

Supporting Information

MOFs-derived Co_9S_8 embedded graphene/hollow carbon spheres film with macroporous frameworks for hybrid supercapacitor with superior volumetric energy density

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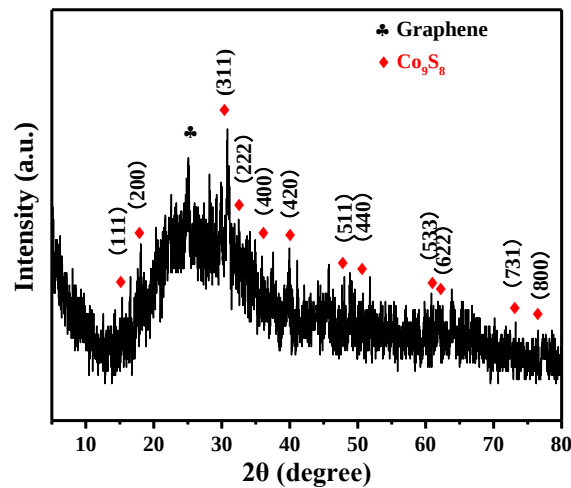


Fig. S1 XRD pattern of the macroporous thin film of GH@NC@ Co_9S_8 .

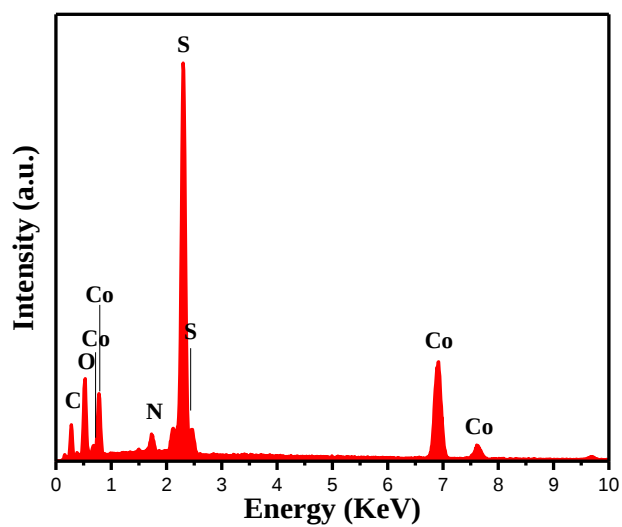


Fig. S2 EDS image of the hybrid macroporous thin film of GH@NC@Co₉S₈.

Table S1. The bonding energy of each element of GH@NC@Co₉S₈

Element		Bonding energy (eV)		
Co	2p _{1/2} (797.6)	2p _{3/2} (781.3)		
S	2p _{1/2} (162.9)	2p _{3/2} (161.8)	C-S (163.7)	SO ₄ ²⁻ (168.6)
N	N-C (398.7)	N-O (400.0)		
C	C=C/C-C (284.5)	C-N (285.5)	O-C=O (288.7)	
O	1s (531.7)			

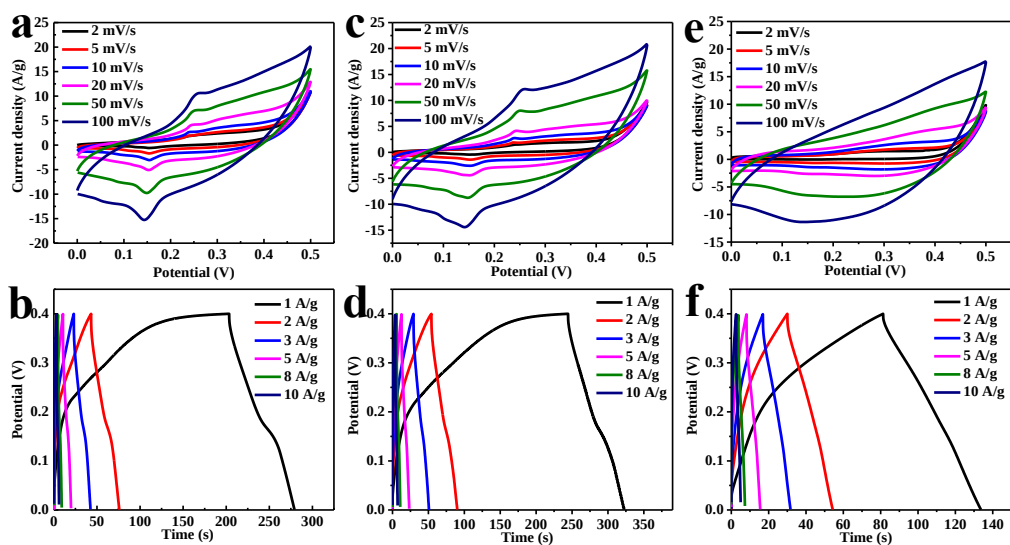


Fig. S3 (a, c, e) CV curves of various volume ratio GH@NC@Co₉S₈ products (150/50 , 300/50, 600/50) at various scan rate, respectively; (b, d, f) GCD curves of various volume ratio GH@NC@Co₉S₈ (450/50) products (150/50, 300/50, 600/50) at various current density, respectively.

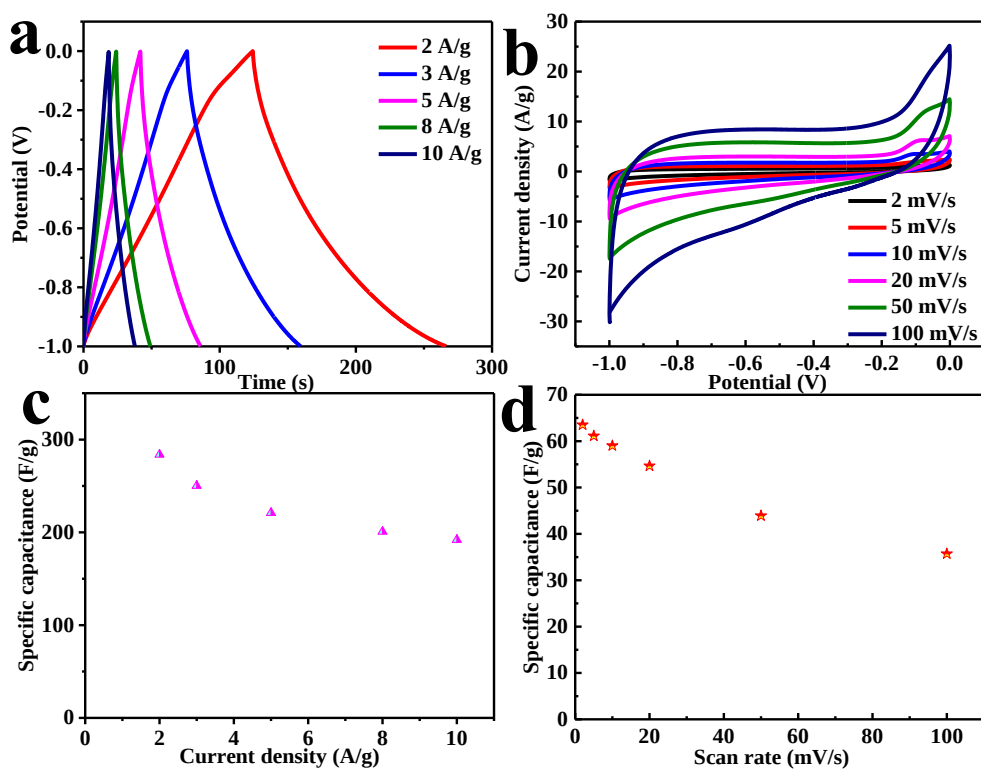


Fig. S4 (a, b) CV and GCD curves of GH@NC thin film; (c, d) the corresponding specific capacitance of CV and GCD curves of GH@NC.

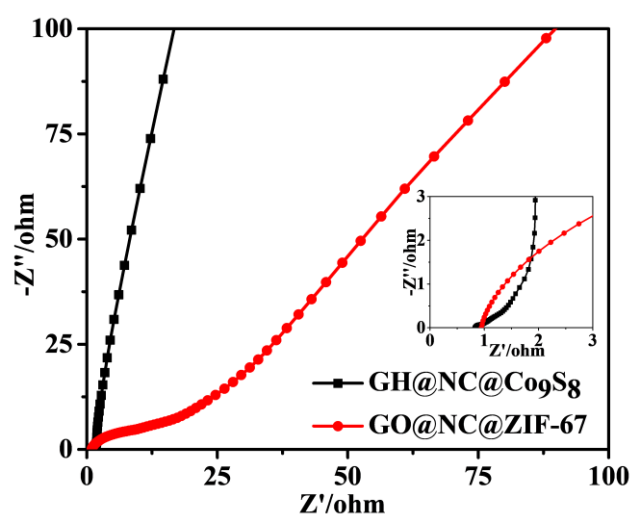


Fig. S5 Nyquist plots of $\text{GH@NC@Co}_9\text{S}_8$ electrode and GO@NC@ZIF-67 electrodes.