Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

3D Porous Binary-Heteroatom Doped Carbon Nanosheet/Electrochemically Exfoliated Graphene Hybrids for High Performance Flexible Solid-State Supercapacitors

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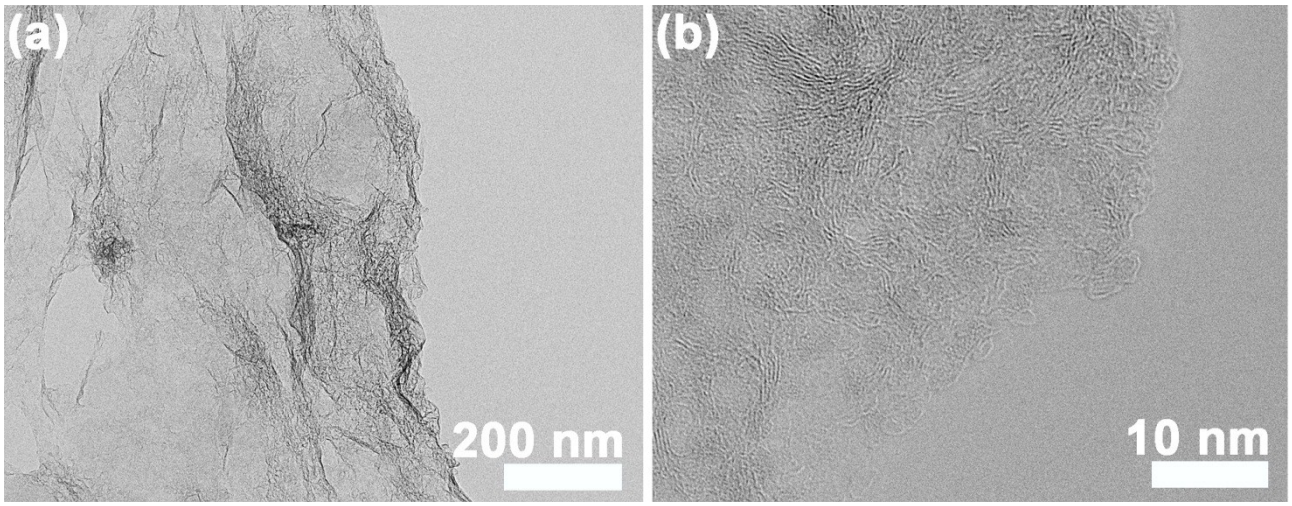

Fig. S1 TEM and HRTEM images of EG.

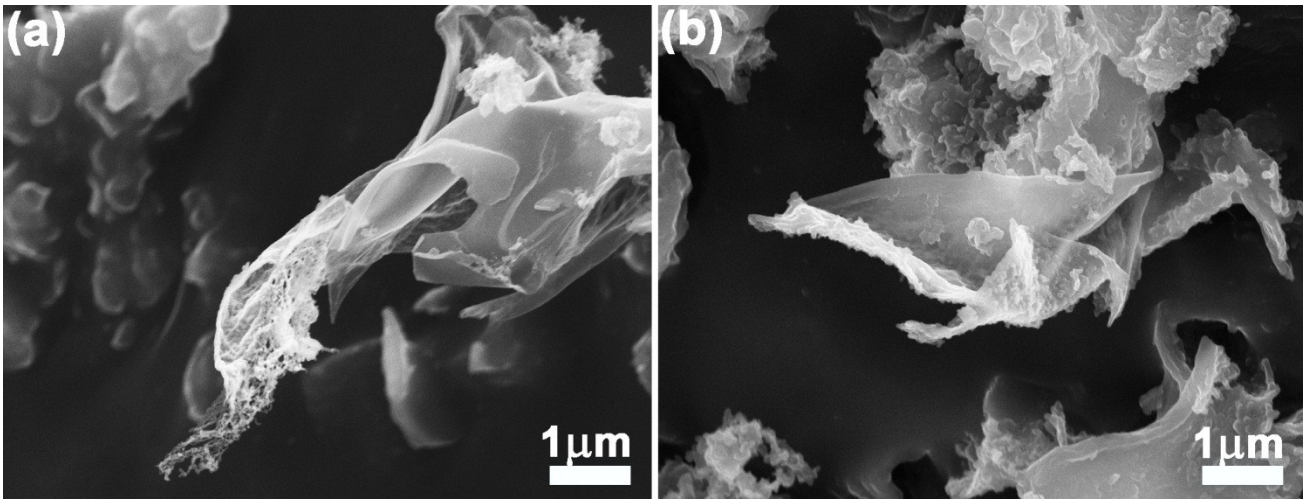

Fig. S2 SEM images of the (a) CNS/EG-5 and (b) CNS/EG-20 hybrids.

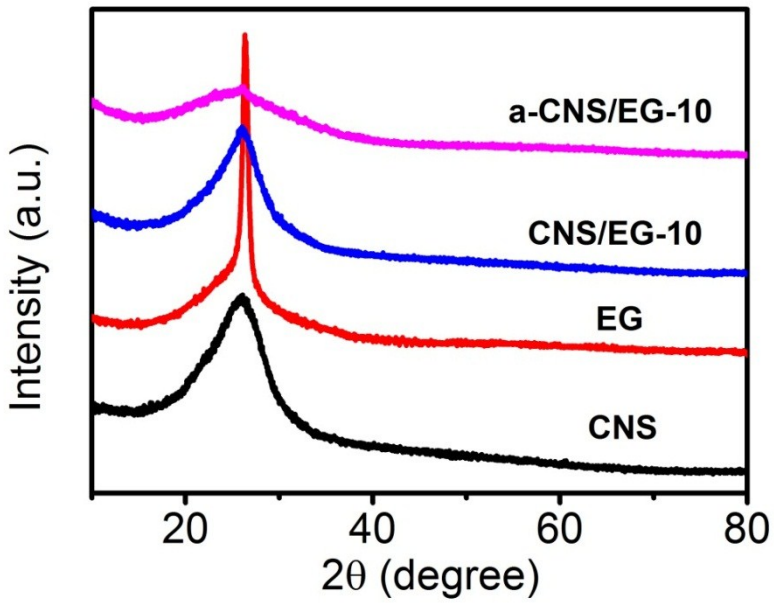

Fig. S3 XRD patterns of CNS, EG, CNS/EG-10, and a-CNS/EG-10.

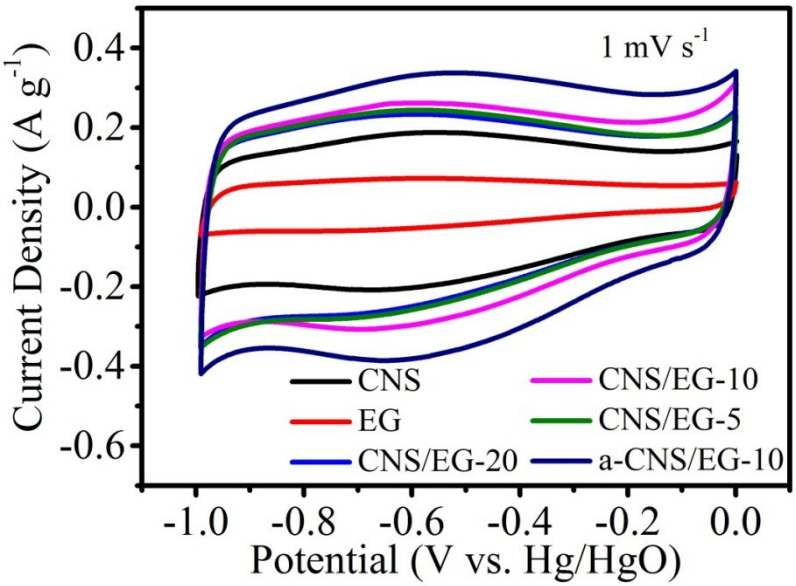

Fig. S4 CV curves of the CNS, EG, CNS/EG, and a-CNS/EG-10 electrodes at a scan rate of 1 mV s^{-1}.

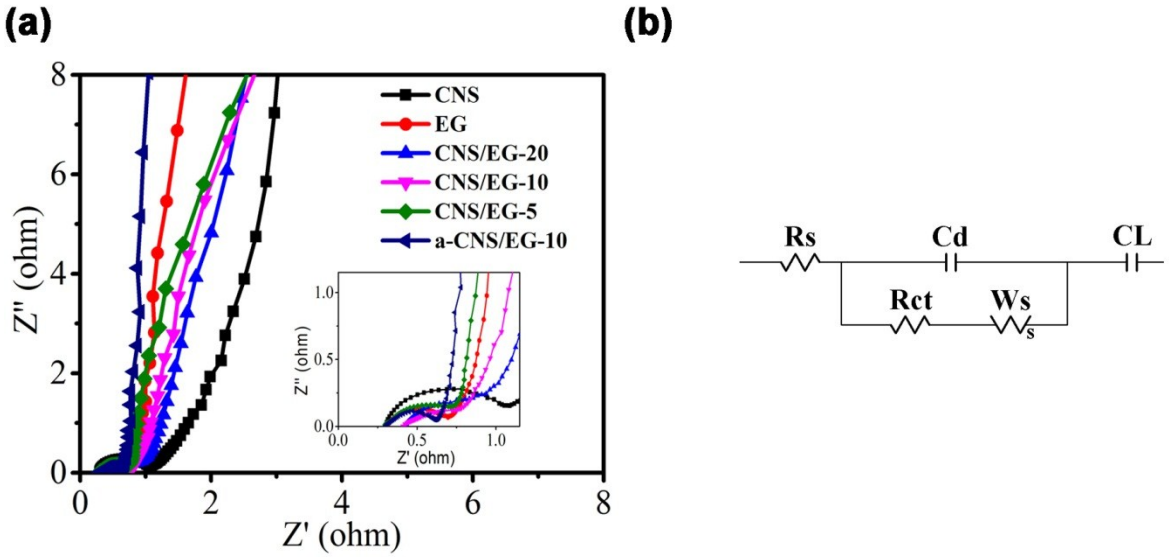

Fig. S5 (a) Nyquist plots of the CNS, EG, CNS/EG, and a-CNS/EG-10 samples measured in 6 mol L^{-1} KOH electrolyte using three-electrode systems (the inset shows the magnified high frequency range). (b) The equivalent circuit of EIS.

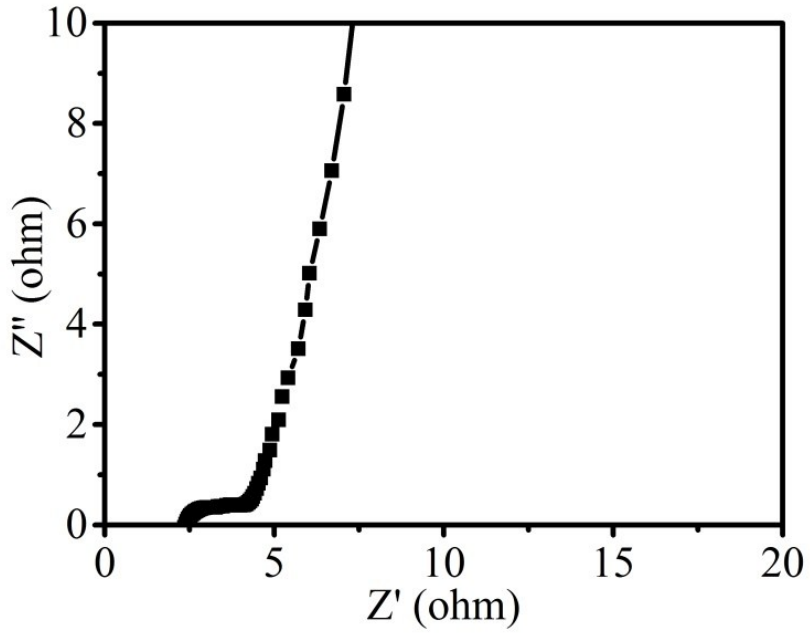

Fig. S6 Nyquist plot of the solid-state supercapacitor with a-CNS/EG-10 electrode measured in PVA/KOH gel electrolyte.

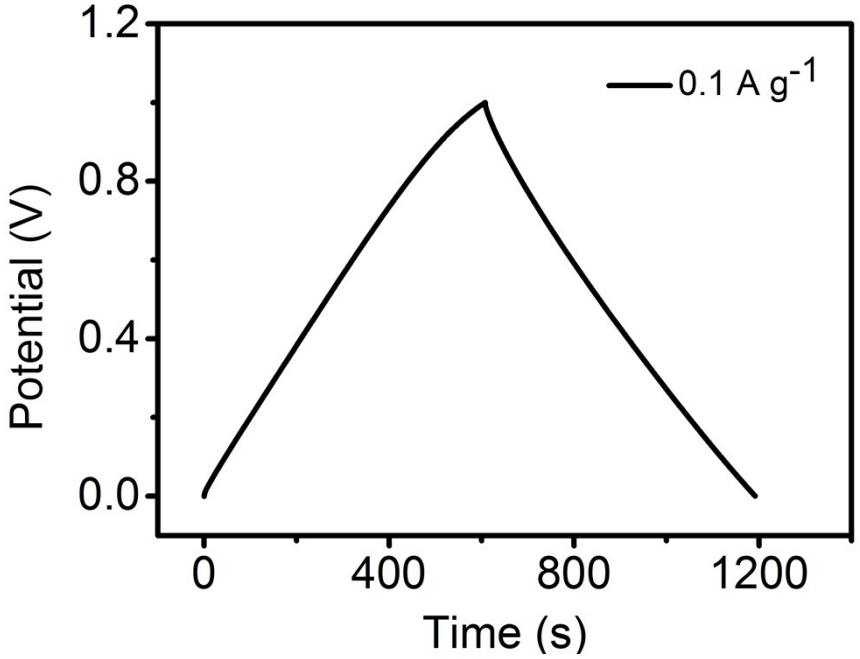

Fig. S7 Galvanostatic charge-discharge curves of the solid-state supercapacitor at a current density of 0.1 A g^{-1}

Table S1 Comparison of specific capacitance of carbon composites in flexible solid-state supercapacitors

Materials	Current density ($A\ g^{-1}$)	Capacitance ($F\ g^{-1}$)	Electrolyte	Reference
Active carbon	1	70.84	Ionic liquid + poly (ethylene oxide)+ benzophenone	1
Functionalized carbon nanotube-coated cellulose paper	2	47	PVA hydrogel	2
Pind/CNT nanofibers	0.5	109	PVA/H_2SO_4	3
Hierarchical porous carbon network	0.25	52.5	PVA/H3PO4	4
Hierarchical porous carbon	0.5	81.3	PVA/KOH	5
Active porous carbon nanofibers	0.5	142	Silica-based ionic liquid gel	6
CNT fibers-MnO_2	0.5	68	PYR14TFSI-PVDF-co-HFP polymer	7
3D graphene	1	24	PVA–H_2SO_4	8
CNFs/PANI	0.25	201	PVA/H_2SO_4	9
CNS/EG	0.1	234	PAN/KOH	This work

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