

Supporting Information:

Facile fabrication of hierarchical NiCoFeP hollow nanoprisms for efficient oxygen evolution in Zn-air battery

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Table S1. Comparison of the overpotential for the reported OER catalysts with NiCoFeP-HN*

catalyst	Overpotential (mV) at 10mA cm ⁻²	Reference
NiCoFeP-HN	294	This work
CoP/NCNHP	310	1
CoP	400	2
NiCoP/NC PHCs	297	3
NiCoP/C nanoboxe	330	4
Co-NC@CoP-NC	330	5
Co-P/Co-PO ₄	380	6
(Co/Fe) ₄ O ₄ Cubane	300	7
h-Co-MnOxP _{0.21}	370	8
NiCoP/C	297	9
Ni ₂ P/CoP	320	10
CoNi-P-NS	209	11
MnCoP nanoparticle	330	12
Co/MnO@GC-700	358	13
Co _{1.2} Fe/C	260	14
CoCx/FeCo@C/rGO	390	15
Ni _{0.75} Fe _{0.25} (OH) _x	310	16

*the OER test was examined on the glassy carbon electrode in 1.0 M KOH solution at room temperature.

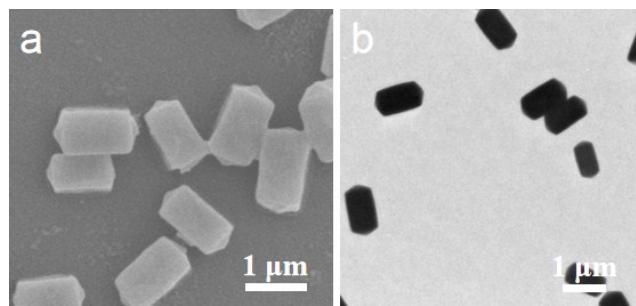


Fig. S1. (a) SEM and (b) TEM images of the Ni-Co precursor.

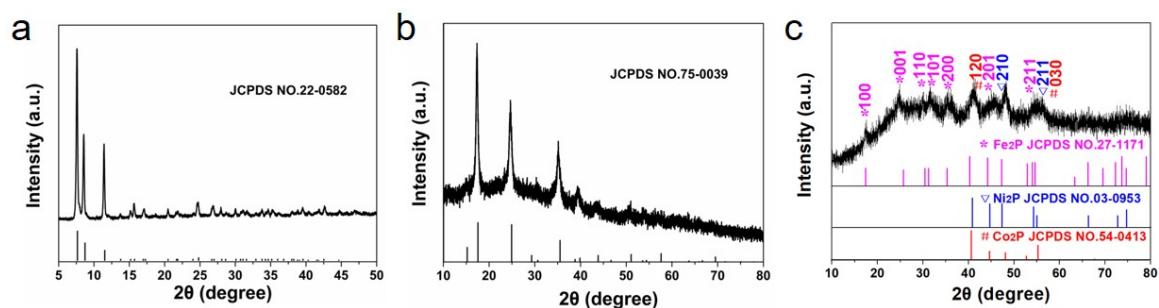


Fig. S2. XRD patterns of (a) the Ni-Co precursor, (b) NiCoFe-PBA-HN and (c) NiCoFeP-HN.

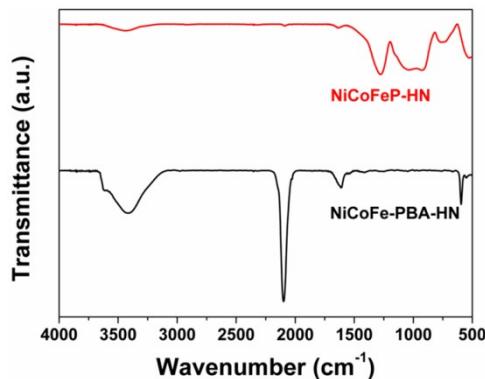


Fig. S3. FTIR spectra of the as-prepared NiCoFe-PBA-HN and NiCoFeP-HN samples.

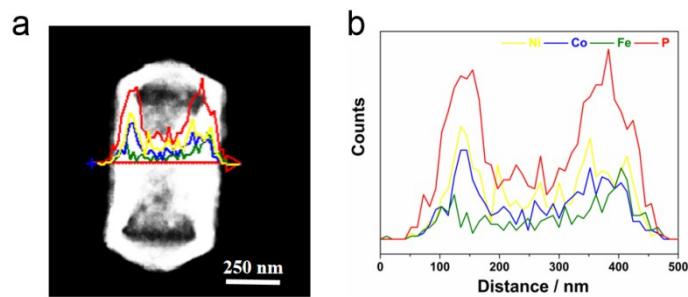


Fig. S4. (a) HAADF-STEM image and (b) EDX cross-sectional line scan profiles of the **NiCoFeP-HN**.

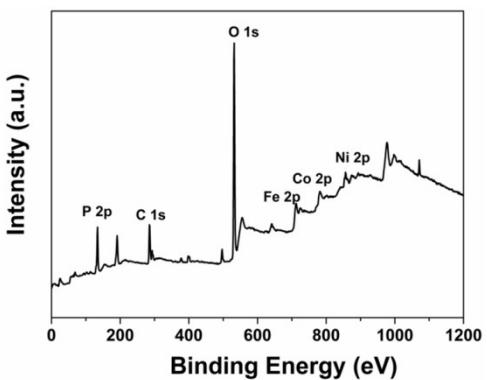


Fig. S5. XPS survey spectra of **NiCoFeP-HN**.

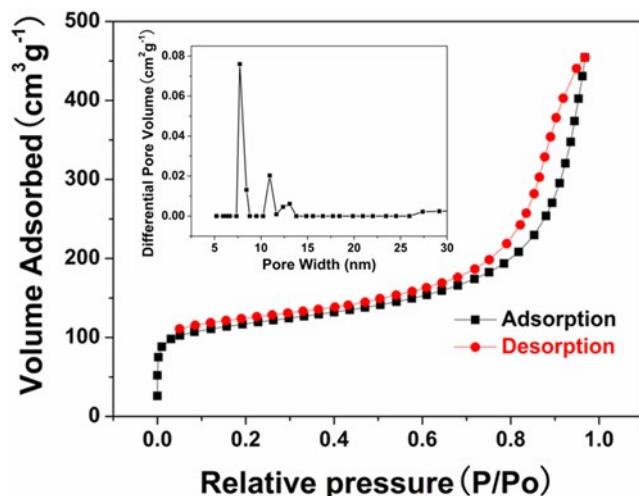


Fig. S6. N₂ adsorption-desorption isotherms and pore size distribution of the as-prepared **NiCoFeP-HN**.

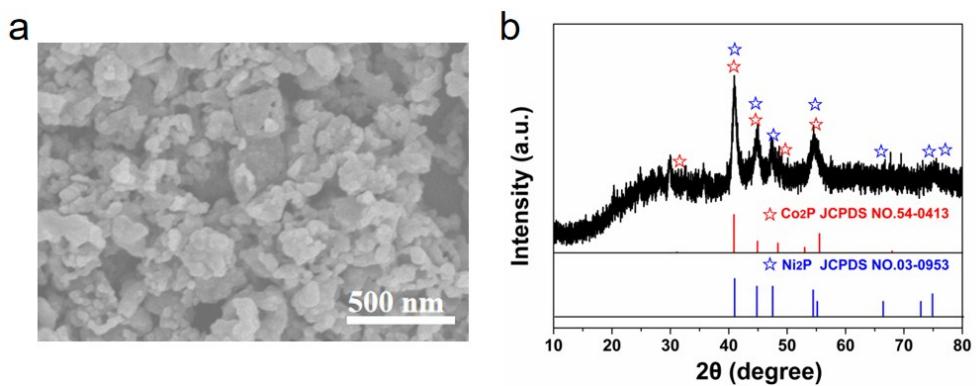


Fig. S7. (a) SEM image and (b)XRD patterns of the **NiCoP-NP**.

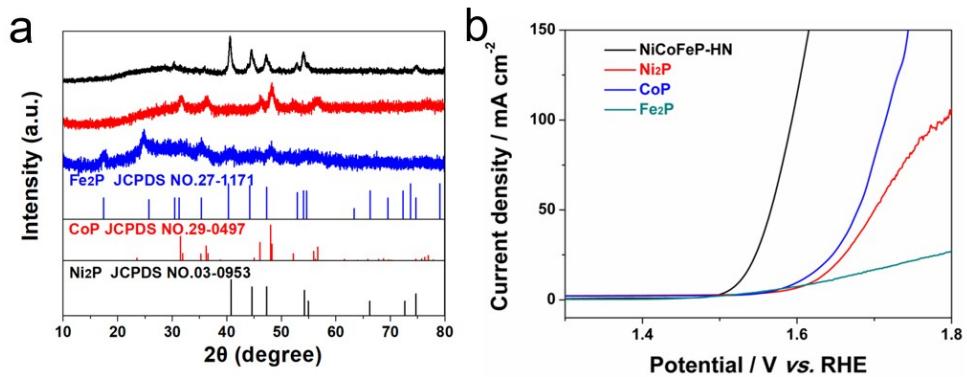


Fig. S8. (a) XRD pattern of the as-prepared Ni₂P, CoP and Fe₂P, (b) LSV curve of the as-prepared Ni₂P, CoP, Fe₂P and **NiCoFeP-HN** for OER.

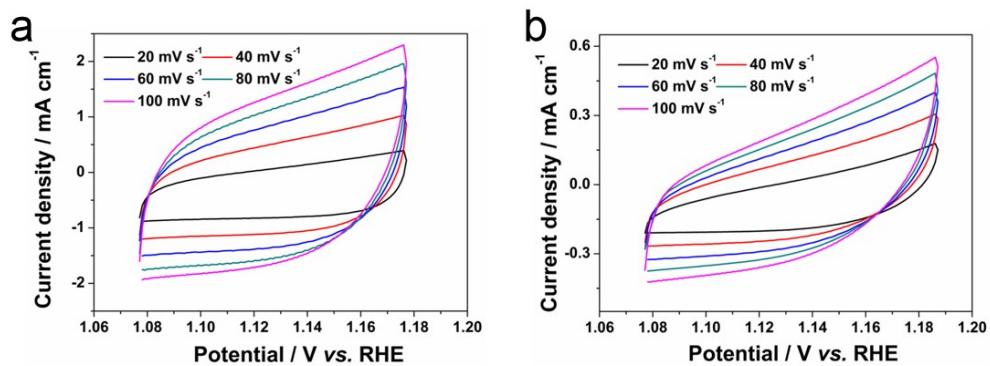


Fig. S9. Cyclic voltammogram (CV) curves of (a) **NiCoFeP-HN** and (b) **NiCoP-NP**.

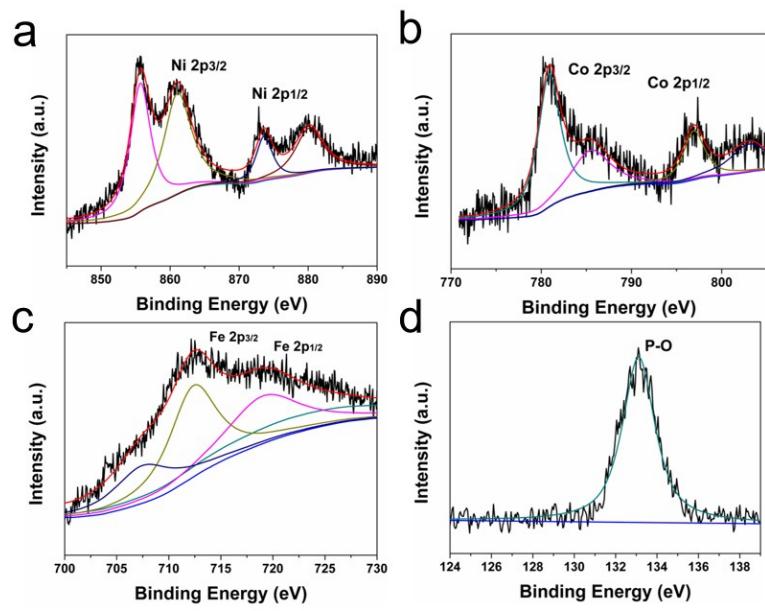


Fig. S10. XPS spectra of the NiCoFeP-HN after OER test: (a) Ni 2p, (b) Co 2p, (c) Fe 2p, and (d) P 2p.



Fig. S11. A LED lamp (~ 3.0 V) could be powered up by two Zn-air batteries in series with the NiCoFeP-HN + Pt/C catalyst as air-cathode.

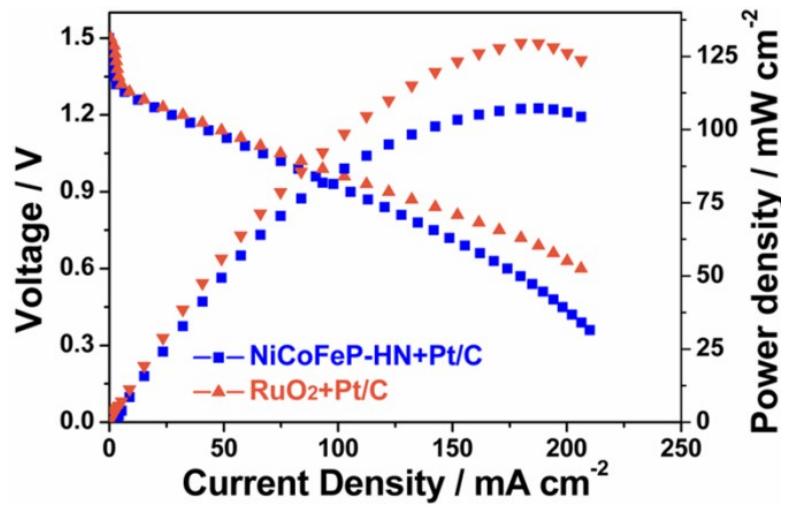


Fig. S12. Discharge polarization curves and the corresponding power density curves.

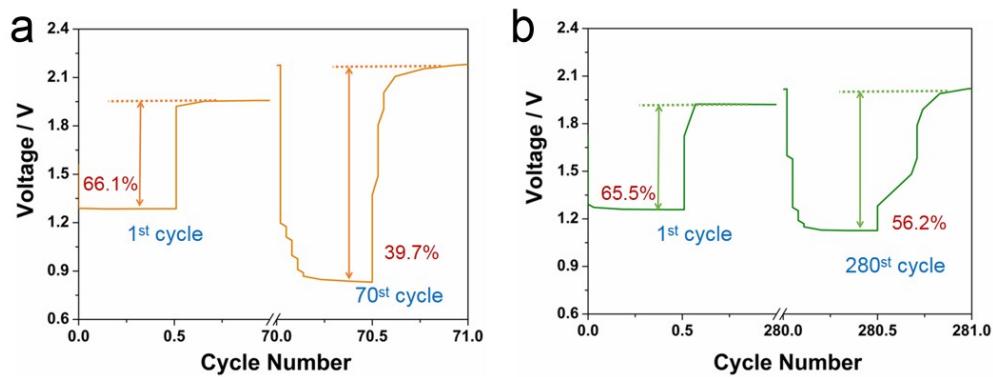


Fig. S13. The enlarged 1st and corresponding cycle of the discharge-charge voltage profiles of Zn-air batteries with (a) the $\text{RuO}_2 + \text{Pt/C}$ catalyst and (b) the $\text{NiCoFeP-HN} + \text{Pt/C}$ catalyst.

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