

Supporting Information

Integrated design and construction of NiMoS₄@Co₉S₈/Ni₃S₂ hollow core-shell heterostructure for high-performance asymmetric supercapacitor

Gaigai Yu,^{a,#} Lei Wu,^{a,#} Shijie Huang,^c Wenna Zhao,^{b,*} and Lei Han^{a,*}

^a State Key Laboratory Base of Novel Functional Materials and Preparation Science, School of Materials Science and Chemical Engineering, Ningbo University, Ningbo, Zhejiang 315211, China. E-mail: hanlei@nbu.edu.cn.

^b School of Biological and Chemical Engineering, Ningbotech University, Ningbo, Zhejiang 315100, China. E-mail: wenzhao@nit.zju.edu.cn.

^c Ningbo Customs District Technology Center, Ningbo, Zhejiang 315048, China.

[#] These authors contributed equally to this work.

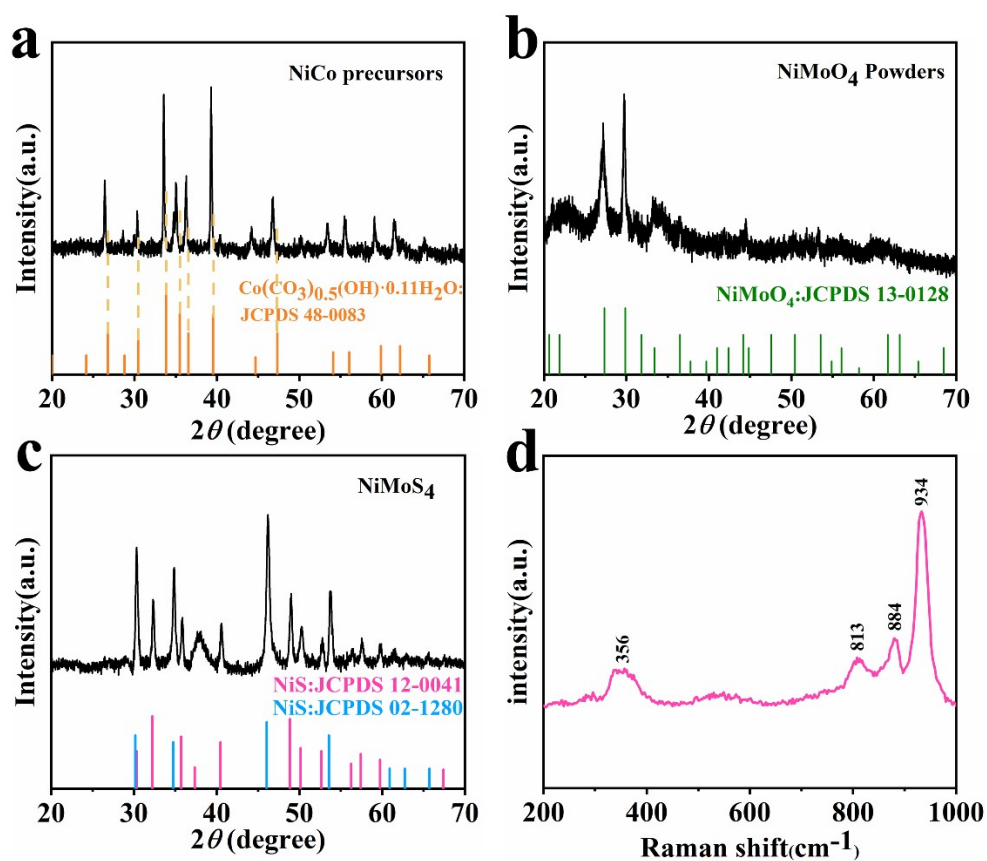


Fig. S1. XRD patterns of (a) NiCoCH precursors, (b) NiMoO₄ powders (c) NiMoS₄; Raman spectra of (d) NiMoS₄.

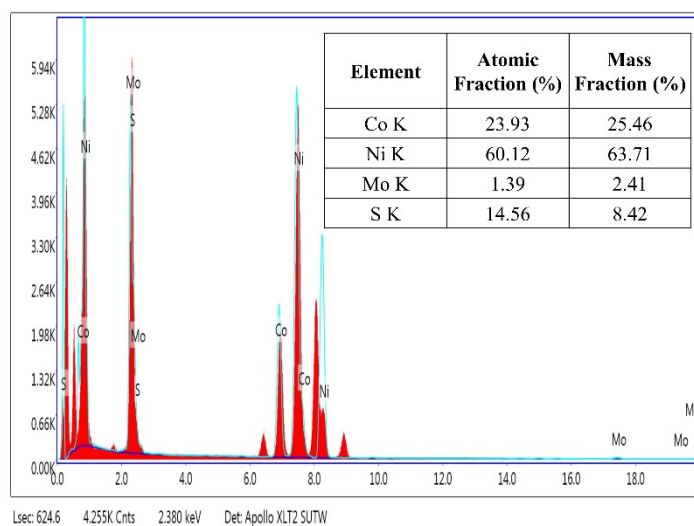


Fig. S2. EDAX spectrum of NiMoS₄@Co₉S₈/Ni₃S₂.

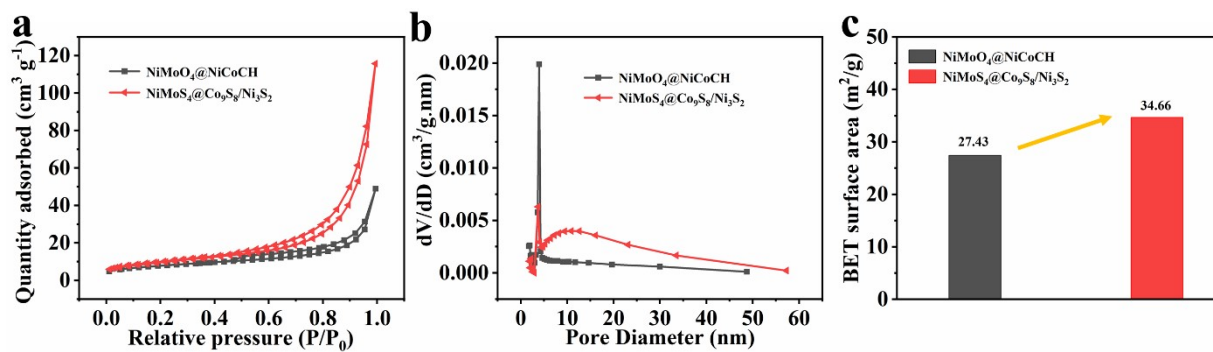


Fig. S3. (a) Nitrogen adsorption-desorption isotherms of NiMoO₄@NiCoCH and NiMoS₄@Co₉S₈/Ni₃S₂; (b) The pore size distribution of NiMoO₄@NiCoCH and NiMoS₄@Co₉S₈/Ni₃S₂; (c) BET specific surface area.

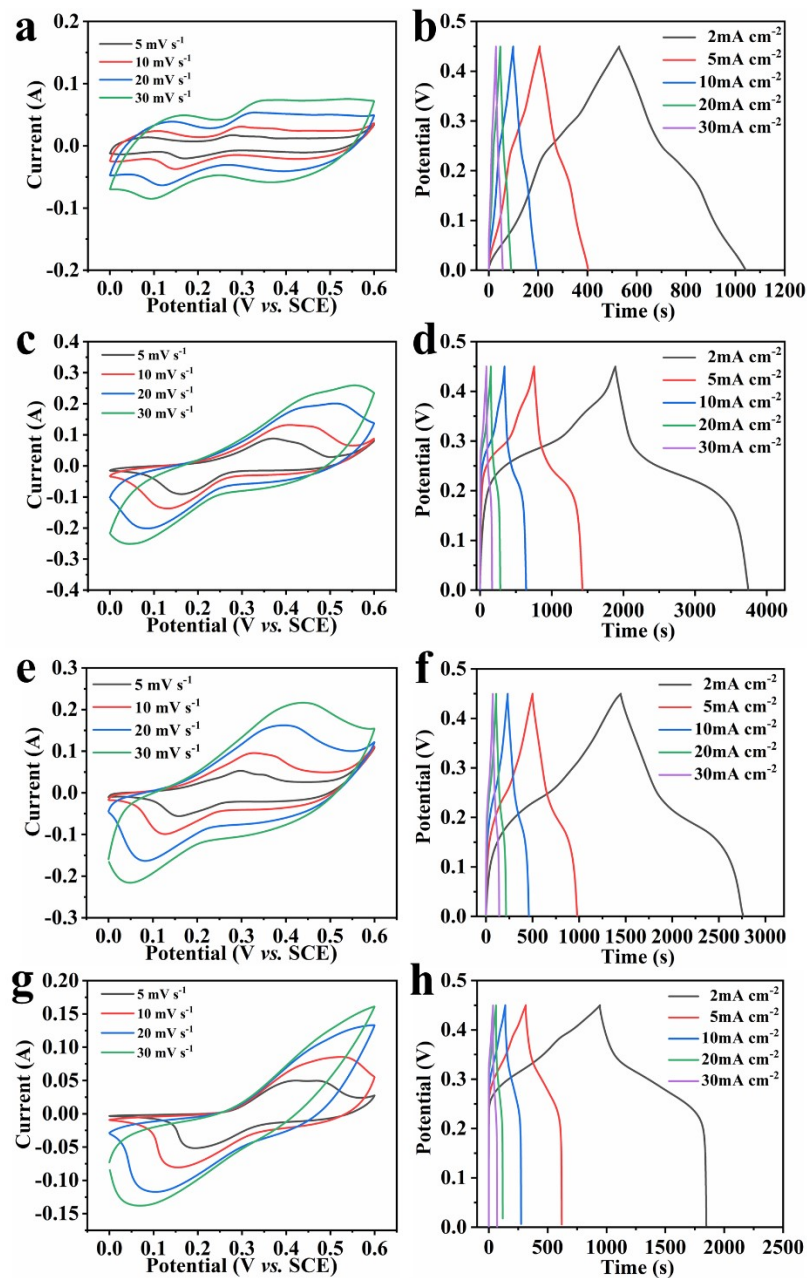


Fig. S4. (a, c, e and g) CV curves of NiCoCH/NF, NiMoS₄@Co₉S₈/Ni₃S₂/NF, Co₉S₈/Ni₃S₂/NF and NiMoS₄/NF; (b, d, f and h) GCD curves of NiCoCH/NF, NiMoS₄@Co₉S₈/Ni₃S₂/NF, Co₉S₈/Ni₃S₂/NF and NiMoS₄/NF.

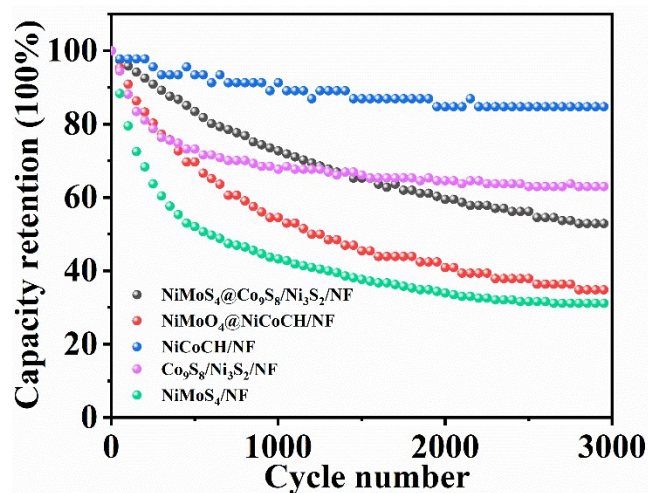


Fig. S5. The cycle stability of NiCoCH/NF, NiMoO₄@NiCoCH/NF, NiMoS₄/NF, Co₉S₈/Ni₃S₂/NF and NiMoS₄@Co₉S₈/Ni₃S₂/NF.

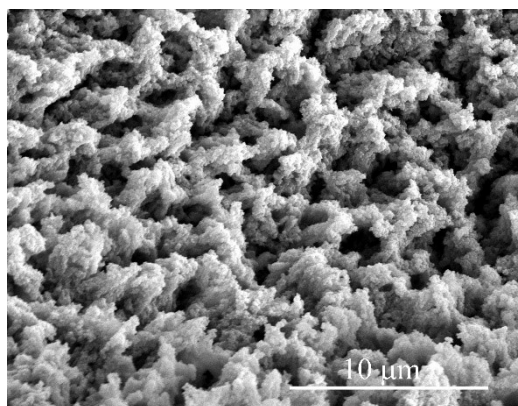


Fig. S6. SEM images of NiMoS₄@Co₉S₈/Ni₃S₂/NF after 3000 cycles.

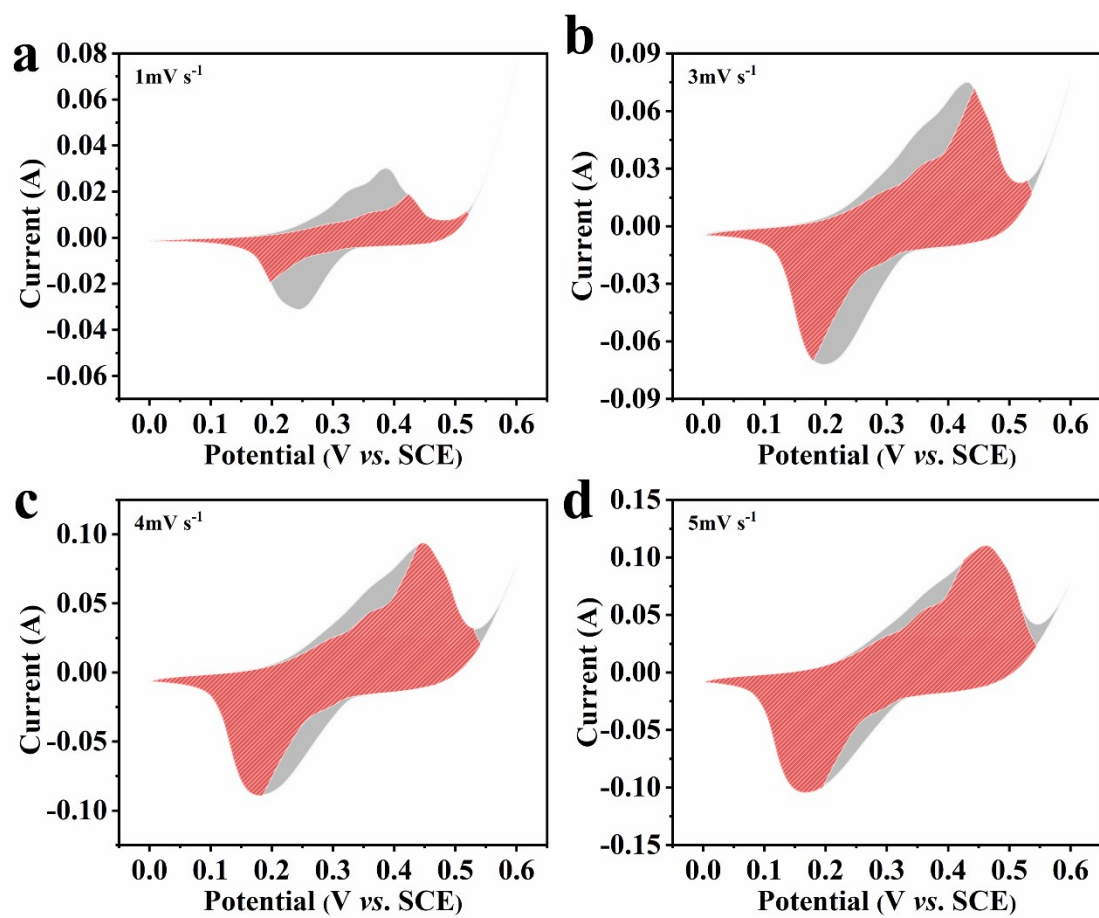


Fig. S7. Capacitive contribution (red) during charge storage at (a) 1 mV s^{-1} , (b) 3 mV s^{-1} , (c) 4 mV s^{-1} , (d) 5 mV s^{-1} .

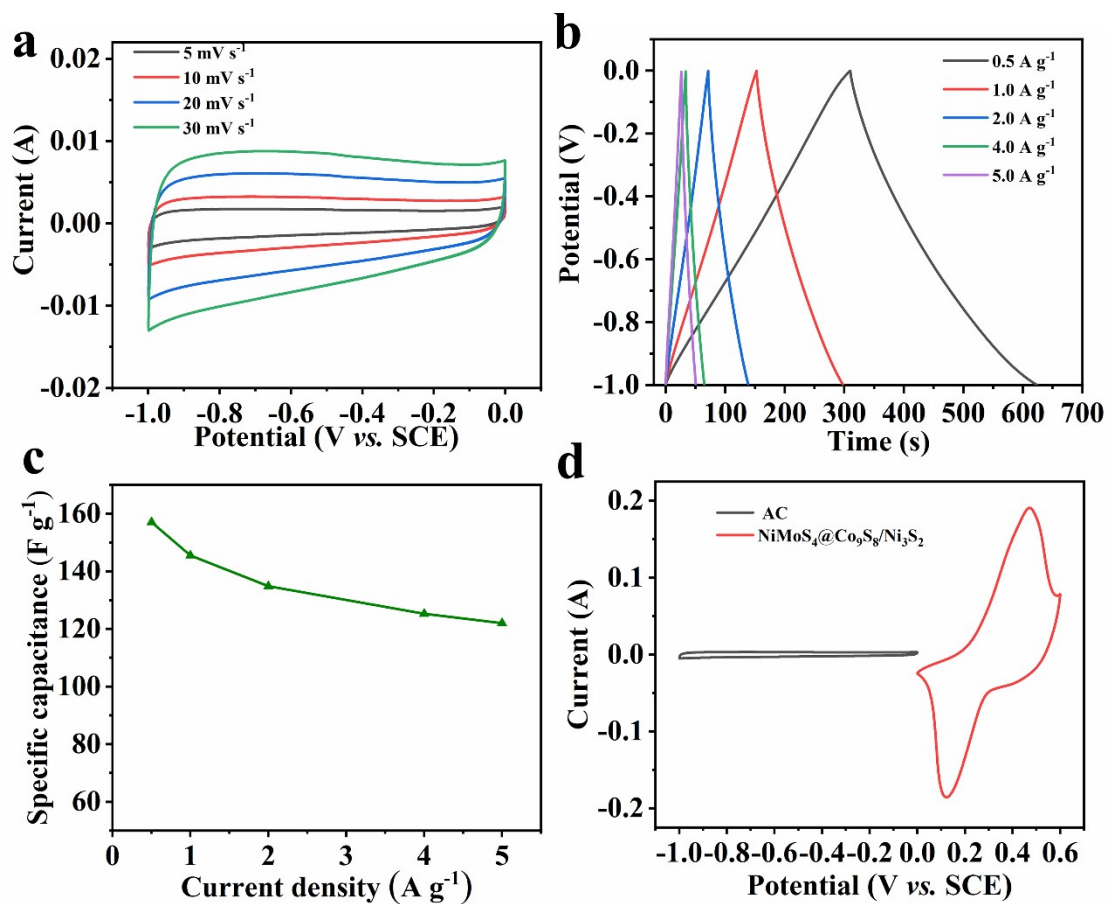


Fig. S8. Electrochemical performances of AC: (a) CV curves; (b) GCD curves; (c) Specific capacitance; (d) CV curves for the AC and NiMoS₄@Co₉S₈/Ni₃S₂ electrodes at 10 mV s⁻¹.