

Supporting information

**Design of porous cobalt sulfide nanosheets array on Ni foam from zeolitic
imidazolate frameworks as an advanced electrode for supercapacitors**

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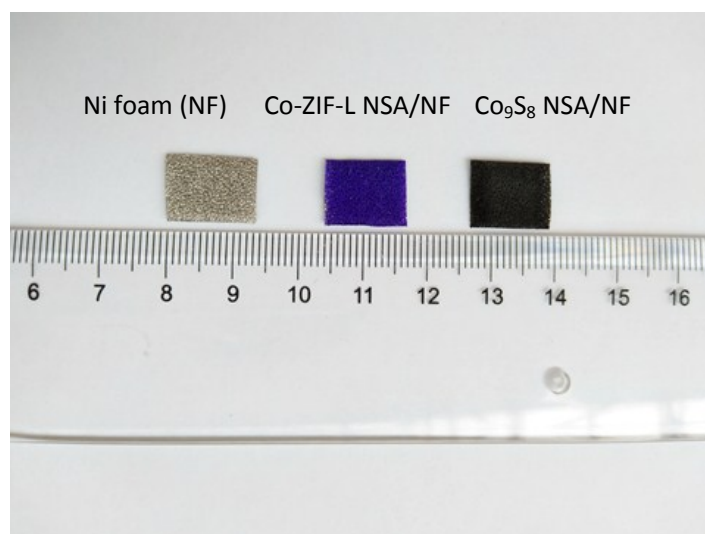


Figure S1 Optical image of NF, Co-ZIF-L-NSA/NF and Co₉S₈-NSA/NF.

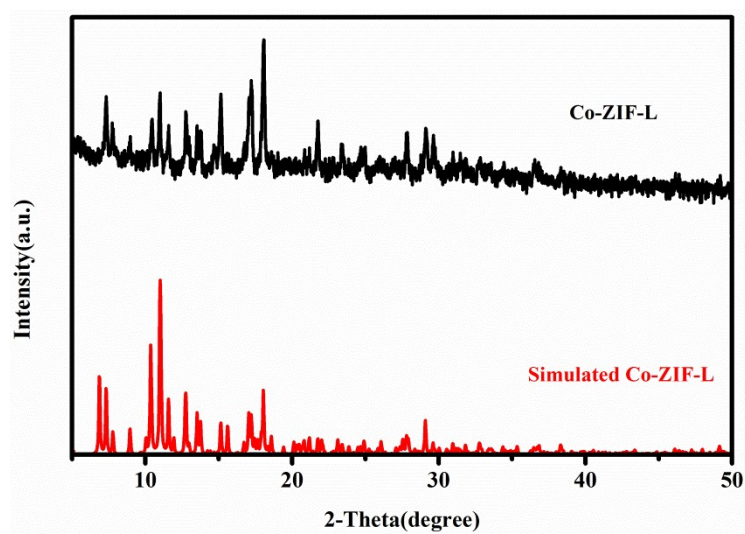


Figure S2 XRD pattern of Co-ZIF-L precipitate collected from the bottom of the synthesis solution.

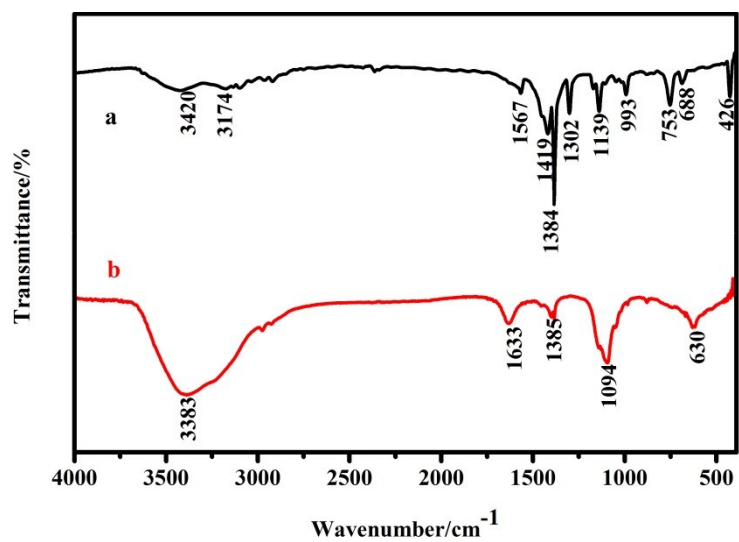


Figure S3 FTIR spectrum of (a) Co-ZIF-L-NSA/NF and (b) Co₉S₈-NSA/NF.

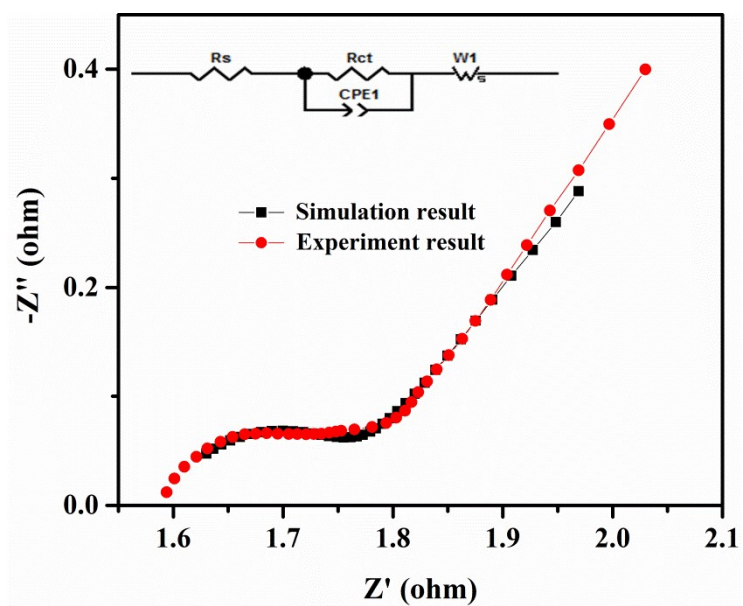


Figure S4 EIS Nyquist plots of the $\text{Co}_9\text{S}_8\text{-NSA/NF}$ electrode.

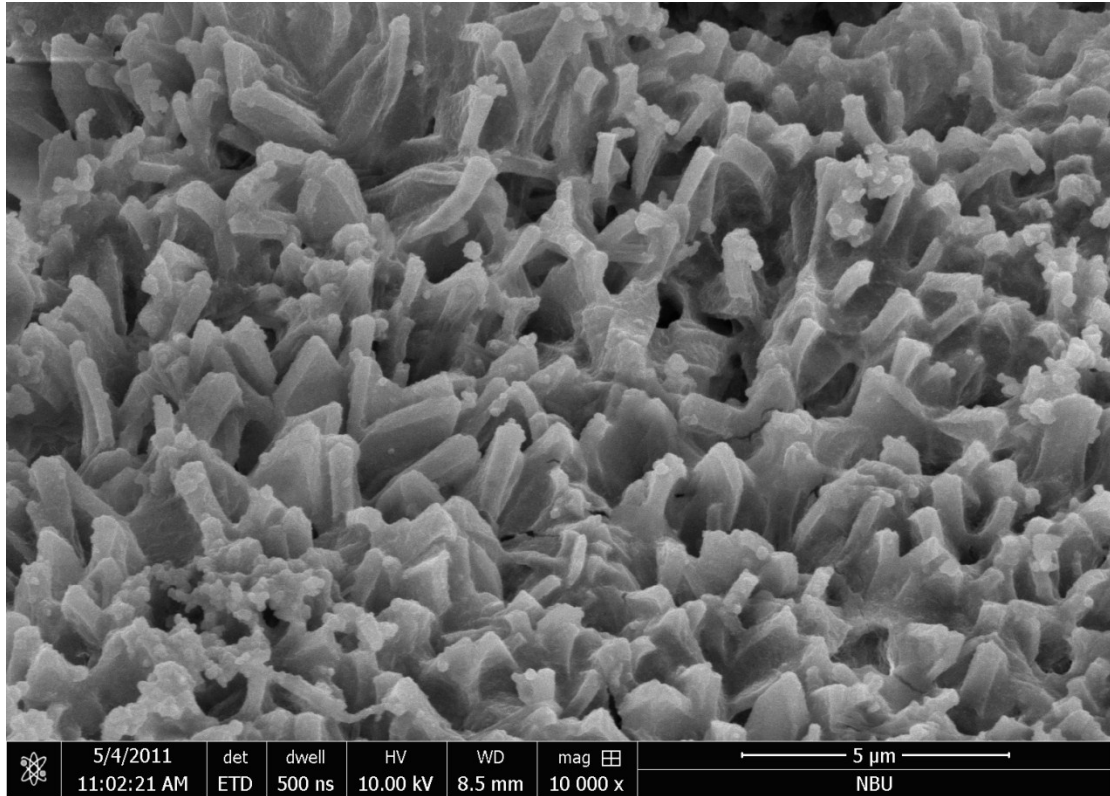


Figure S5 SEM image of Co_9S_8 -NSA/NF after 1000 cycles of GCD test.

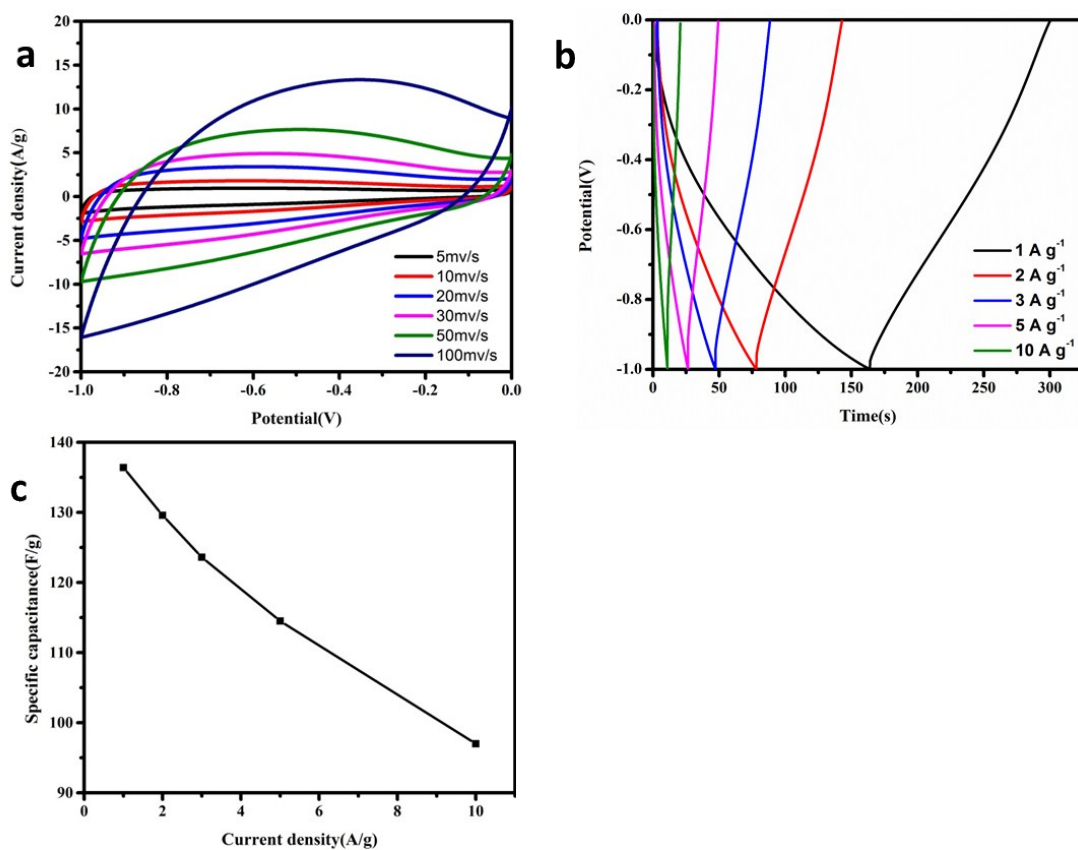


Figure S6 (a) CV curves of AC electrode at different scan rates, (b) GCD curves of AC electrode at different current densities and (c) The corresponding specific capacitance of AC electrode calculated by the GCD curves.

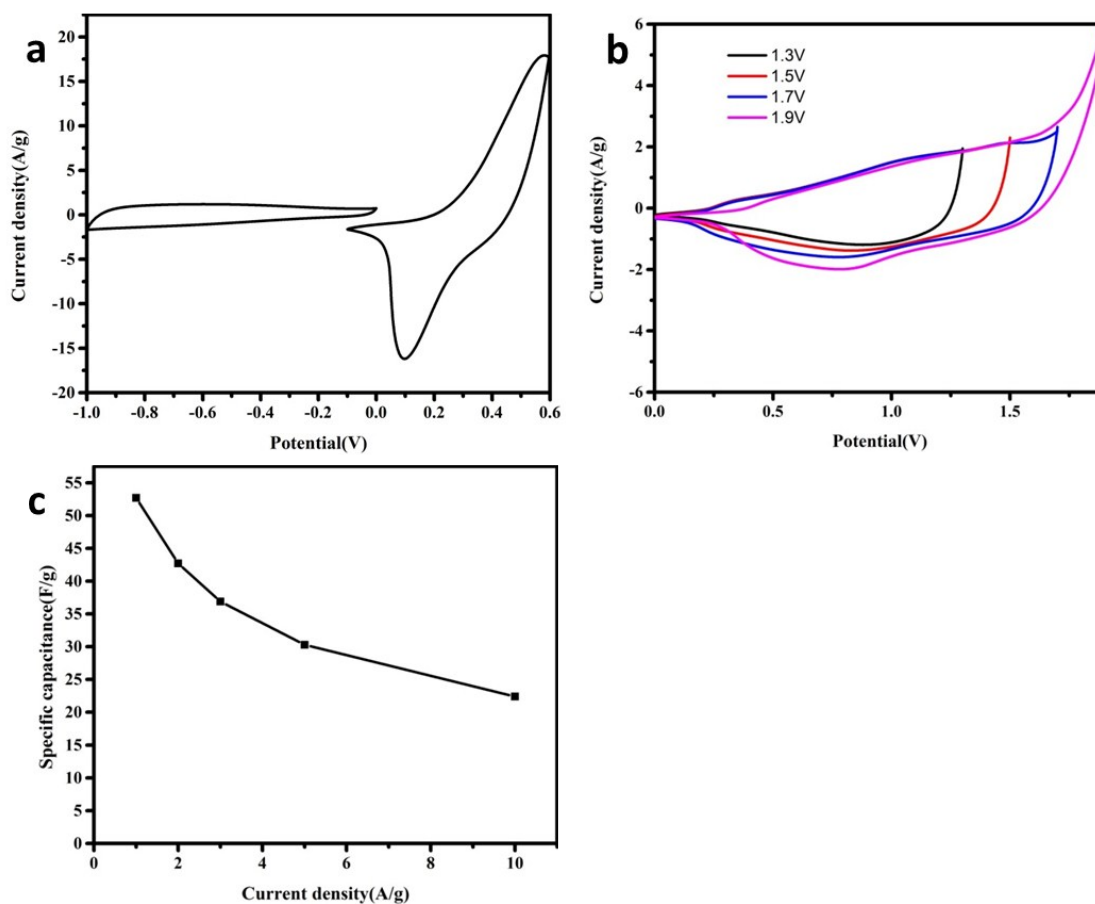


Figure S7 (a) CV curves of the Co₉S₈-NSA and AC electrodes tested at a scan rate of 20 mV/s in a three-electrode mod, (b) CV curves of ASC device at different voltage windows with scan rate of 20 mV s⁻¹ and (c) specific capacitance of ASC device versus different current densities.

Table S1. Electrochemical performance of representative cobalt based sulfide electrodes

Electrode materials	Specific capacitance	Current density	Refs
Co ₉ S ₈ NSA	1098.8 F g ⁻¹	0.5 A g ⁻¹	This work
Co ₉ S ₈ NSA	954.5 F g ⁻¹	1 A g ⁻¹	This work
CoS _{1.097} microspheres	186 F g ⁻¹	0.5 A g ⁻¹	1
Ni _x Co _{1-x} S _{1.097} microspheres	867 F g ⁻¹	0.5 A g ⁻¹	1
Ni ₃ S ₂ @Co ₉ S ₈	600 F g ⁻¹	0.5 A g ⁻¹	2
Flower-like Co ₉ S ₈	522 F g ⁻¹	0.5 A g ⁻¹	3
CoS _{1.097} nanotube networks	764 F g ⁻¹	0.5 A g ⁻¹	4
Double-shelled CoS nanoboxes	980 F g ⁻¹	1 A g ⁻¹	5
Ni _x Co _{3-x} S ₄ hollow nanoprisms	895 F g ⁻¹	1 A g ⁻¹	6
Co ₉ S ₈ / S,N-dped carbon	734.1 F g ⁻¹	1 A g ⁻¹	7
Hollow Co _{1-x} S	420 F g ⁻¹	1 A g ⁻¹	8
CoS _x /C	496.8 F g ⁻¹	0.5 A g ⁻¹	9
Co ₉ S ₈ @S,N-dped Carbon	429 F g ⁻¹	1 A g ⁻¹	10

References

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