Supporting Information

Construction of FeOOH modified CoM$_x$O$_y$ (M = Mo, W, V) on Nickel Foam for Highly Efficient Oxygen Evolution Reaction

Tingting Wen, Limin Wang*, Yaqiong Gong*

School of Chemical Engineering and Technology, North University of China, Taiyuan, 030051, P. R. China

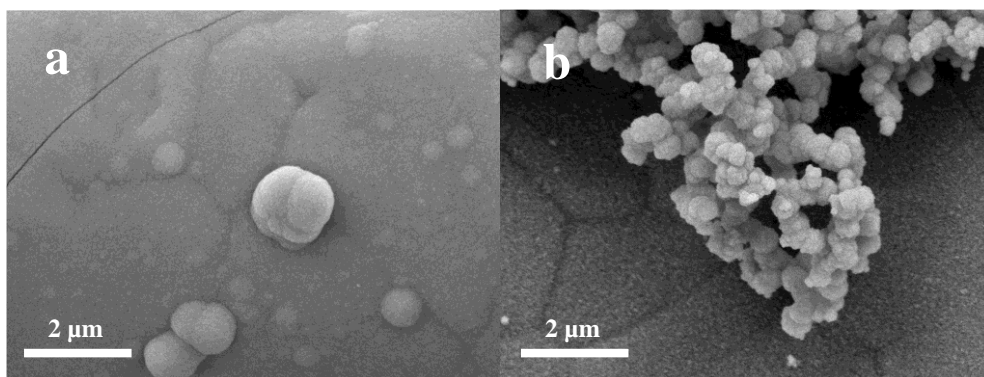** Email: wanglimin@nuc.edu.cn (Limin Wang); gyq@nuc.edu.cn (Yaqiong Gong)*

Fig. S1 SEM images of $Co_3(VO_4)_2$/NF and $CoWO_4$/NF.

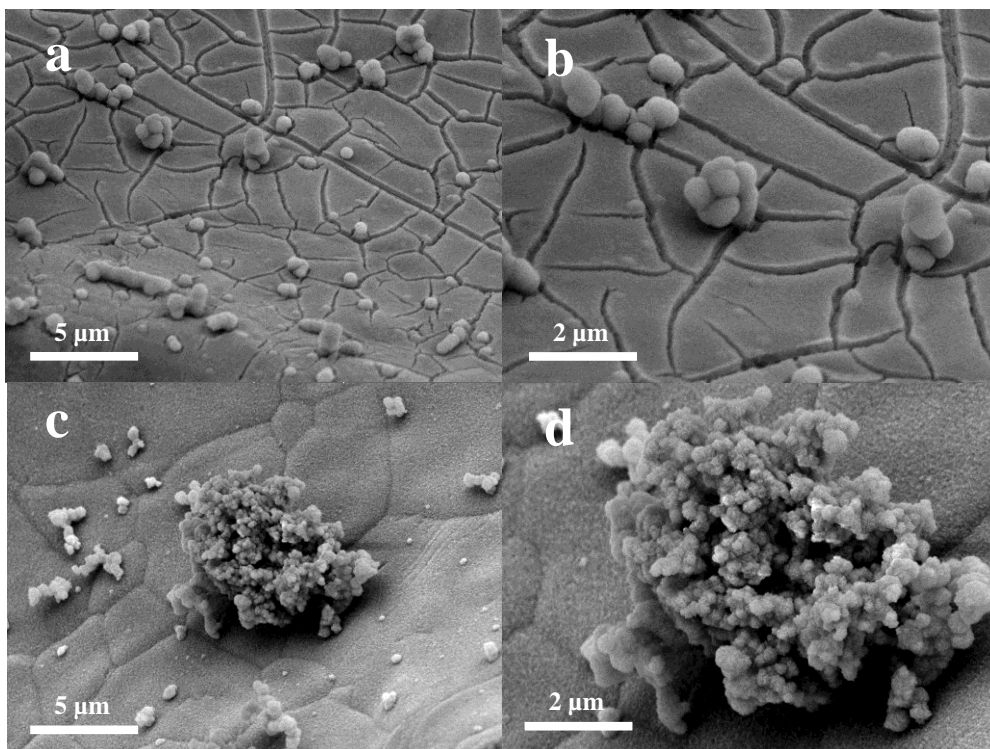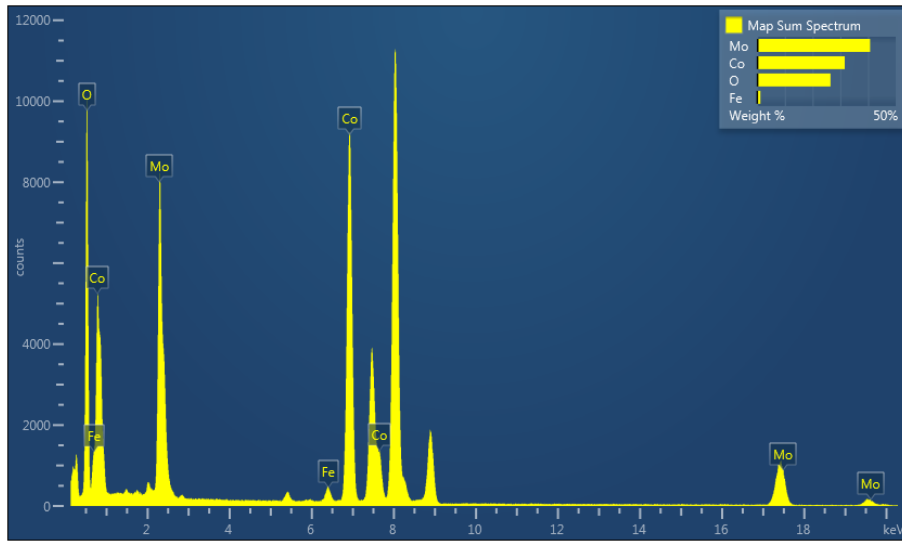**Fig. S2** SEM images of (a and b) FeOOH-Co$_3$(VO$_4$)$_2$/NF, (c and d) FeOOH-CoWO$_4$/NF.

Fig. S3 The element composition of FeOOH-CoMoO₄/NF.

Table S1 Elemental composition of Fe, Co, Mo and O

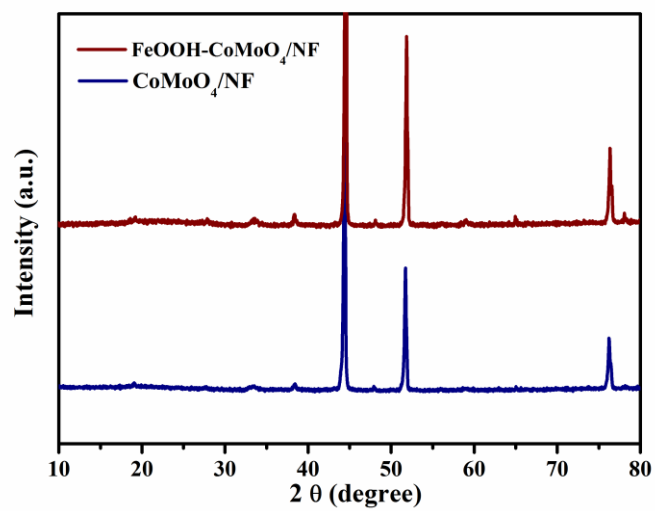| Element	Fe	Co	Mo	O
Atom/%	0.8	20.35	16.11	62.74

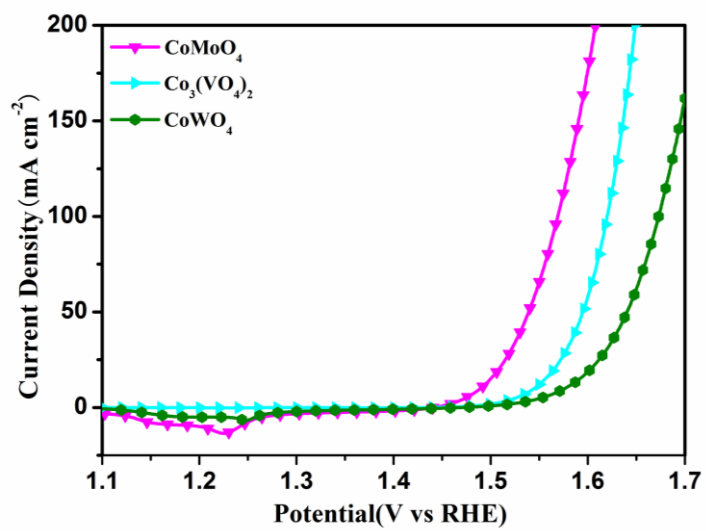**Fig. S4** XRD patterns of FeOOH-CoMoO$_4$/NF and CoMoO$_4$/NF.

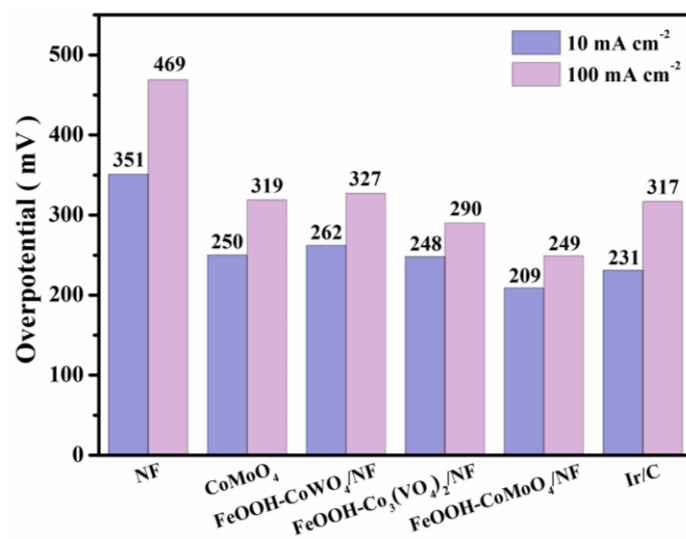**Fig. S5** The LSV of CoMoO₄/NF, Co₃(VO₄)₂/NF, and CoWO₄/NF.

Fig. S6 Comparison of overpotential required at 10 mA cm^{-2} and 100 mA cm^{-2}.

Table S2 Comparison of OER activity between FeOOH-CoMoO$_4$/NF and other recently reported non-noble metal catalysts in 1M KOH

Catalyst	η10 (mV)	Reference
FeOOH-CoMoO$_4$/NF	218	This work
Ni-Fe LDH/CNT	247	J. Am. Chem. Soc. 2013, 135, 8452-8455.
CoO$_x$	306	Nano Energy 2018, 43, 110-116.
a-NiFeO$_x$H$_y$@NF	239	Nano Res. 2018, 11, 3959-3971.
FeOOH@Co$_3$O$_4$	228	J. Colloid Interface Sci. 2022, 623, 617-626
FeOOH/CoP	250	Chem. Eng. J. 2022, 428, 131130.
NiCo$_2$O$_4$ ultrathin nanosheets	320	Angewandte Chemie 2015, 127, 7507-7512.
CoNiN@NiFe-LDH	227	Appl. Surf. Sci. 2021, 570, 151182.
FeOOH-NiCoMo	265	Adv. Mater. 2018, 30, 1803144.
Co/NCP@NiCo LDHs	277	J. Alloys Compd. 2022, 890, 161805.
γ-FeOOH NAs	286	Adv. Mater. 2021, 33, 2005587.
CoMnP nanoparticles	330	J. Am. Chem. Soc. 2016, 138, 4006-4009.

Table S3 Charge transfer resistance (R_{ct}) values of different samples.

Sample	R_{ct} (Ω)
FeOOH-CoMoO$_4$/NF	1.521
FeOOH-Co$_3$(VO$_4$)$_2$/NF	2.259
FeOOH-CoWO$_4$/NF	3.395
CoMoO$_4$/NF	16.26
NF	46.96
Ir/C	5.37

Fig. S7 Cyclic voltammetry curves of (a) NF, (b) CoMoO$_4$/NF, (c) FeOOH-CoWO$_4$/NF, (d) FeOOH-Co$_3$(VO$_4$)$_2$/NF and (e) FeOOH-CoMoO$_4$/NF.
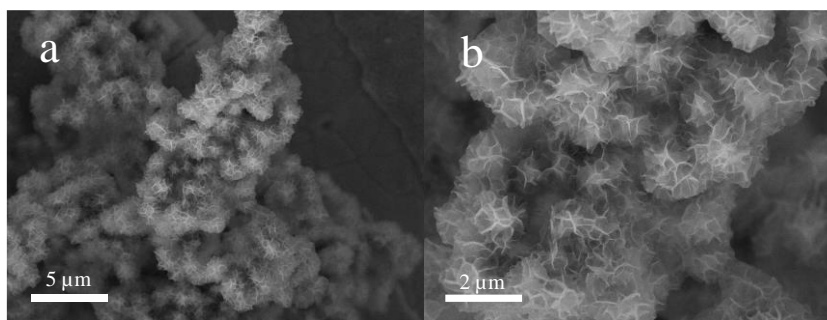
Fig. S8 SEM images after the stability test of FeOOH-CoMoO$_4$/NF.
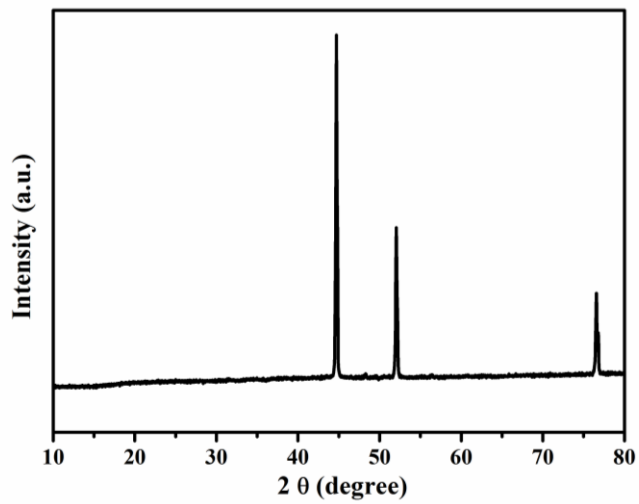
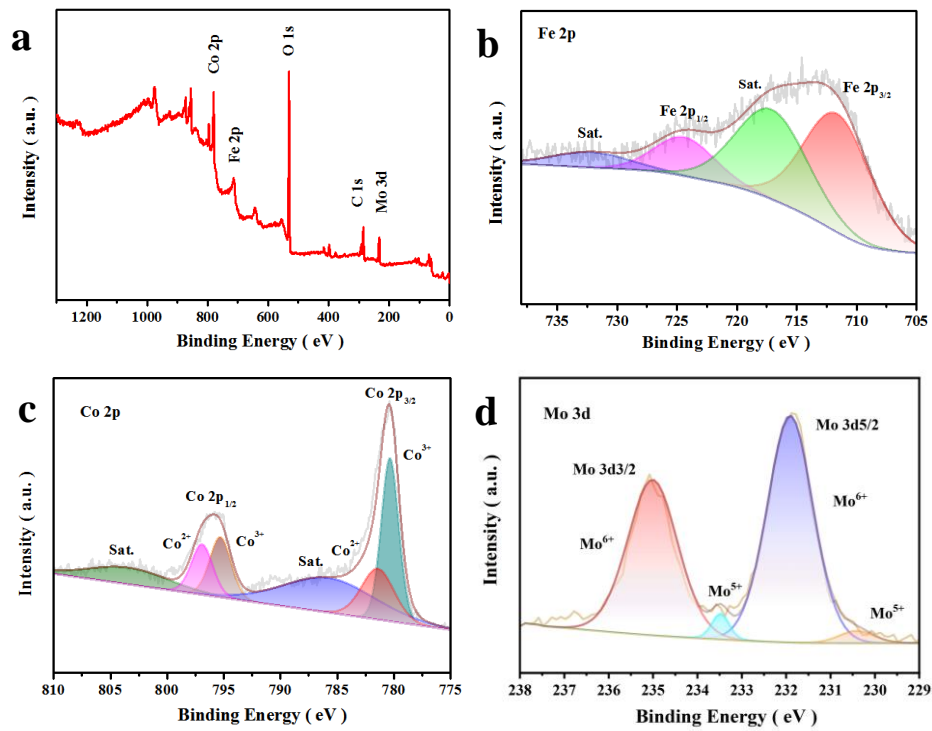**Fig. S9** XRD pattern of FeOOH-CoMoO$_4$/NF after OER stability test.

Fig. S10 XPS spectra of FeOOH-CoMoO₄/NF after OER stability test (a) survey, (b) Fe 2p, (c) Co 2p, (d) Mo 3d.