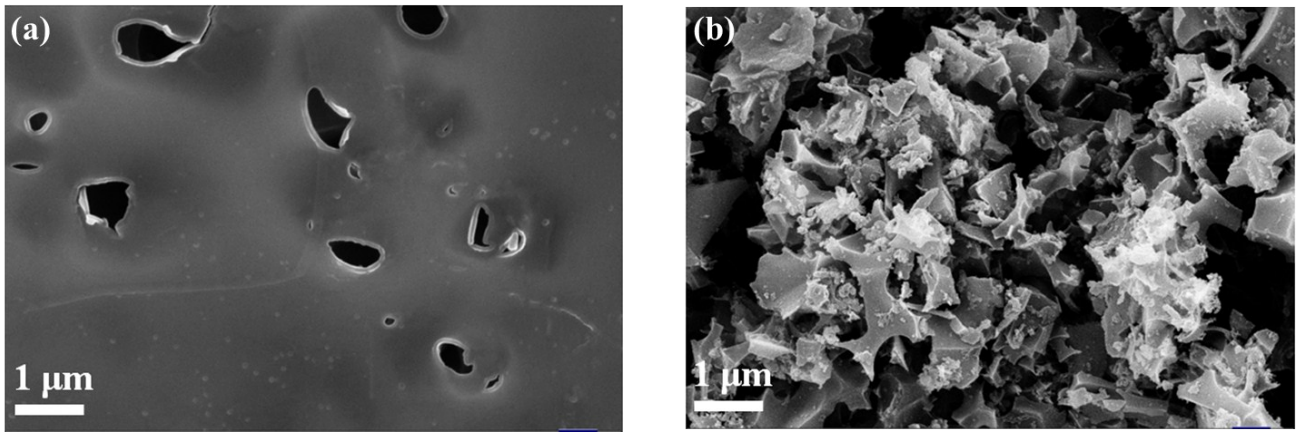

Fig. S1 SEM images of the a) ACS1:1 and b) ACS4:1.

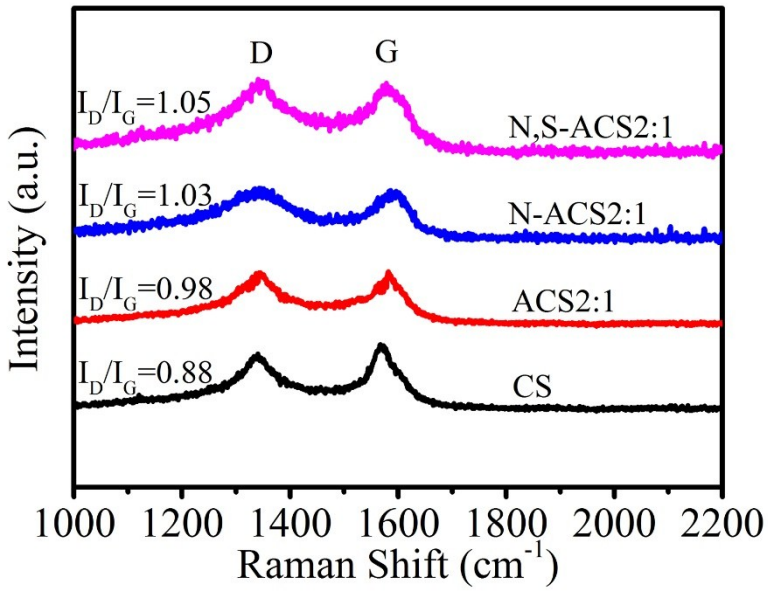

Fig. S2 Raman spectra of the CS, ACS2:1, N-ACS2:1 and N,S-ACS2:1.

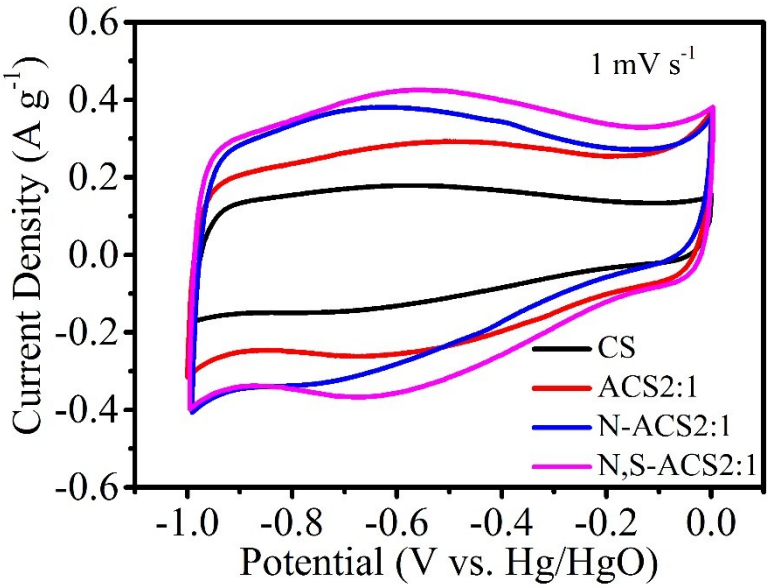

Fig. S3 CV curves of the CS, ACS2:1, N-ACS2:1 and N,S-ACS2:1 electrodes at a scan rate of 1 mV s^{-1}.

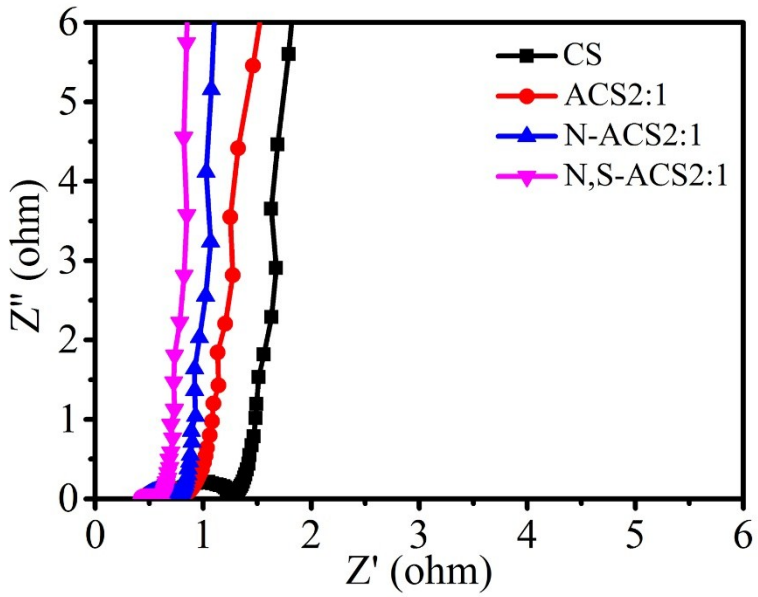

Fig. S4 Nyquist plots for the samples of CS, ACS2:1, N-ACS2:1, and N,S-ACS2:1.

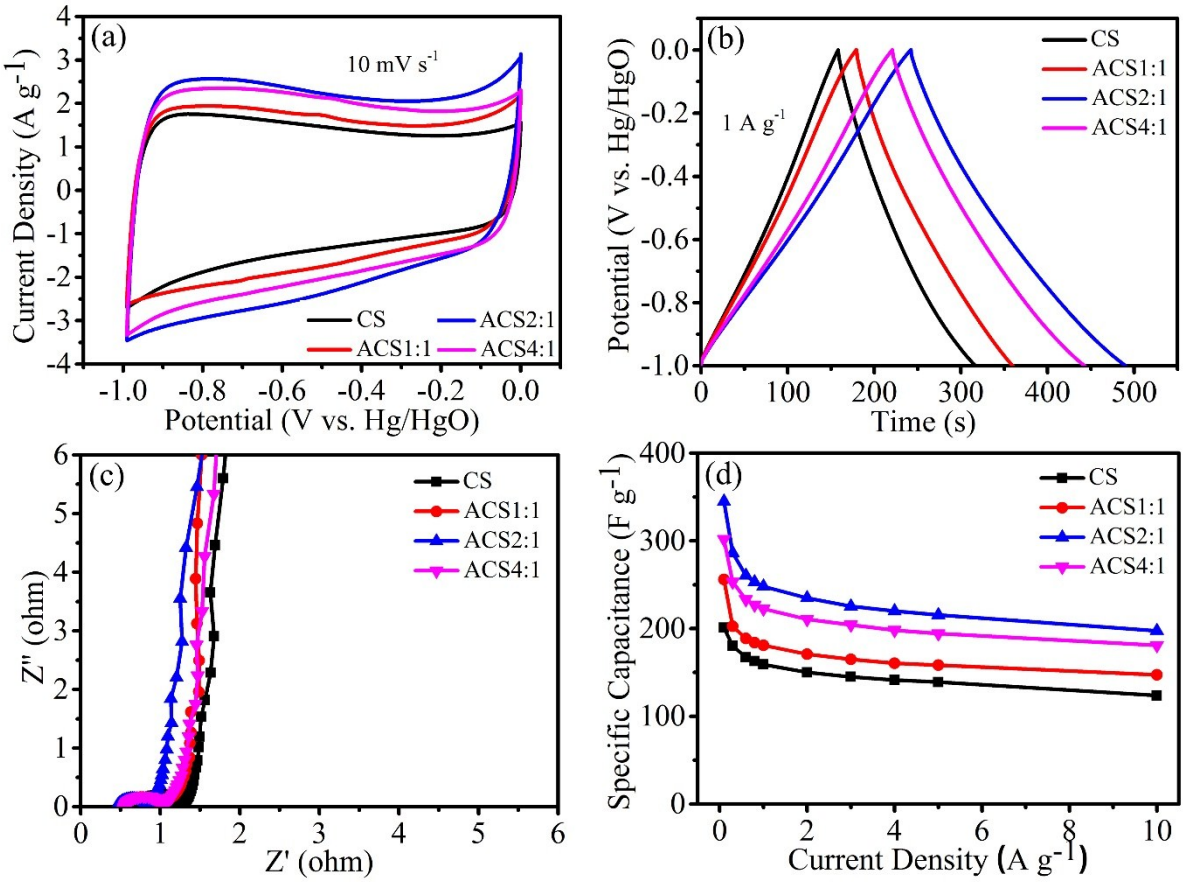

Fig. S5 Electrochemical performance of the CS, ACS1:1, ACS2:1 and ACS4:1 electrodes measured in 6 mol L^{-1} KOH using three-electrode systems: a) CV curves at a scan rate of 10 mV s^{-1}. b) Typical galavanostatic charge-discharge profiles of the samples at a current density of 1 A g^{-1}. c) Nyquist plots. d) Specific capacitance of the samples at different current densities.

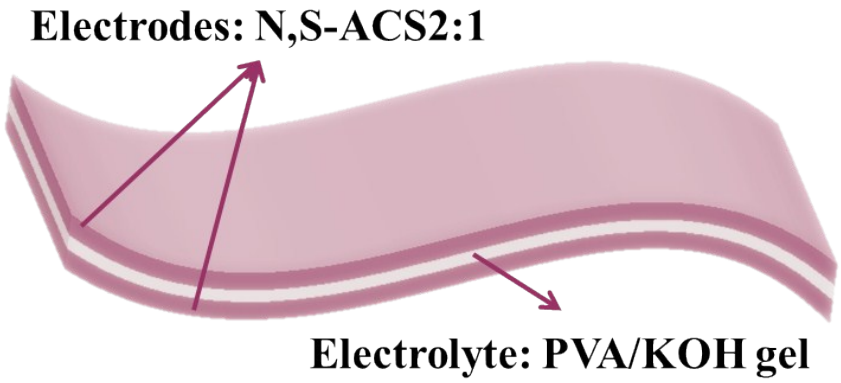

Fig. S6 Schematic illustration of the solid-state supercapacitor using N,S-ACS2:1 as the electrodes with a polymer electrolyte gel as the electrolyte and separator.

Table S1 Summary of electrochemical parameters of biomass/biowaste derived carbon as supercapacitor electrodes.

Materials	Specific surface area (m^2 g^{-1})	Electrolyte	Current density	Specific capacitance (F g^{-1})	Ref.
N-C-RGO-Networks	332.6	6M KOH	1 A g^{-1}	250	[S1]
Eggshell membrane	221.2	1M KOH	0.2 A g^{-1}	297	[S2]
Carbonized eggshell membrane	221.2	1M KOH	4 A g^{-1}	228	[S3]
lotus stems	1610	6M KOH	5 mV s^{-1}	174	[S4]
N,S-doped Willow catkin derived porous carbon sheets	1533	6M KOH	0.5 A g^{-1}	298	[S5]
Lignin	907	1M H_2SO_4	0.05 A g^{-1}	165	[S6]
Pomelo peel derived carbon	272	6M KOH	0.2 A g^{-1}	342	[S7]
Yogurt	1300	6M KOH	2 A g^{-1}	225	[S8]
Cotton	1563	6M KOH	0.1 A g^{-1}	314	[S9]
Bamboo byproduct	1472	6M KOH	0.1 A g^{-1}	301	[S10]
ACS2:1	**1909.4**	**6M KOH**	**0.1 A g^{-1}** **1 A g^{-1}**	**345** **248.1**	**This work**
N,S-ACS2:1	**1873.6**	**6M KOH**	**0.1 A g^{-1}** **1 A g^{-1}**	**404.2** **303.6**	**This work**

Supplementary References

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