Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting Information

Self-supporting NiMo-Fe-P nanowire arrays as bifunctional catalysts for efficient overall water splitting

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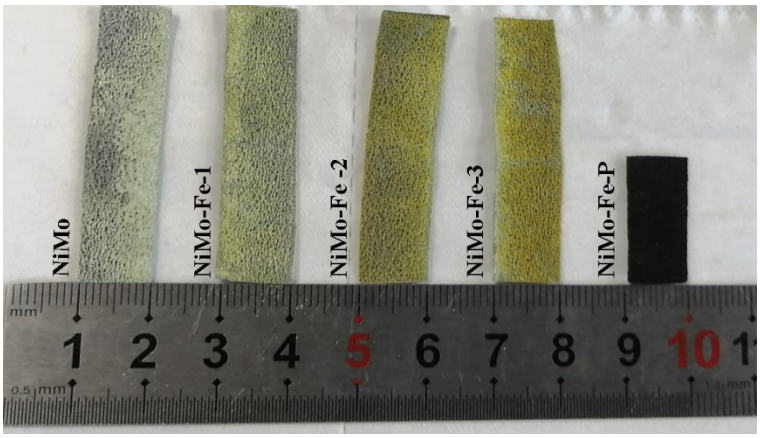

Fig. S1. Color change of nickel foam.

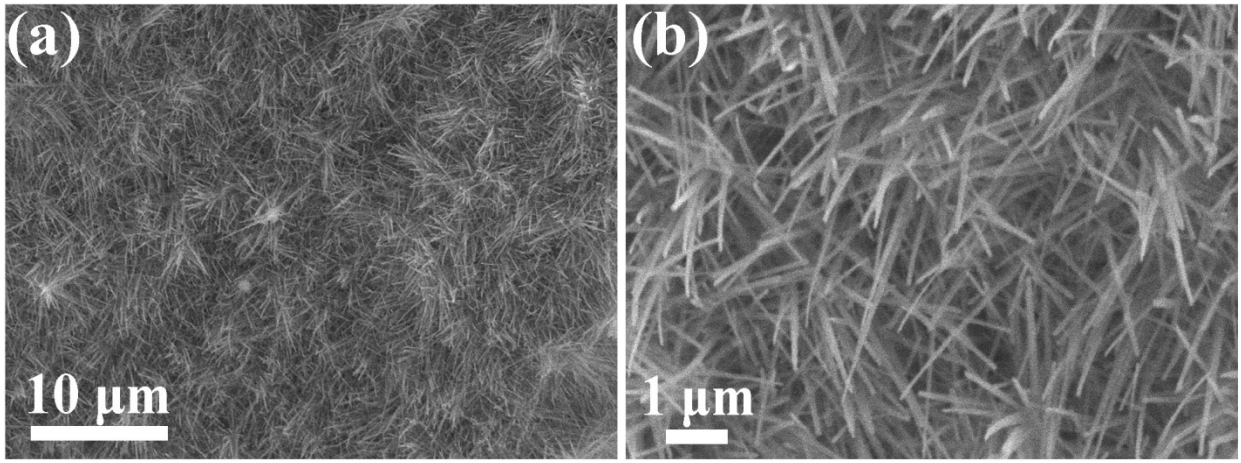

Fig. S2. SEM images of NiMo.

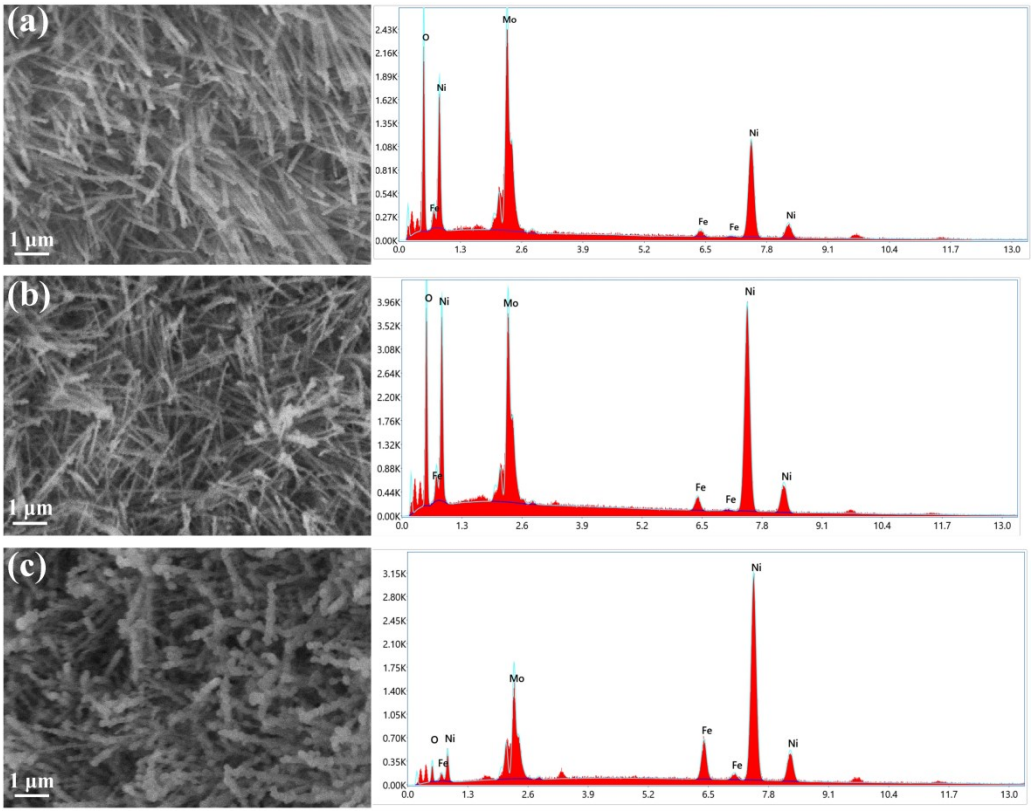

Fig. S3. SEM images and EDS of (a) NiMo-Fe-1; (b) NiMo-Fe-2; (c) NiMo-Fe-3.

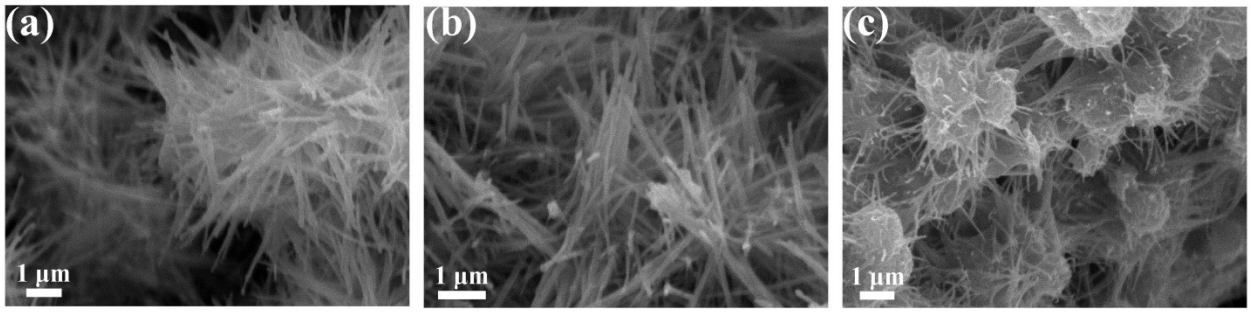

Fig. S4. SEM images of (a) NiMo-P; (b) NiMo-Fe-1-P; (c) NiMo-Fe-3-P.

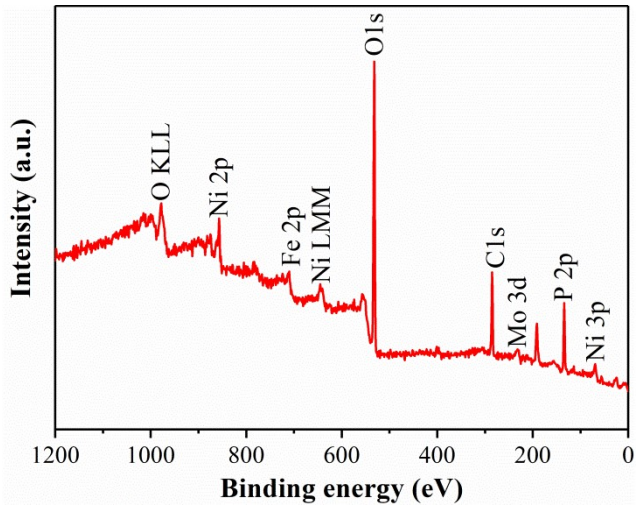

Fig. S5. XPS survey spectra analysis of NiMo-Fe-2-P.

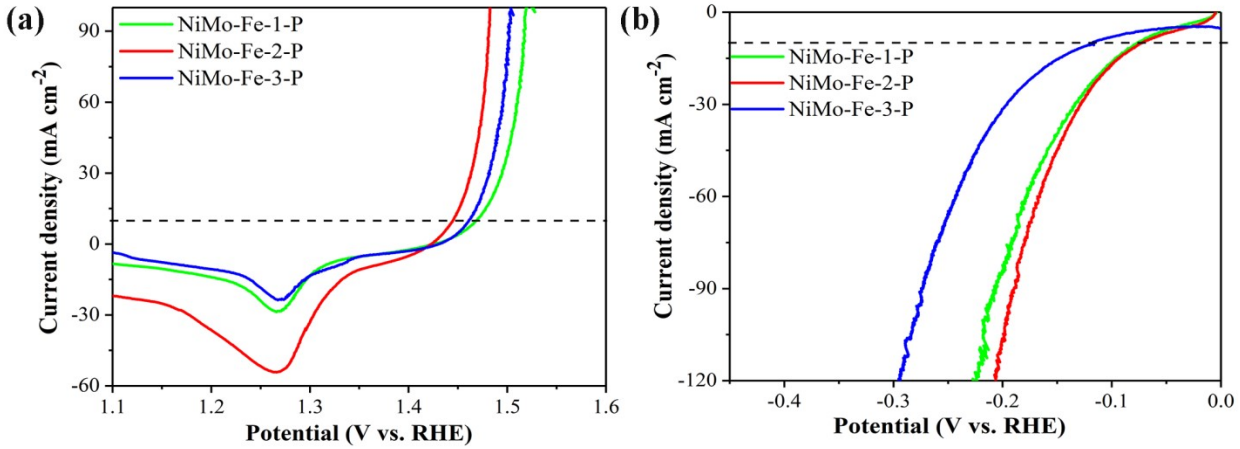

Fig. S6. LSV curves of (a) OER and (b) HER.

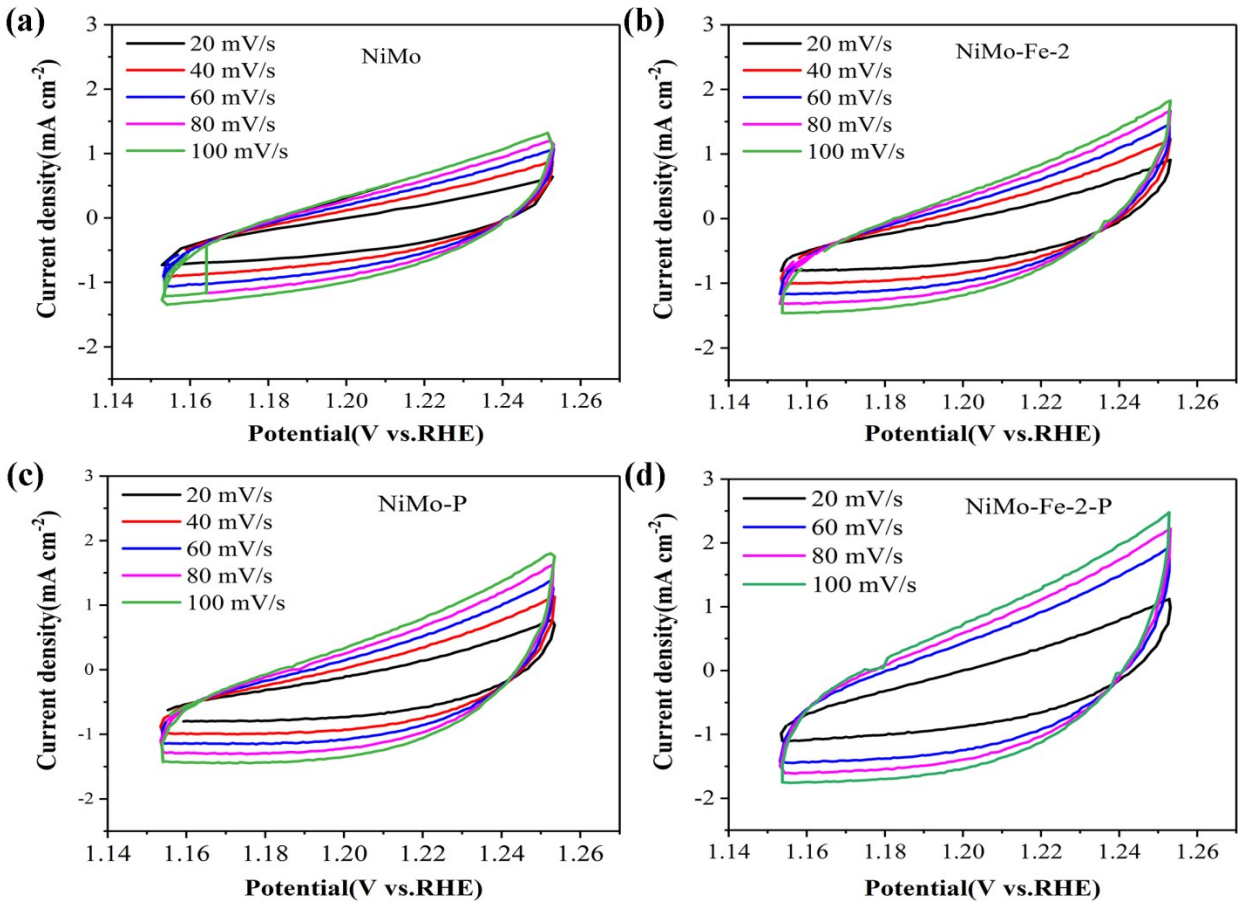

Fig. S7. CV curves of different samples with various scan rates (OER).

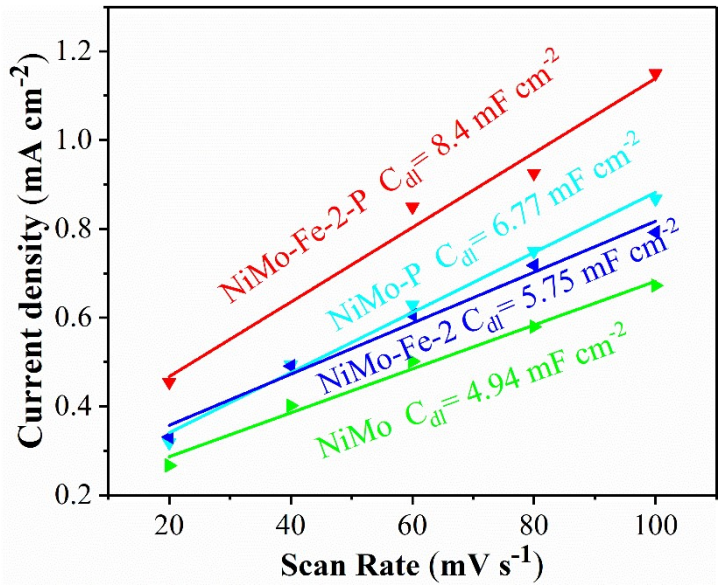

Fig. S8. C_{dl} comparison of different samples (OER).

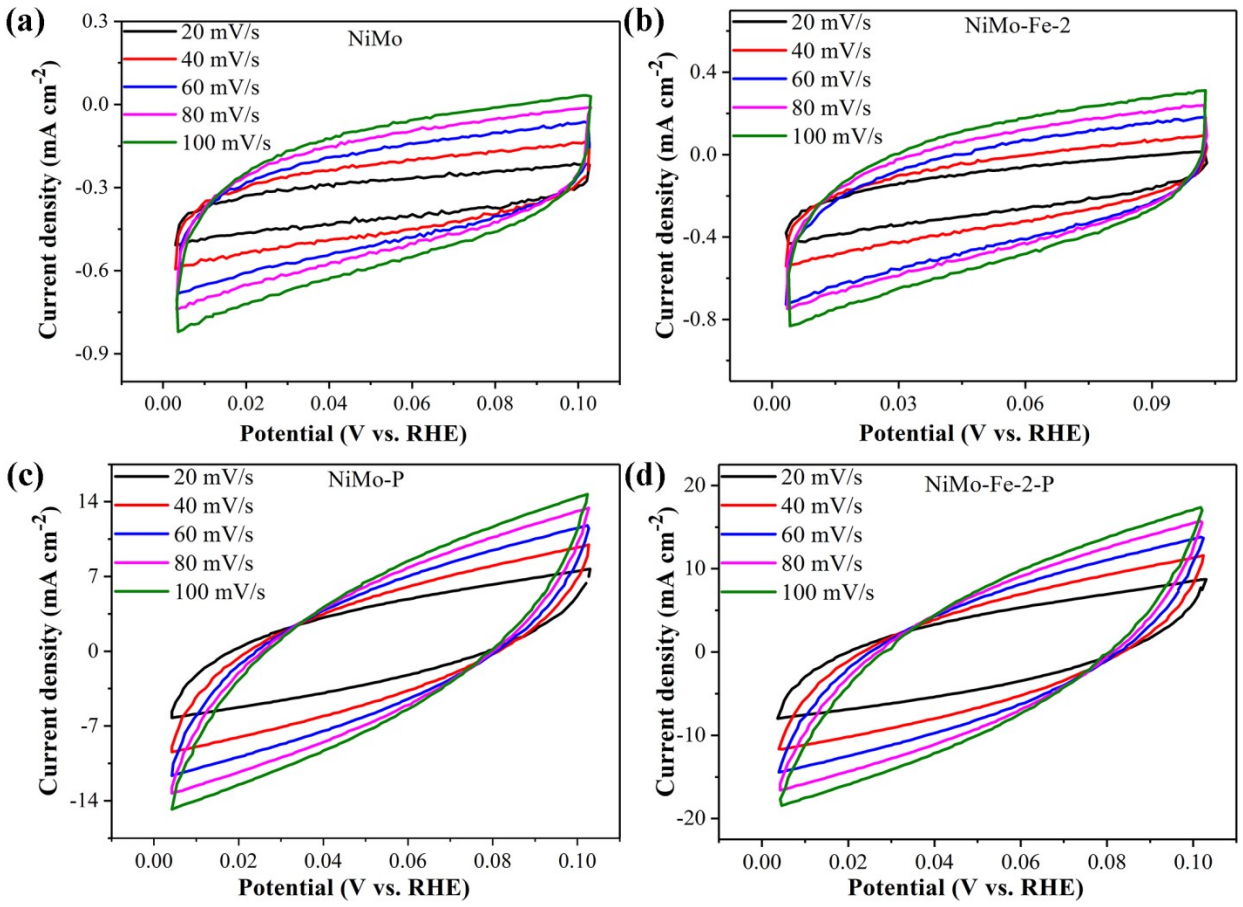

Fig. S9. CV curves of different samples with various scan rates (HER).

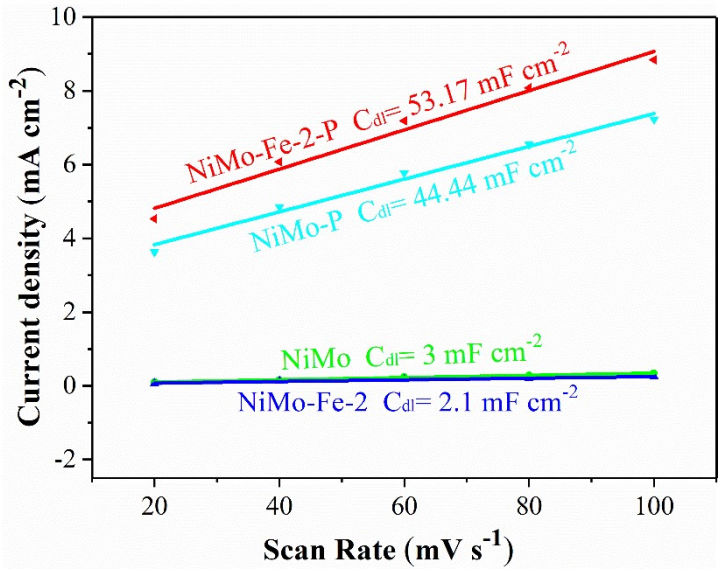

Fig. S10. C_{dl} comparison of different samples (HER).

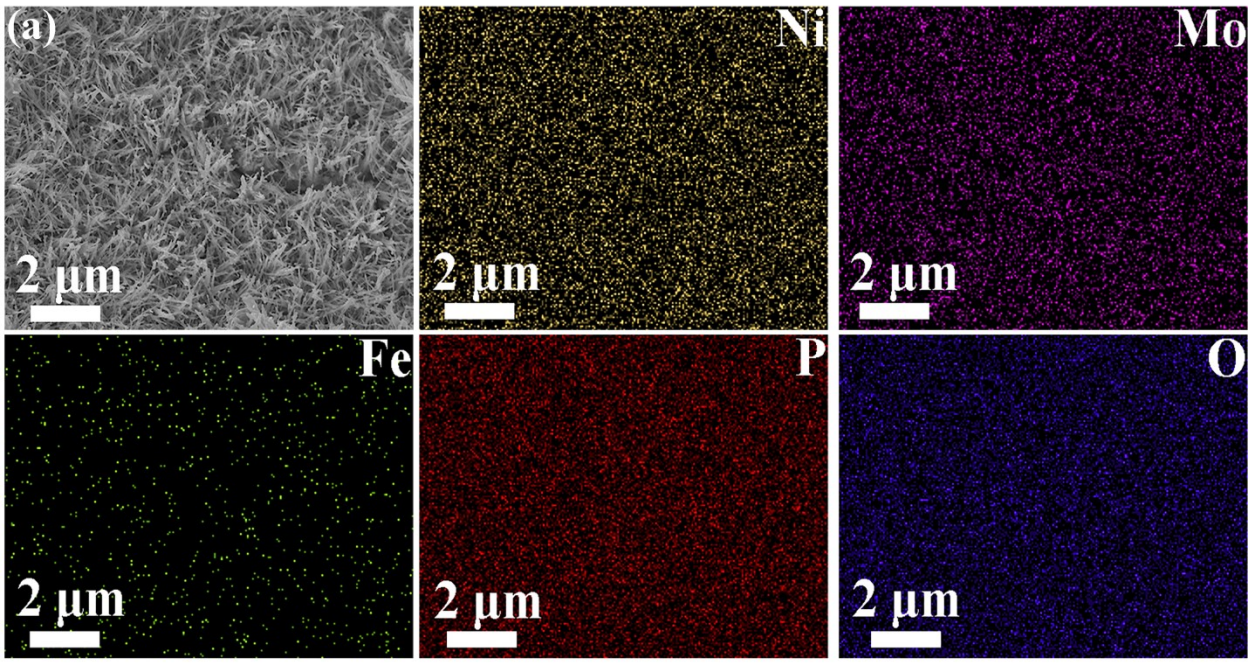

Fig. S11. Morphology and element distribution of NiMo-Fe-2-P.

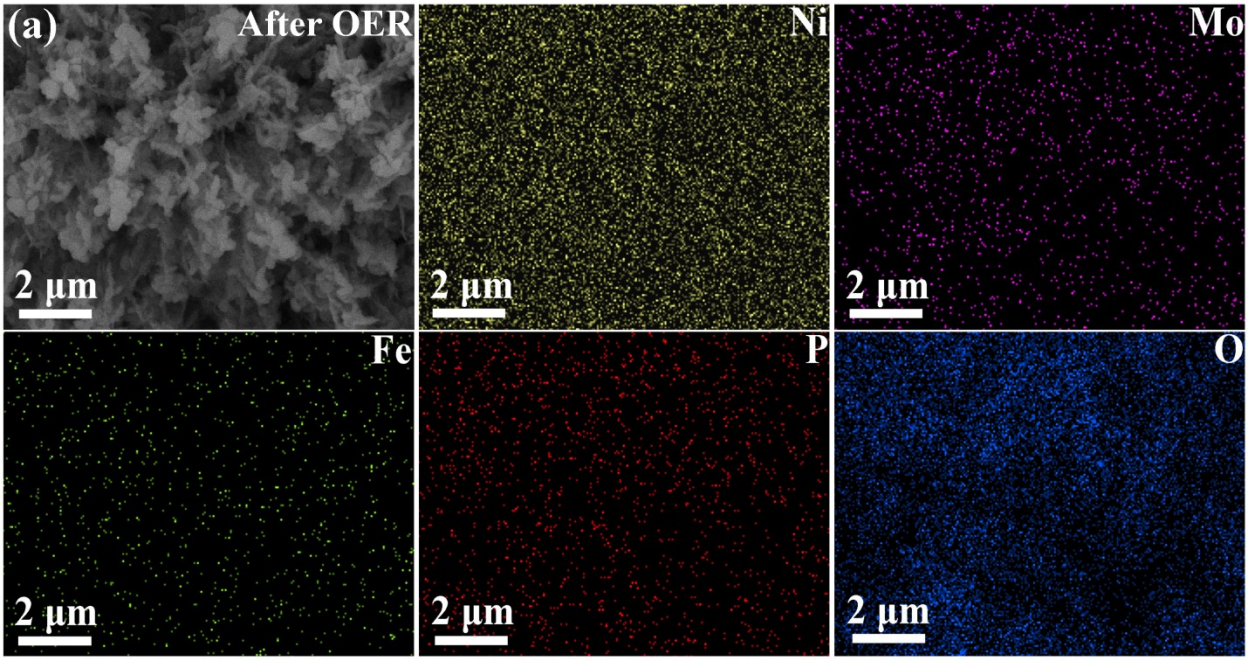

Fig. S12. Morphology and element distribution of NiMo-Fe-2-P after OER test.

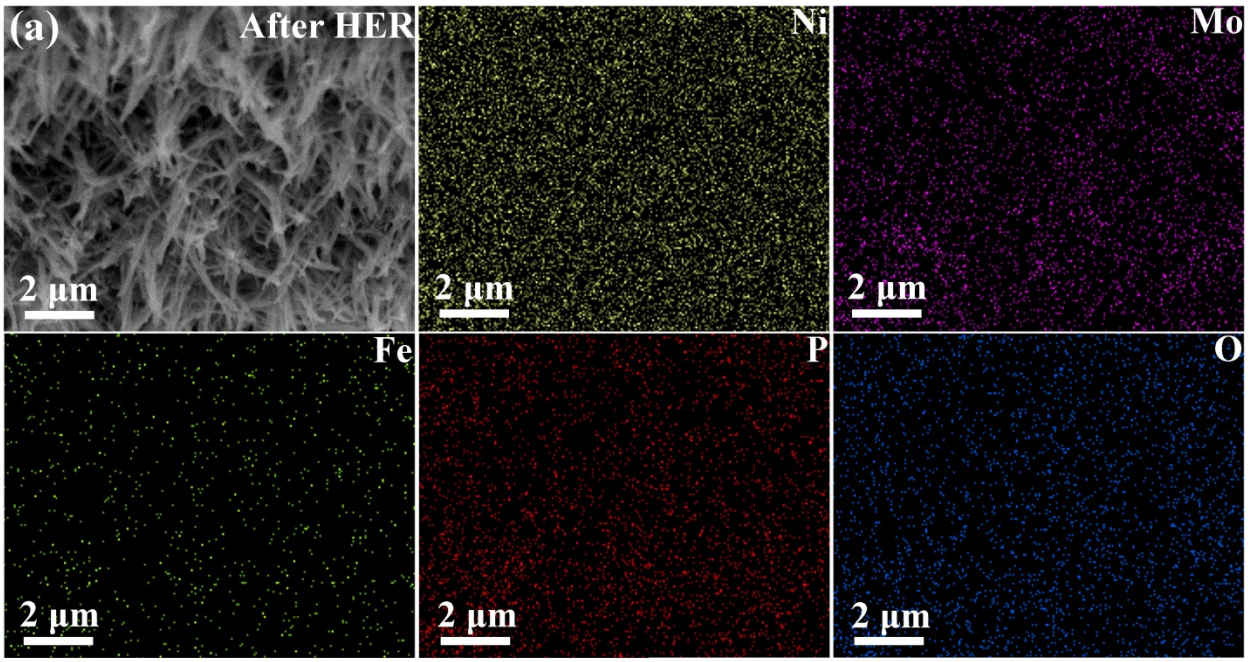

Fig. S13. Morphology and element distribution of NiMo-Fe-2-P after HER test.

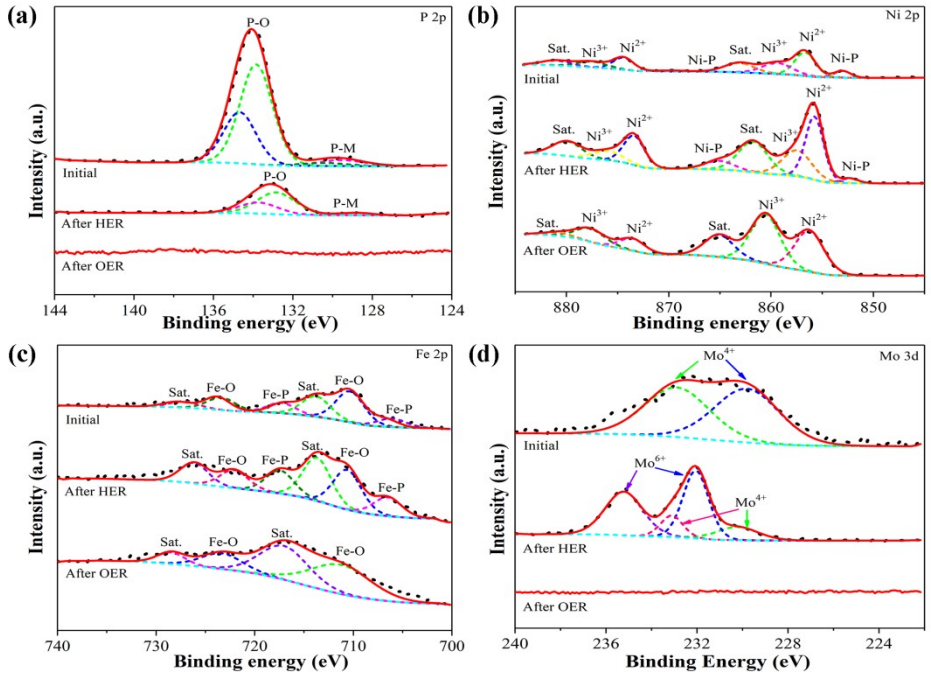

Fig. S14. XPS high-resolution spectrum before and after HER/OER of NiMo-Fe-2-P.

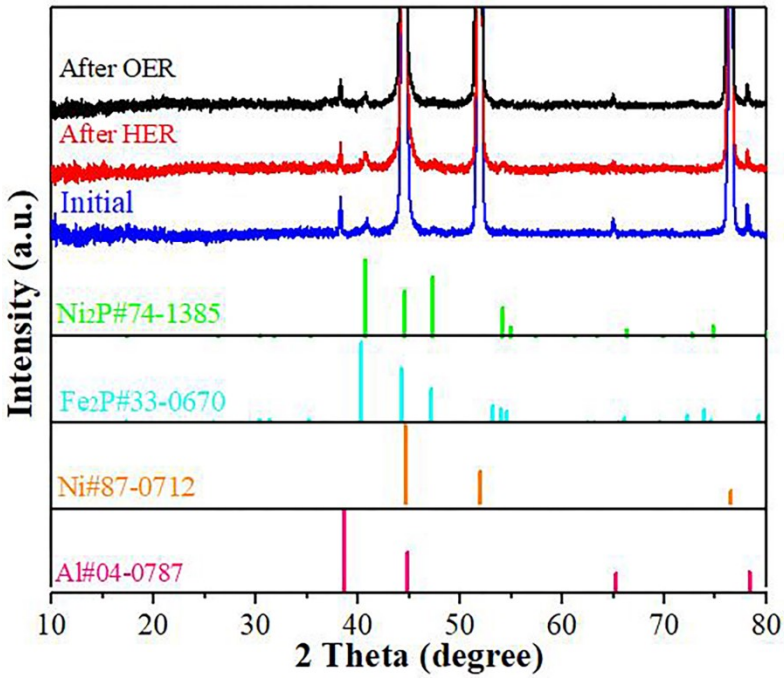

Fig. S15. XRD pattern before and after HER/OER of NiMo-Fe-2-P.

Table. S1. Summary of the loading amounts of the as-prepared samples on the NF.

Samples	Loading mass (mg cm^{-2})
NiMo	2.52
NiMo-P	3.48
NiMo-Fe-1	2.2
NiMo-Fe-2	2.18
NiMo-Fe-3	2.16
NiMo-Fe-1-P	3.45
NiMo-Fe-2-P	3.42
NiMo-Fe-3-P	3.4
Pt/C	3.42
IrO_2	3.42

Table. S2. Relative element content （at%）of as-prepared NiMo-Fe-2-P, after OER NiMo-Fe-2-P and after HER NiMo-Fe-2-P quantified by EDS.

	Ni	Mo	Fe	P	O
NiMo-Fe-2-P	34.6	8.8	1.5	16.4	38.7
After OER	33.7	0.5	0.4	1.6	63.8
After HER	35.2	6.7	1.2	10.1	46.9

Table. S3. Comparison of OER/HER/overall water splitting performance of NiMo-Fe-2-P with recently reported catalysts.

Material	Electrolyte (KOH)	HER η10 (mV)	OER η10 (mV)	Overall water splitting η10 (V)	Ref
NiMo-Fe-2-P	1.0 M	73.1	215.2	1.526	This work
CoSAs-MoS_2/TiN NRs	1.0 M	131.9	340.6	1.58	[1]
$Co(OH)_2$/NiMo CA@CC	1.0 M	30	267	1.52	[2]
NiFeOP	1.0 M	153	217	1.57	[3]
$VCoCO_x$@NF	1.0 M	63	240	1.54	[4]
CoMnP/Ni_2P/NF	1.0 M	108	209	1.54	[5]
Ni-Fe-P-Ni_3S_2/NF	1.0 M	69	219	1.5	[6]
NiCoZnP/NC	1.0 M	74	228	1.54	[7]
Co-Ni_3S_2	1.0 M	80	228	1.54	[8]
POM@ZnCoS/NF	1.0 M	170	200	1.56	[9]
NiCoFeMnCrP	1.0 M	220	270	1.55	[10]
Co/CoO@NC@CC	1.0 M	152	284	1.66	[11]
CuO@CoZn-LDH	1.0 M	124	194	1.55	[12]
Ni@CoO@CoMOFC	1.0 M	138	247	1.61	[13]
Cu_3P-Cu_2O/NPC	1.0 M	138	286	1.57	[14]
CoFe PBA@CoP	1.0 M	100	171	1.542	[15]

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