Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.


# Hierarchical Nickel Cobalt Sulfide Nanosheet Arrays Supported on CuO/Cu Hybrid Foam as a Rational-Designed Core-Shell Dendrite Electrocatalyst for Efficient Oxygen Evolution Reaction

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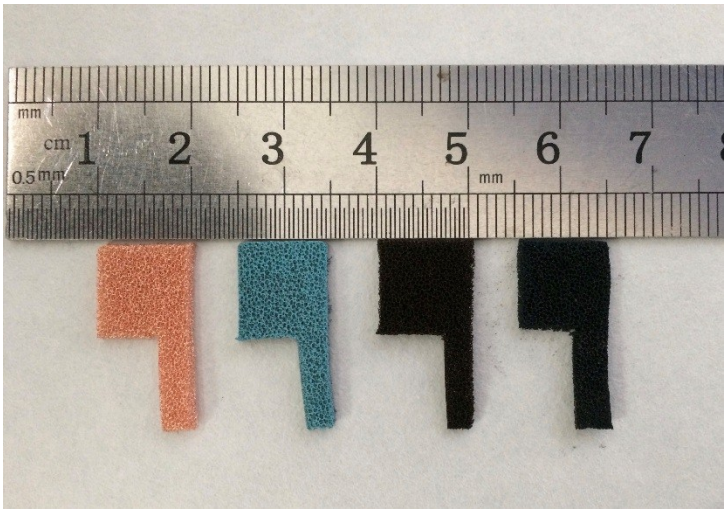


**Figure S1.** Optical pictures of as-prepared samples.

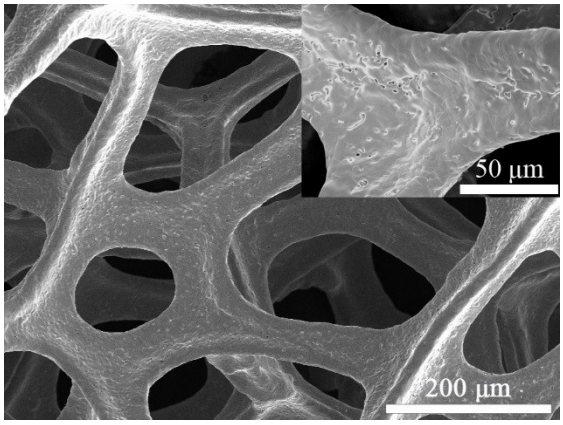


**Figure S2.** Typical SEM images of the blank Cu foam.

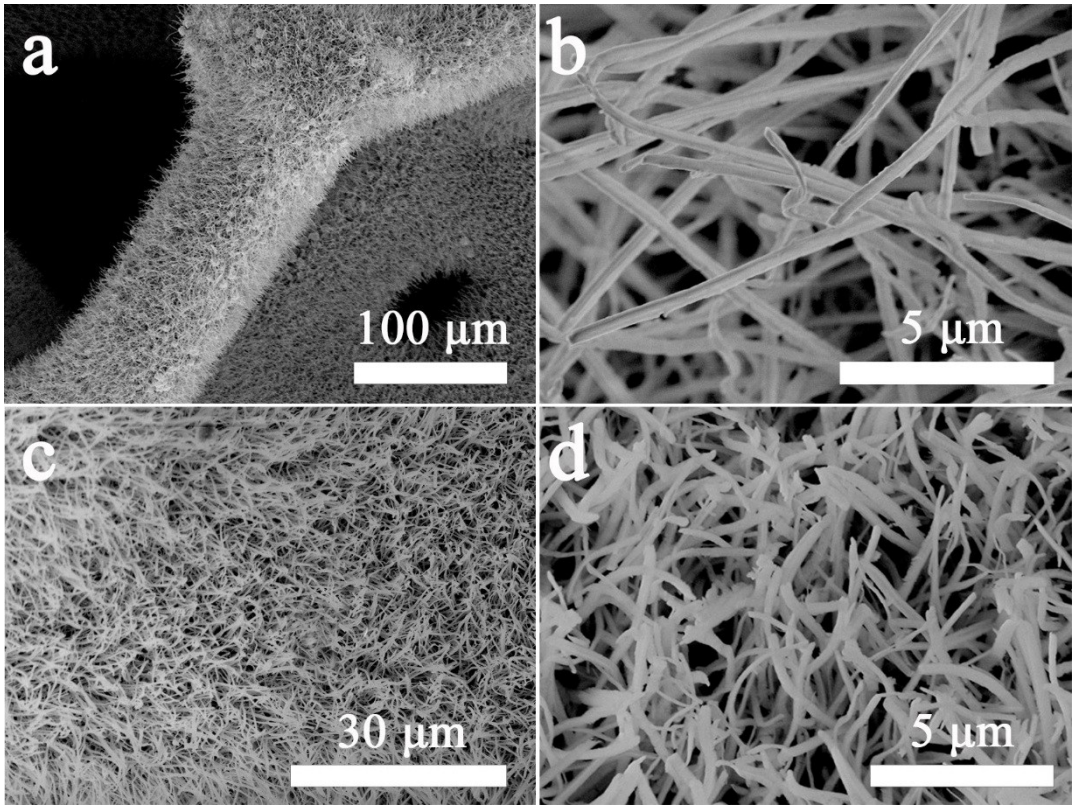


**Figure S3.** a, b) the SEM images of $Cu(OH)_2$ and c, d) CuO nanowires.

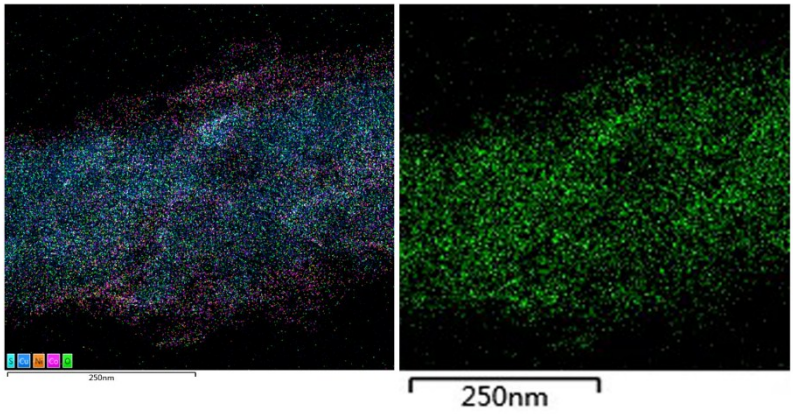


**Figure S4.** EDS elemental mapping image of O in the sample of Ni-Co-S@CuO/CF.

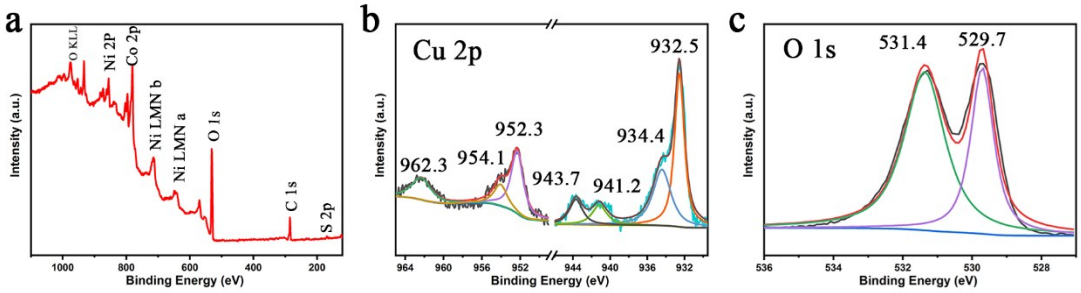


**Figure S5.** a) XPS full spectrum of Ni-Co-S@CuO/CF and high-resolution XPS profiles of b) Cu 2p and c) O 1s.

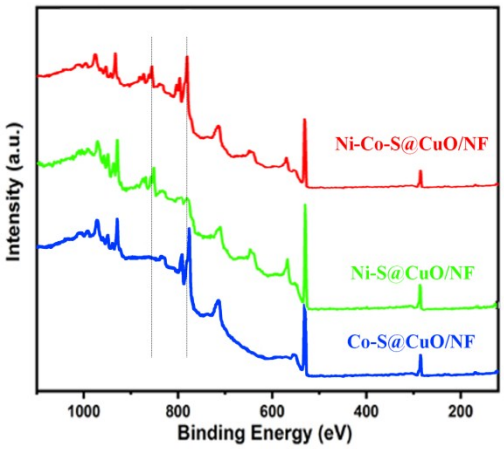


**Figure S6.** The XPS full spectra of Ni-Co-S@CuO/CF, Ni-S@CuO/CF and Co-S@CuO/CF.

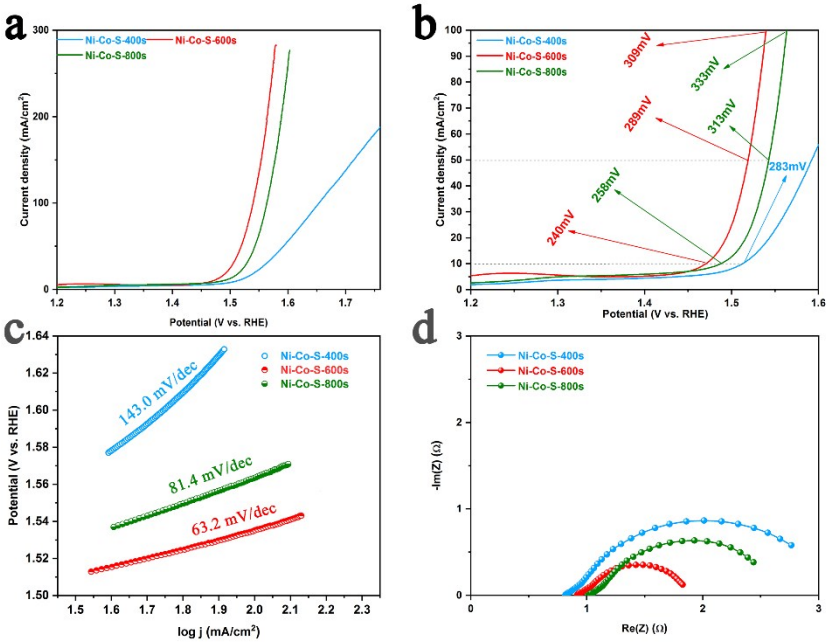


**Figure S7.** OER performance of Ni-Co-S-400s, Ni-Co-S-600s and Ni-Co-S-800s in 1.0 M KOH. (a, b) Polarization curves, (c) corresponding Tafel plots, and (d) EIS Nyquist plots (overpotential = 300 mV) for Ni-Co-S-400s, Ni-Co-S-600s and Ni-Co-S-800s.

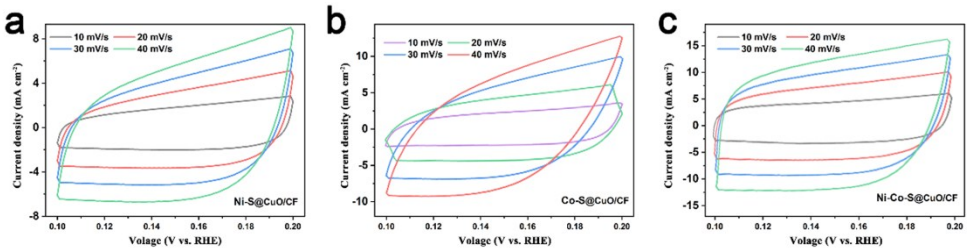


**Figure S8.** Typical cyclic voltammograms at different scan rate. a) Ni-S@CuO/CF, b) Co-S@CuO/CF and c) Ni-Co-S@CuO/CF at various scan rates from 5 to 40 mV/s in the potential range of 0.10-0.20 V.

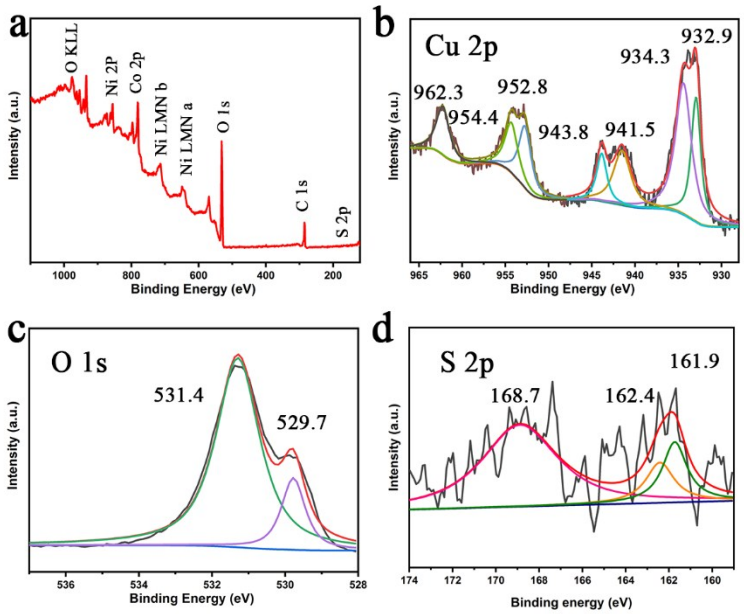


**Figure S9.** a) The XPS full spectrum of Ni-Co-S@CuO/CF after the OER stability test and high-resolution XPS profiles of b) Cu 2p, c) O 1s and d) S 2p.

**Table S1.** OER performances in KOH electrolyte: this work vs. literature.

| Catalyst | Electrolyte (KOH M) | $\eta_{10\ mA/cm2}$ (mV) | Reference |
|---|---|---|---|
| Ni-Co-S@CuO/CF | 1.0 | 240 | This work |
| $NiFe_2O_4$ NF | 0.1 | 440 | 1 |
| NiCo-LDH | 1.0 | 335 | 2 |
| $Co_3O_4$/CNFs | 1.0 | 330 | 3 |
| CoO | 1.0 | 269 | 4 |
| Ni-Co-S | 1.0 | 363 | 5 |
| NiO-Vo@2D/3D NS@DSE | 1.0 | 230 | 6 |
| Ni-Co-mixed oxide nanocages | 1.0 | 380 | 7 |
| $Ni_3S_2$/NF | 1.0 | 260 | 8 |

Reference


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