

Supporting Information

Facile Synthesis of Porous Bimetallic Co-Ni Fluorides for High-Performance Asymmetric Supercapacitors

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Table S1. Amount of metal acetate tetrahydrate added in synthesis of $\text{Ni}_x\text{Co}_{(1-x)}\text{F}_2$

Target composites of $\text{Ni}_x\text{Co}_{(1-x)}\text{F}_2$	Abbreviation	$\text{Co}(\text{CH}_3\text{COO})_2 \cdot 4\text{H}_2\text{O}$ (mmol)	$\text{Ni}(\text{CH}_3\text{COO})_2 \cdot 4\text{H}_2\text{O}$ (mmol)
CoF_2	NC-0-2	3	0
$\text{Ni}_{1/3}\text{Co}_{2/3}\text{F}_2$	NC-1-2	2	1
$\text{Ni}_{0.5}\text{Co}_{0.5}\text{F}_2$	NC-1-1	1.5	1.5
$\text{Ni}_{2/3}\text{Co}_{1/3}\text{F}_2$	NC-2-1	2	2
NiF_2	NC-2-0	0	3

Table S2. The length, width and aspect ratio of Ni-Co precursor

Target composites	Length (nm)	Width (nm)	Aspect ratio
NC-0-2	1200	450	2.66
NC-1-2	400	170	2.35
NC-1-1	375	200	1.87
NC-2-1	950	550	1.72
NC-2-0	458	430	1.06

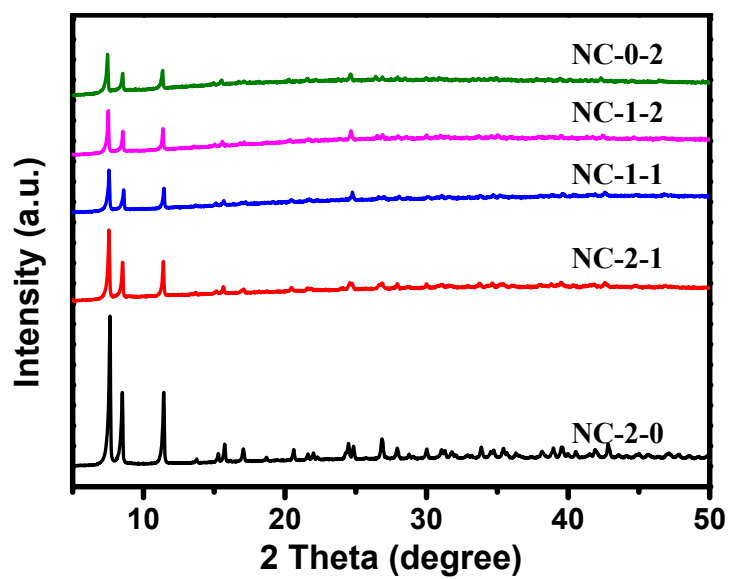


Fig. S1 Ni-Co precursor XRD patterns with different ratios of Ni/Co.

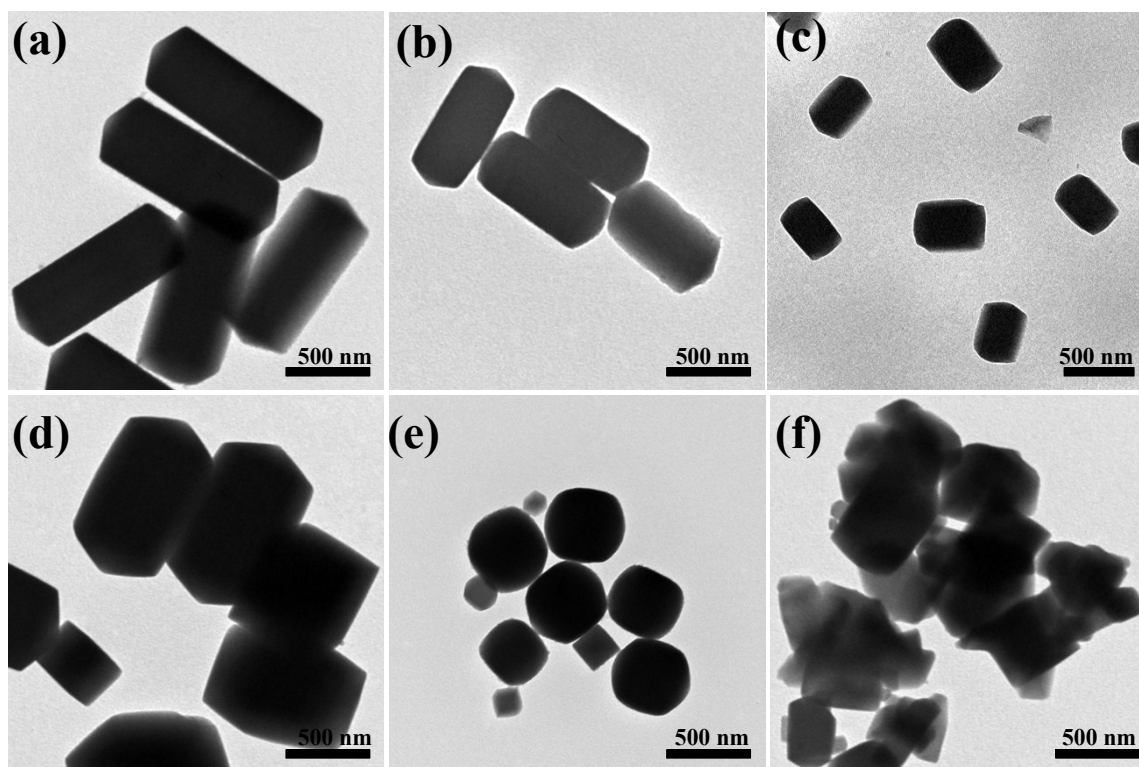


Fig. S2 TEM images of Ni-Co precursor with different ratios. (a) NC-0-2, (b) NC-1-2, (c) NC-1-1, (d) NC-2-1, (e) NC-2-0, and (f) NC-1-1 without PVP.

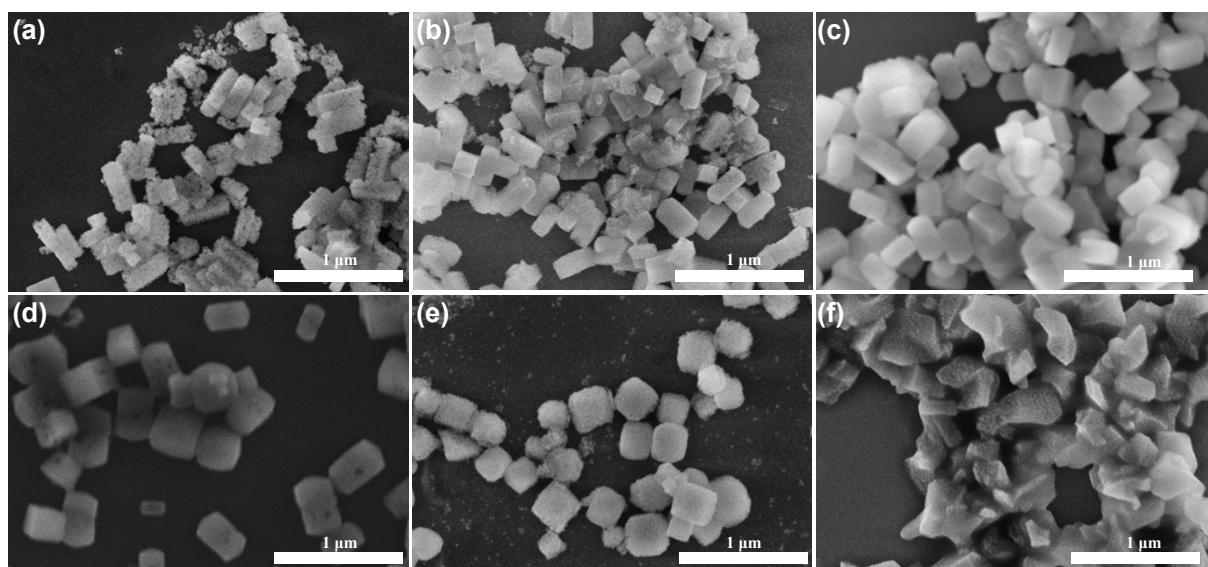


Fig. S3 SEM images of Ni-Co-F with different ratio. (a) NCF-0-2, (b) NCF-1-2, (c) NCF-1-1, (d) NCF-2-1, (e) NCF-2-0, and (f) NCF-1-1 without PVP

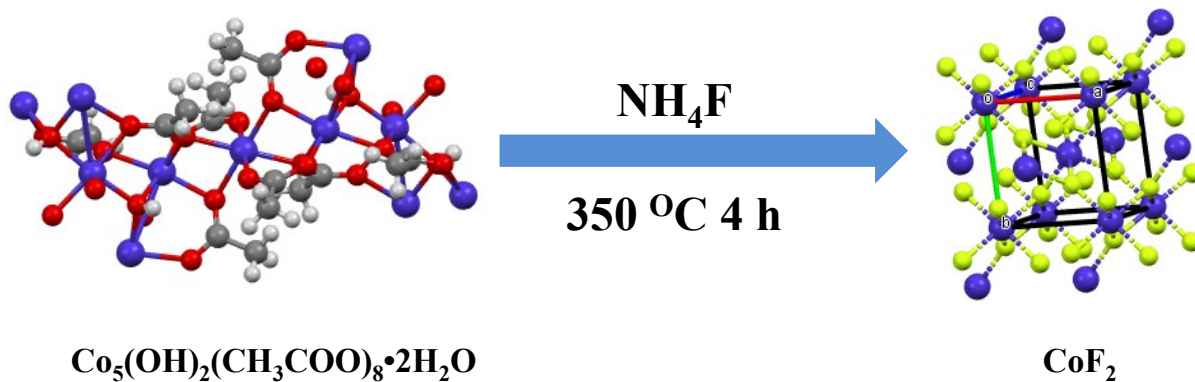


Fig. S4. Schematic illustration of the coordination structure transformation for Co precursors during the fluorination process.

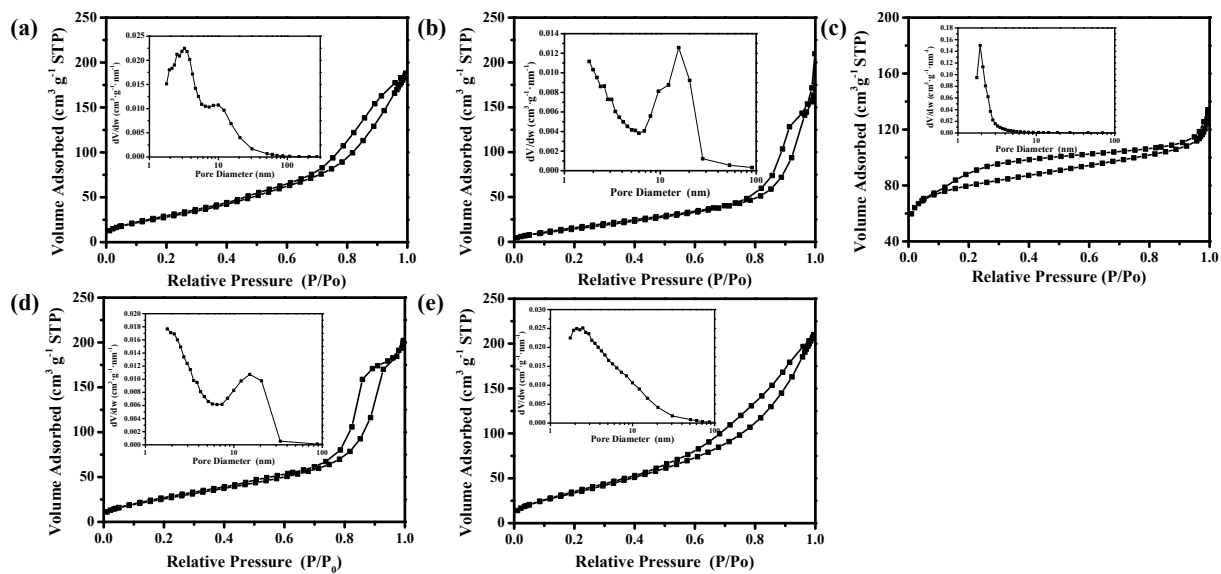


Fig. S5. N_2 adsorption-desorption isotherms and pore size distributions of $Ni_{1-x}Co_xF_2$. (a) NCF-0-2, (b) NCF-1-2, (c) NCF-1-1, (d) NCF-2-1, and (e) NCF-2-0.

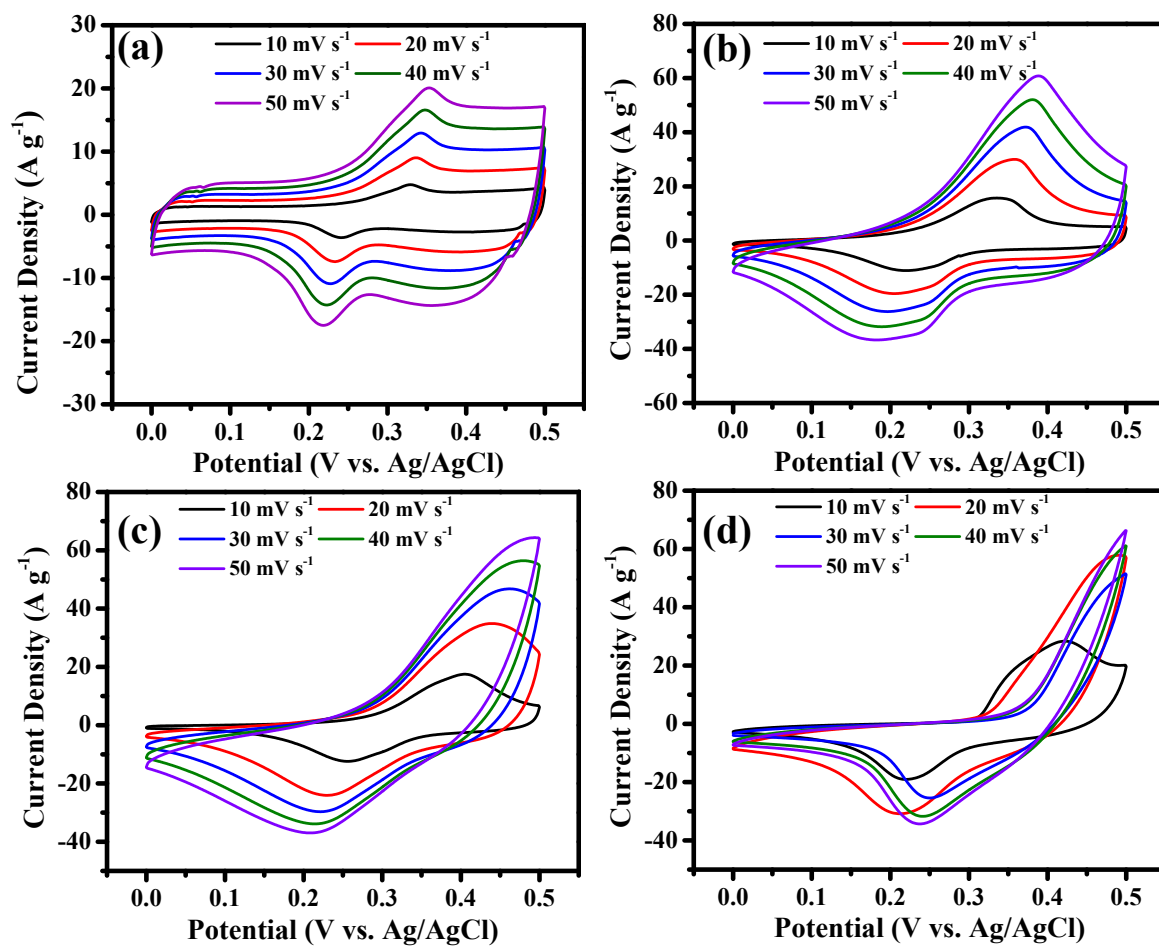


Fig. S6 CV curves at different scan rates of (a) NCF-0-2, (b) NCF-1-2, (c) NCF-2-1 and (d) NCF-2-0.

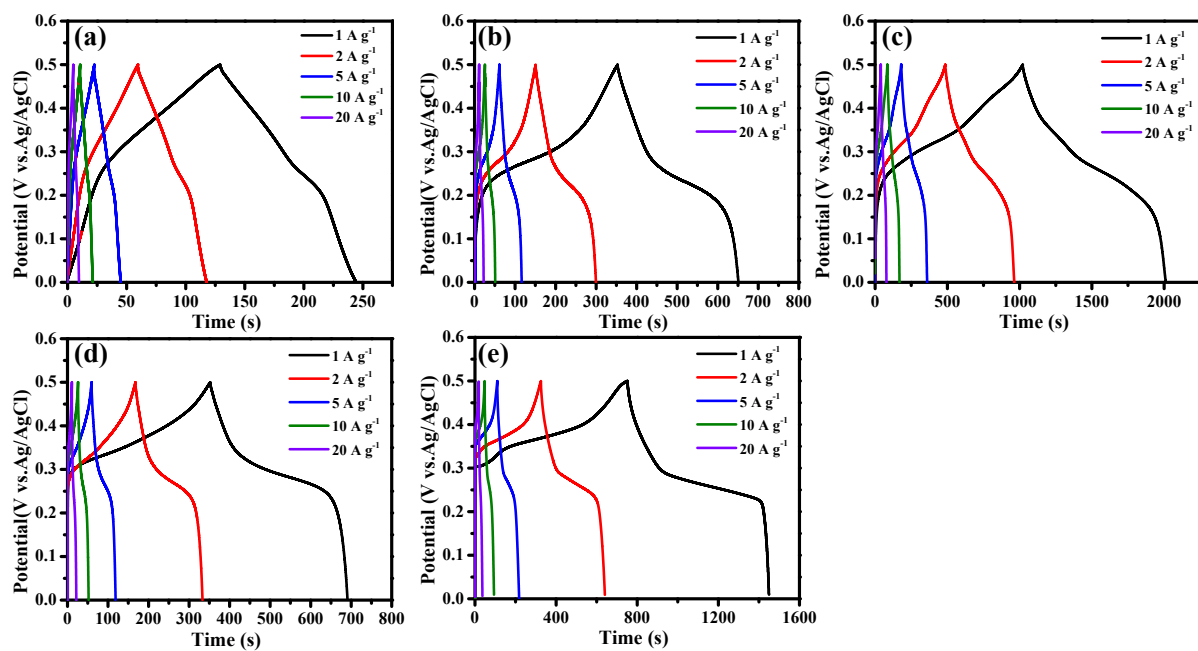


Fig. S7 GCD curves at different current density of (a) NCF-0-2, (b) NCF-1-2, (c) NCF-1-1, (d) NCF-2-1 and (e) NCF-2-0.

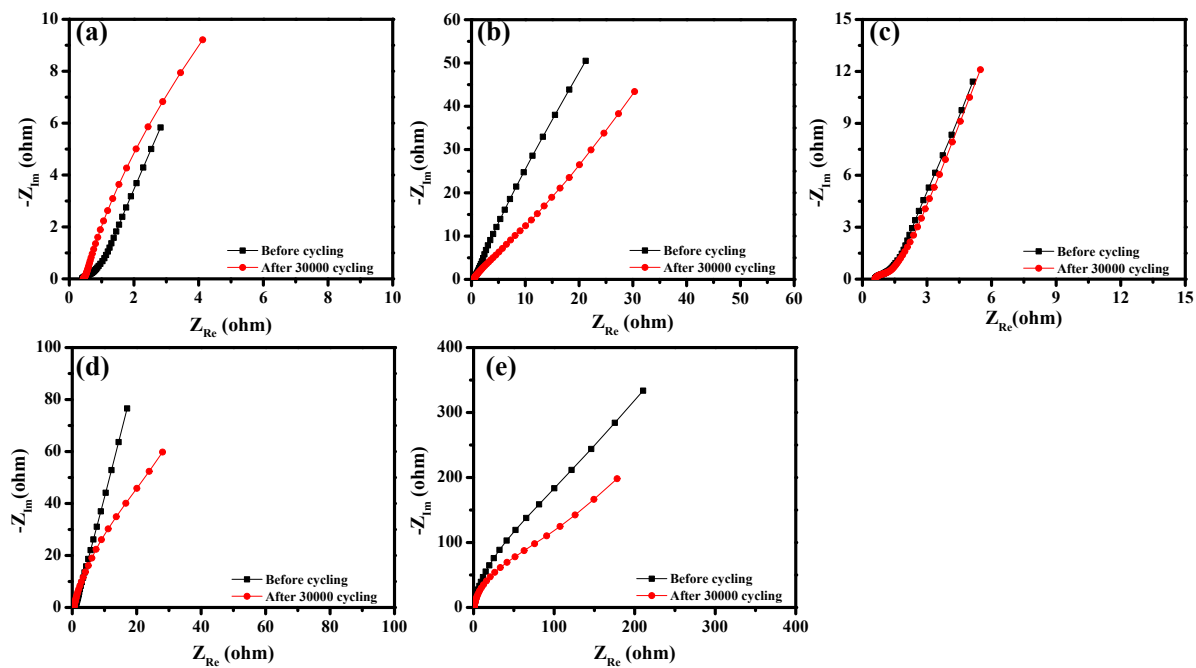


Fig. S8 Nyquist plots of (a) NCF-0-2, (b) NCF-1-2, (c) NCF-1-1, (d) NCF-2-1 and (e) NCF-2-0.

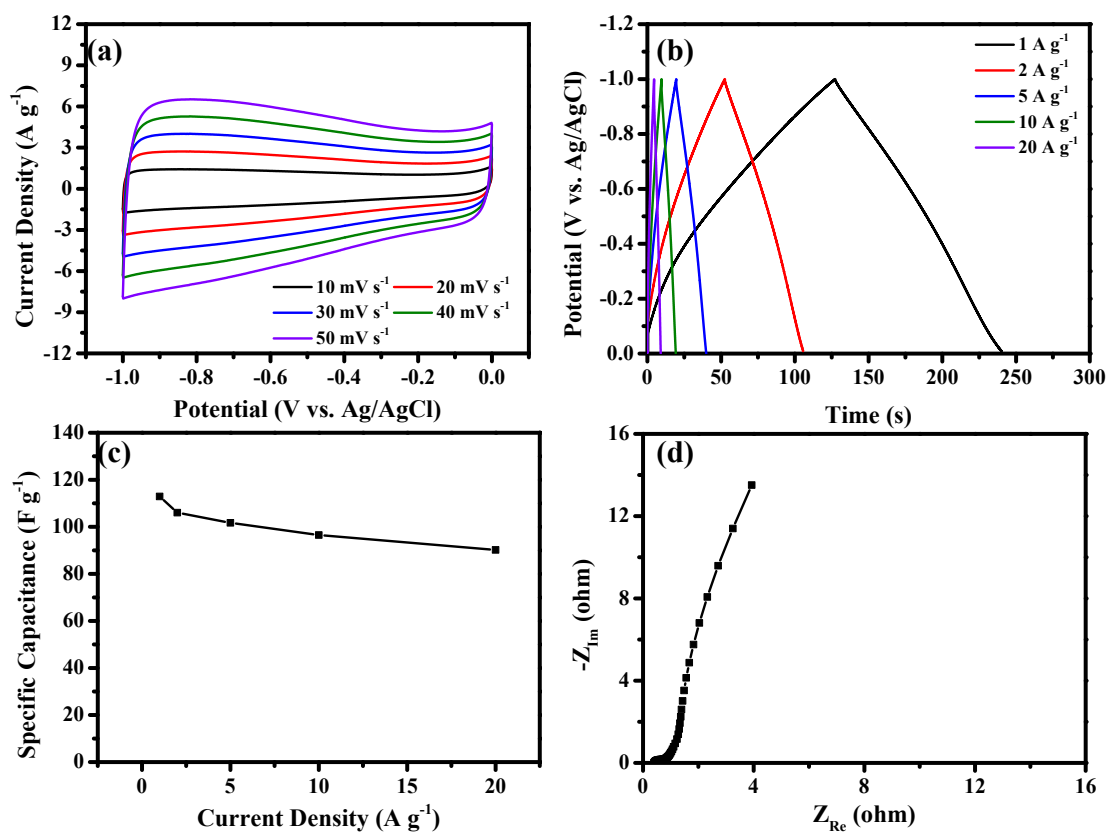


Fig. S9 The electrochemical performances of AC electrode. (a) CV curves at different scanning rates. (b) GCD curves at different current densities. (c) Specific capacitance as a function of current density and (d) Nyquist plots.

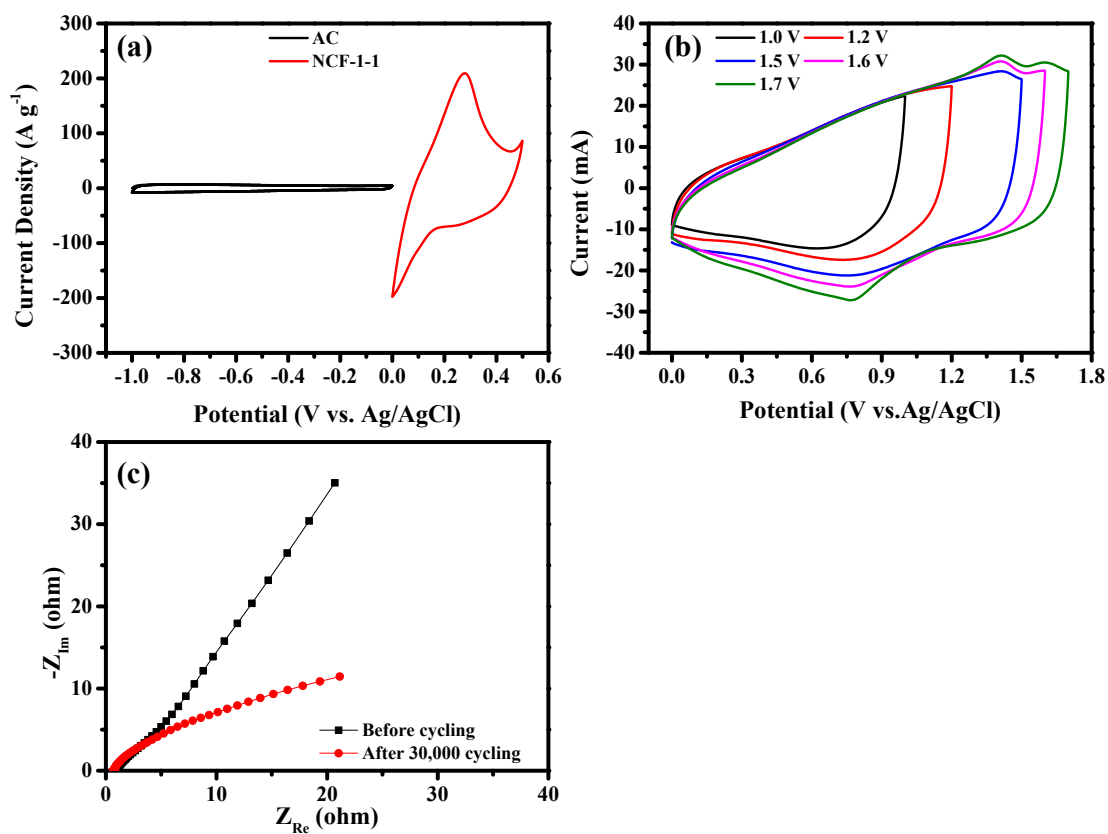


Fig. S10. The electrochemical performance of the asymmetric device NCF-1-1//AC. (a) CV profiles of the two electrodes at the same scan rate of 50 mV s^{-1} . (b) CV curves of the device with different voltage windows at the scan rate of 50 mV s^{-1} , and (c) EIS results of NCF-1-1//KOH//AC.

Table S3. Comparison of energy density and power density of different electrode materials

Materials	Energy density (Wh kg ⁻¹)	Power density (W kg ⁻¹)	References
C-doped CFMP//NG	53.2	399.7	Ref. 1
Co ₃ O ₄ //AC	46.5	790.7	Ref. 2
ZnCo ₂ O ₄ @Ni(OH) ₂ //AC	40.0	802.7	Ref. 3
NiMoO ₄ @NiS ₂ /MoS ₂ //AC	26.8	700	Ref. 4
NiCo ₂ S ₄ @NiS//AC	62.4	800	Ref. 5
N-GNTs@sd- Co ₉ S ₈ /Ni ₃ S ₂ //AC	45.1	3400	Ref. 6

References

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