Supplementary Information

In Situ Grown NiFe-Based MOF for Efficient Oxygen Evolution in Alkaline Seawater at High Current Densities

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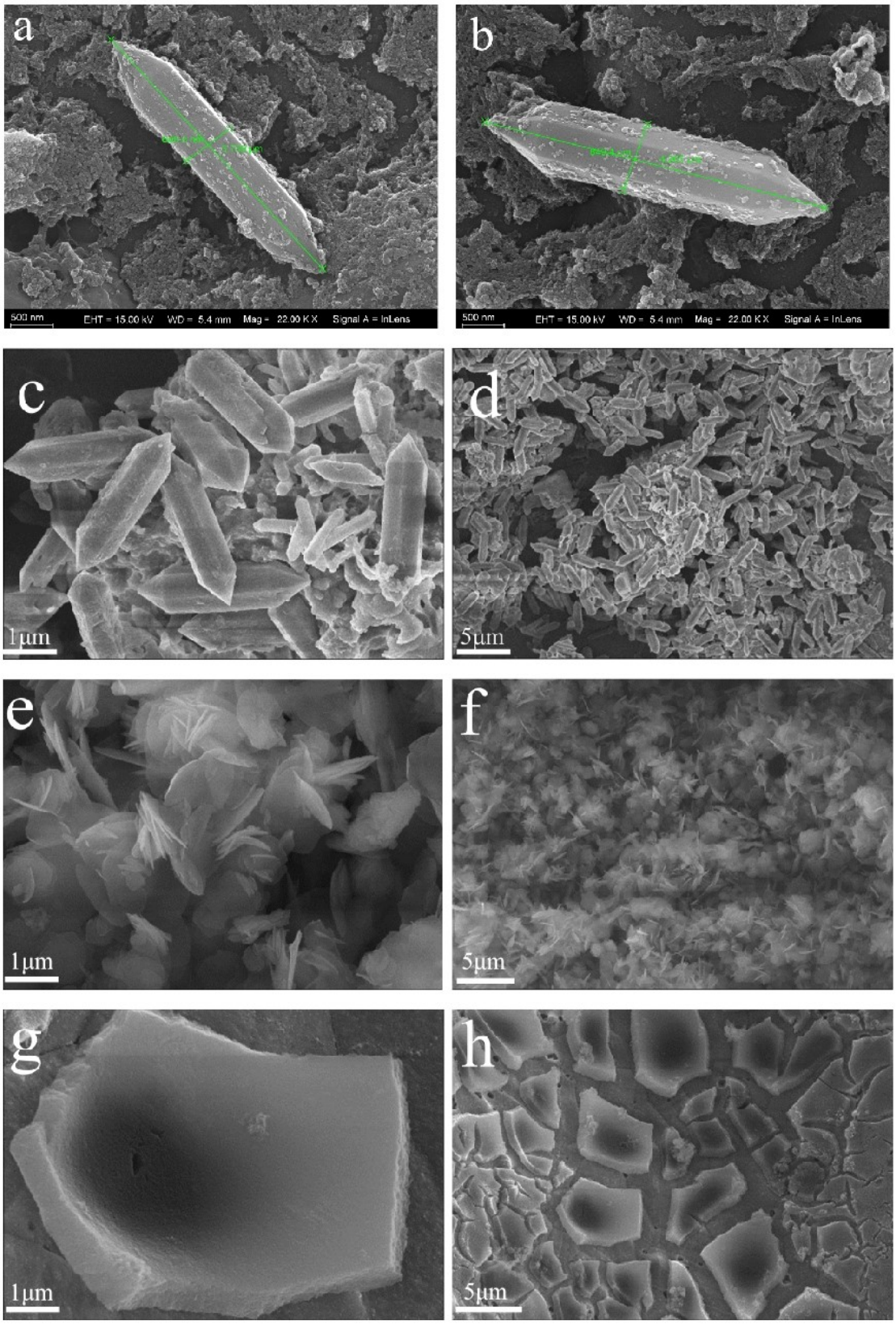

Fig. S1 SEM images of (a-d) bulk NFN-MOF, (e, f) Ni-MOF, and (g, h) Fe-MOF.

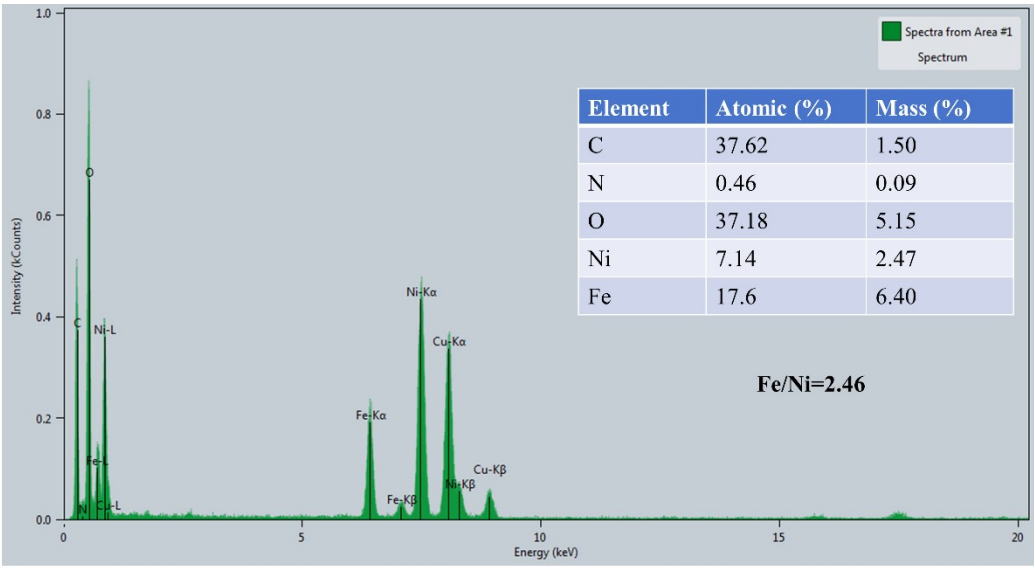

Fig. S2 TEM-EDX elemental composition of layered NFN-MOF.

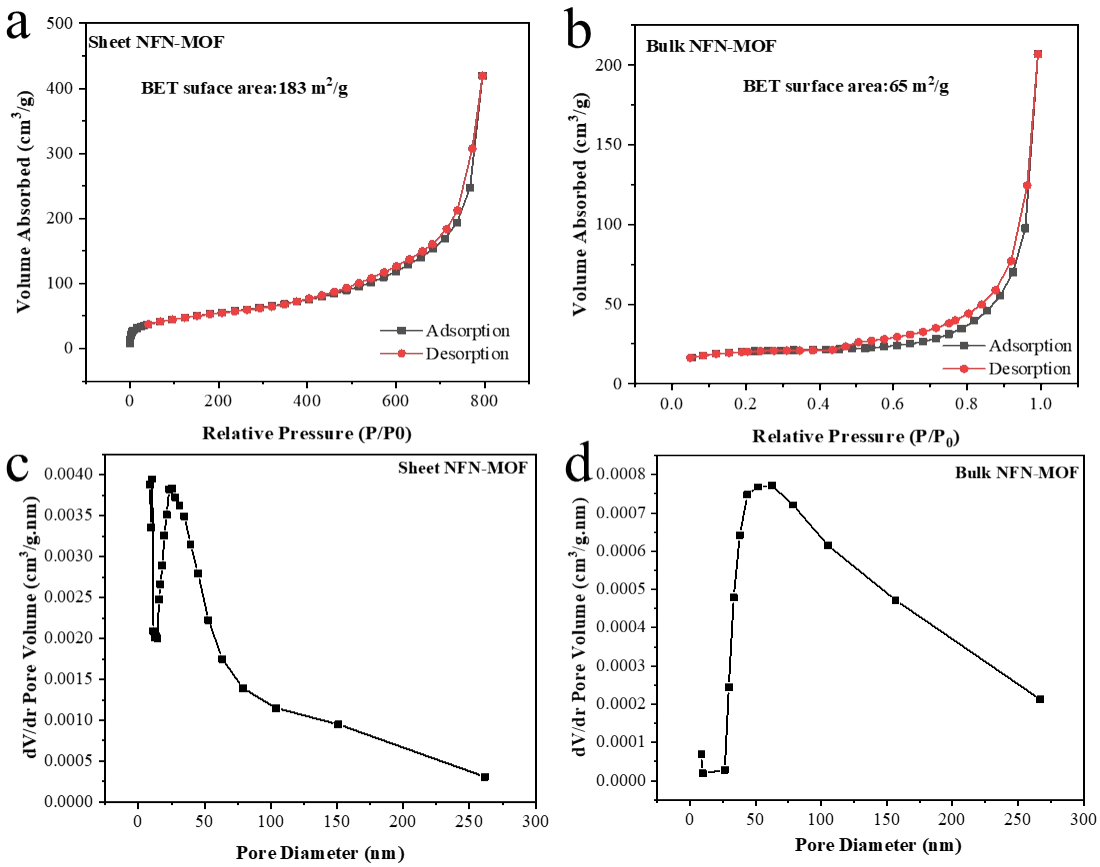

Fig. S3 N_2 adsorption-desorption isotherms of (a) sheet NFN-MOF and (b) bulk NFN-MOF. Pore size distribution of (c) sheet NFN-MOF and (d) bulk NFN-MOF.

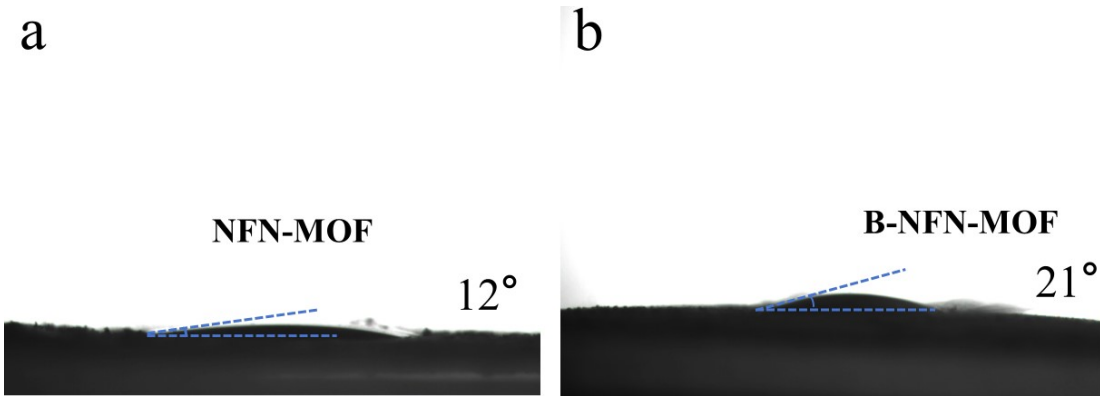

Fig. S4 Contact angle of (a) sheet NFN-MOF and (b) bulk NFN-MOF.

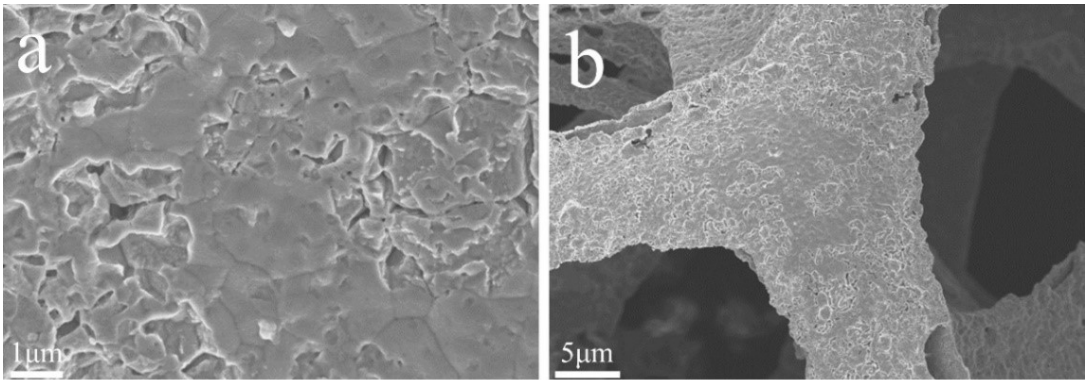

Fig. S5 SEM images of the NFN-MOF at (a) high and (b) low resolutions.

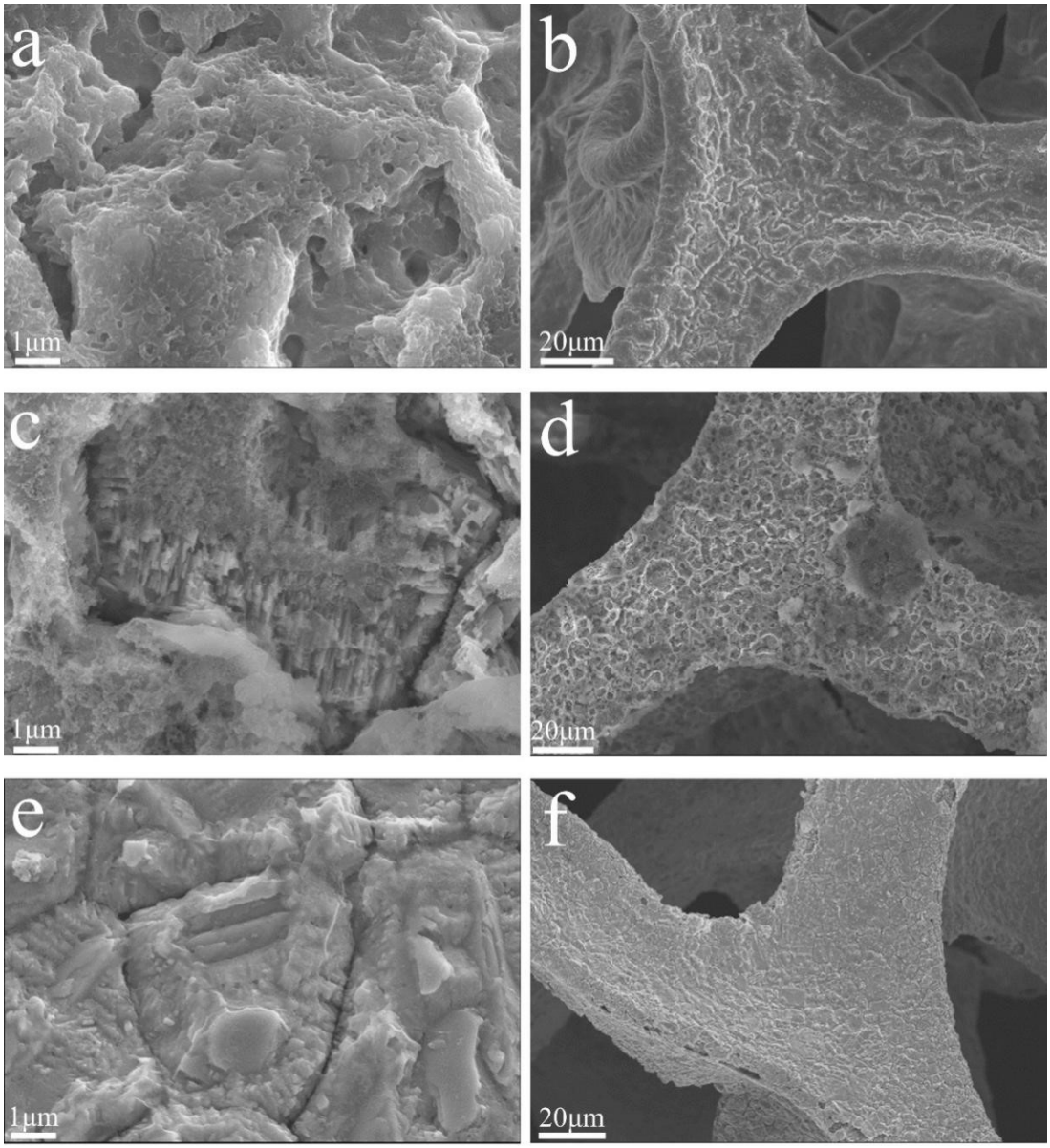

Fig. S6 SEM images of the NFN-MOF/NF after 100 hours of OER in (a, b) 1 M KOH, (c, d) 1 M KOH + 0.5 M NaCl and (e, f) 1 M KOH + Seawater at 200 mA cm^{-2} .

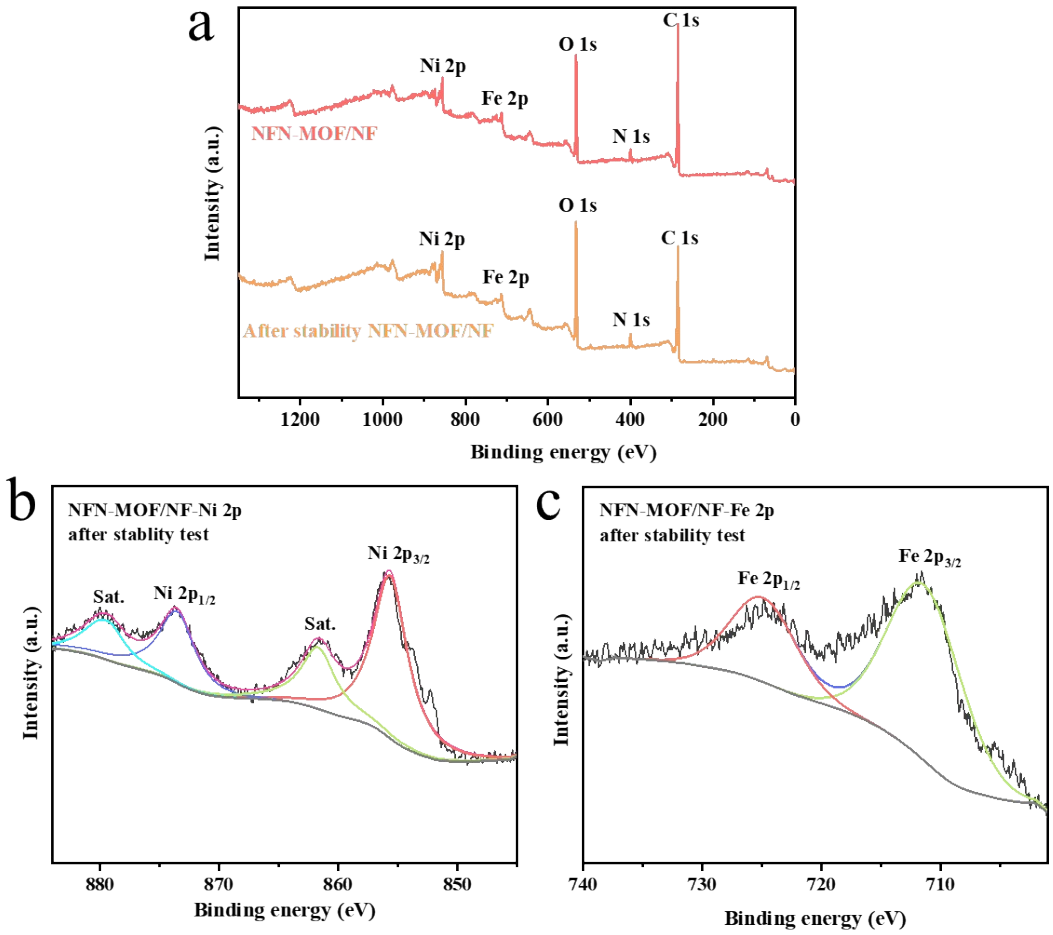

Fig. S7 (a) Full XPS measurement spectra and corresponding high-resolution XPS spectra of (b) Ni 2p and (c) Fe 2p of NFN-MOF/NF after 100 h of chronopotential (V-t) testing at 200 mA cm^{-2}.

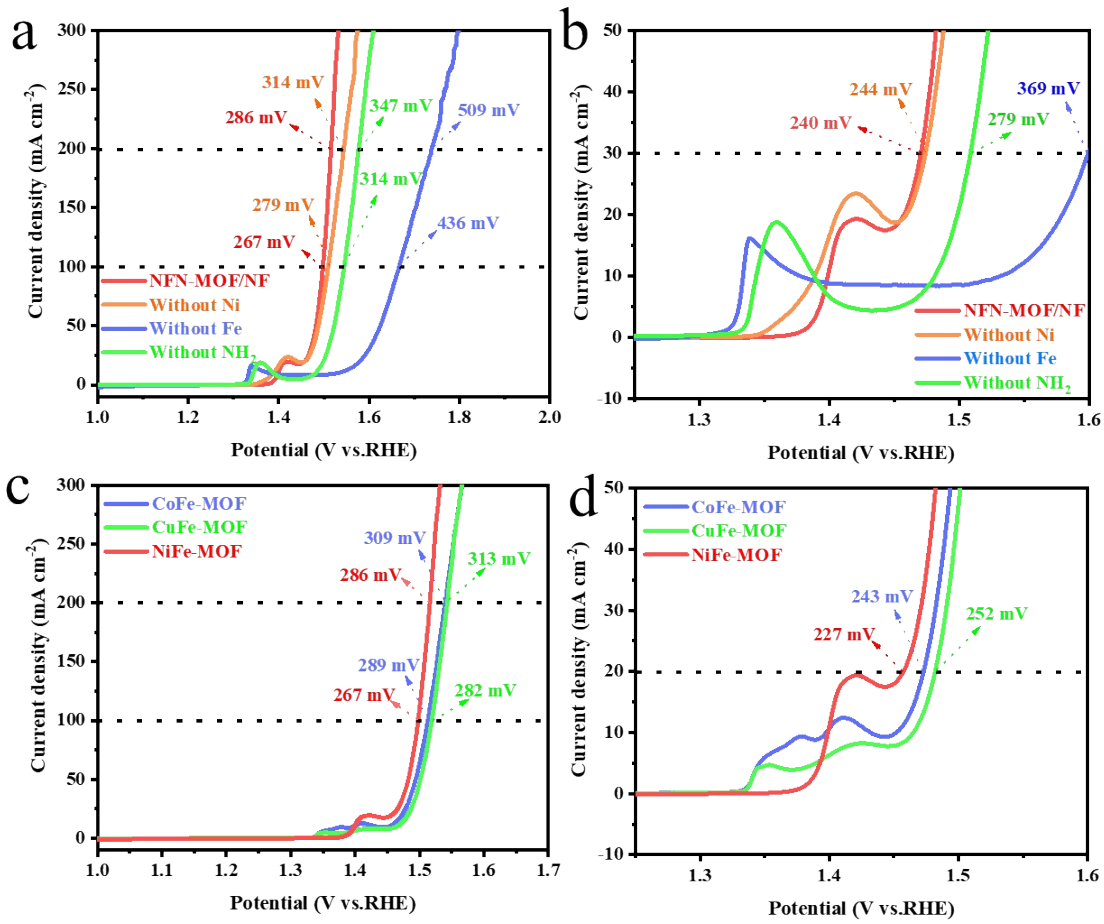

Fig. S8 LSV curves of OER of (a, b) NFN-MOF/NF, comparison electrodes and (c, d) M-Fe-NH_2 MOF (M = Ni/Fe/Co) in 1 M KOH solution.

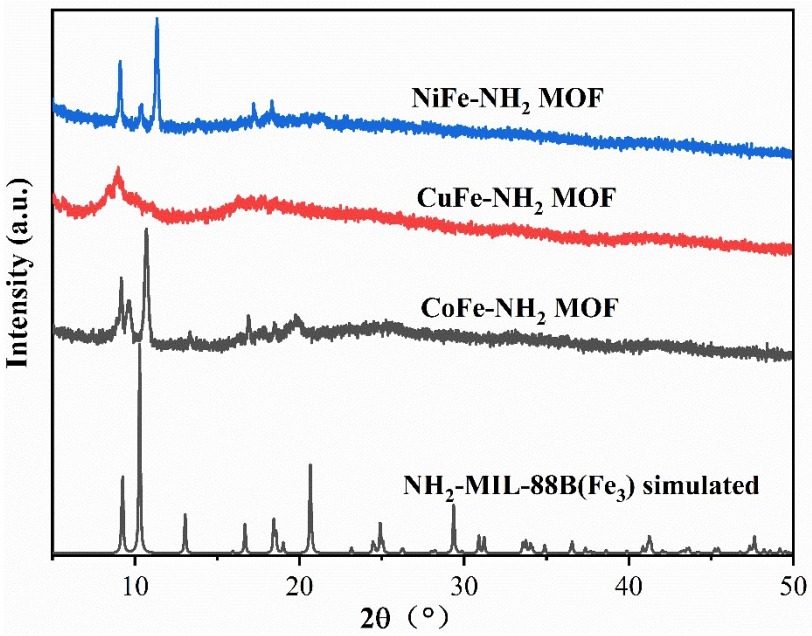

Fig. S9 Powder XRD patterns of M-Fe-NH_2 MOF (M = Ni/Fe/Co).

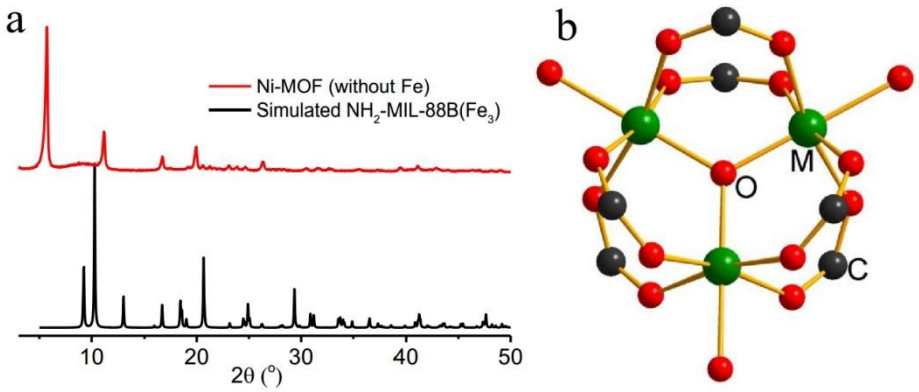

Fig. S10 (a) Powder XRD patterns of Ni-MOF (without Fe). Reprinted from Ref. 31 of the manuscript. (b) Structural representation of $[M_3O(COO)_6(H_2O)_3]$ cluster in MIL-88 MOF family. Reprinted from Ref. 31 of the manuscript.

Table S1. Comparison of BET surface area between NFN-MOF and recently reported NiFe based electrocatalysts.

Material	BET surface area (m^2 g^{-1})	Reference
Sheet NFN-MOF	183.0	This work
Bulk NFN-MOF	65.0	This work
NiFe-MOF-c	359.0	[1]
NiFe-MOF-a	285.0	[1]
ZIF-8@Fe/Ni	195.2	[2]
NiFe(1:1)O_x@C	168.5	[3]
Graphene-based FeO/NiO MOF	123.2	[4]
NiFe(1:1)-LDH-MOF	109.4	[3]
$NiFe_{op}$AHC	62.9	[5]
Fe-Ni-MOF	16.7	[6]
NiFe-MOF	9.2	[5]

References

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