Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Strong electronic coupled $FeNi_3/Fe_2(MoO_4)_3$ nanohybrids for enhancing the electrocatalytic activity of oxygen evolution

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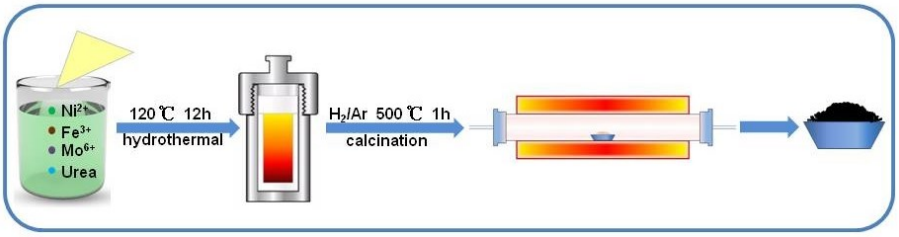
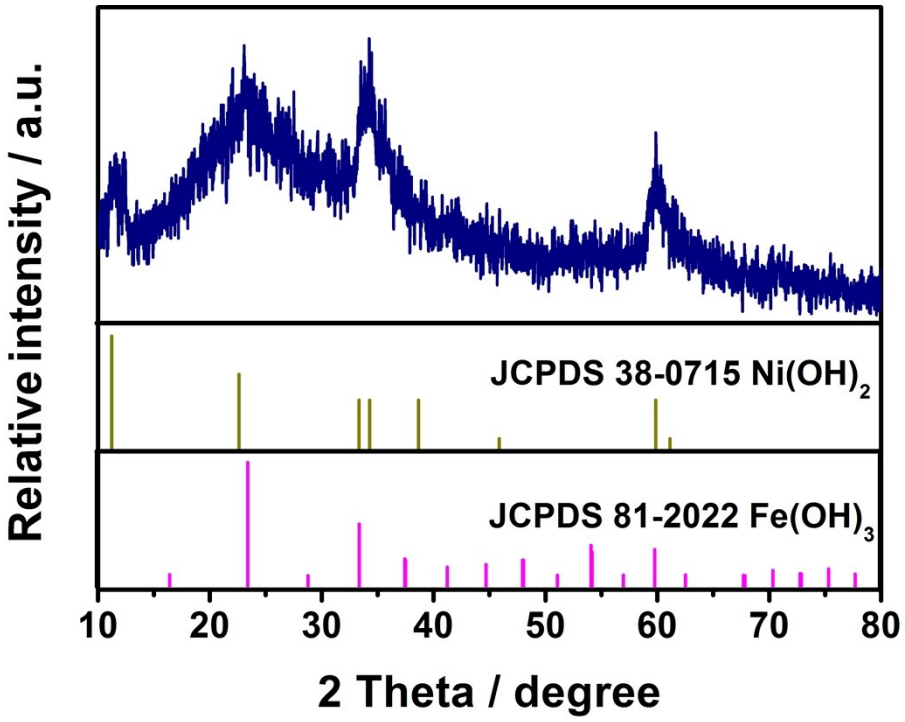
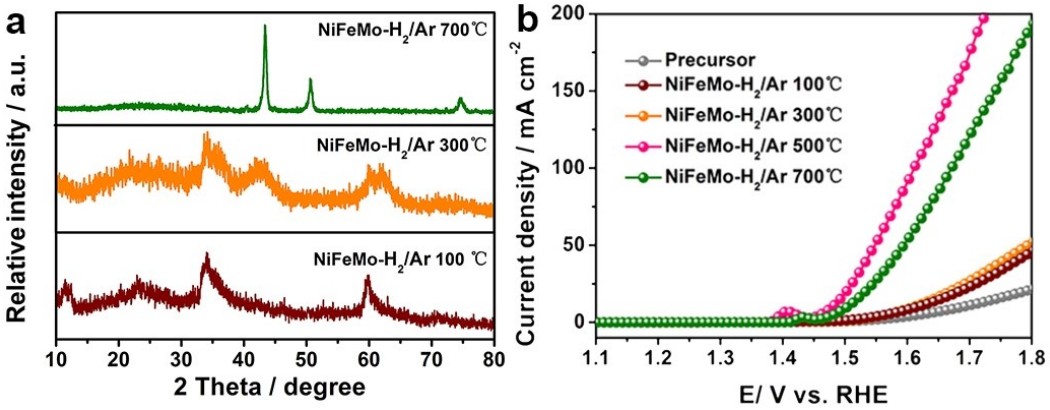


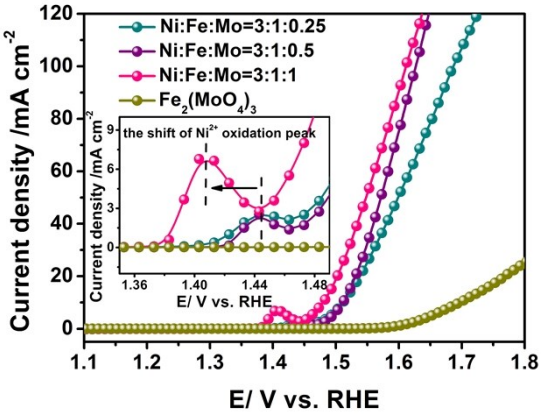
Supplementary Scheme. 1 Schematic illustration of the fabrication of $Fe_2(MoO_4)_3/FeNi_3$ hybrid.



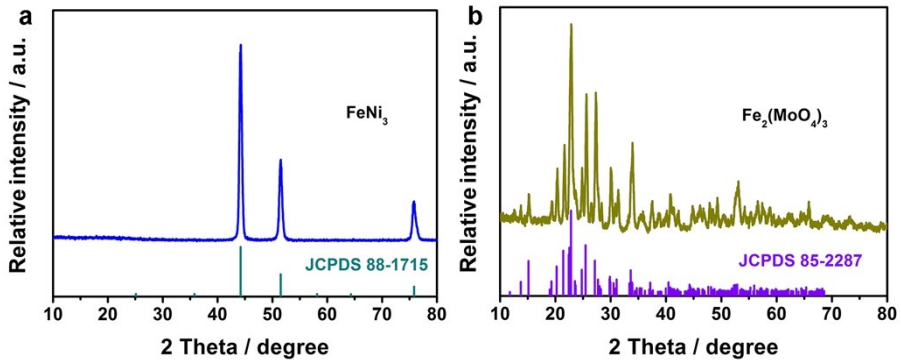
Supplementary Fig. 1 X-ray diffraction patterns of the NiFeMo precursor samples.



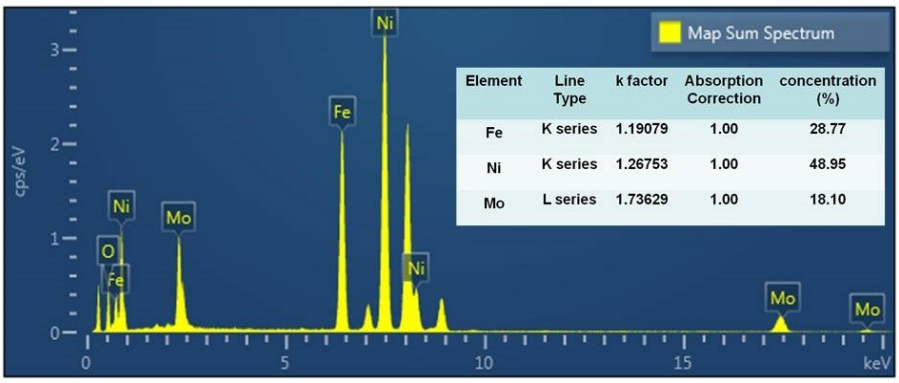
Supplementary Fig. 2 (a) Corresponding XRD patterns and (b) Polarization curves for OER of samples at different calcination temperatures.



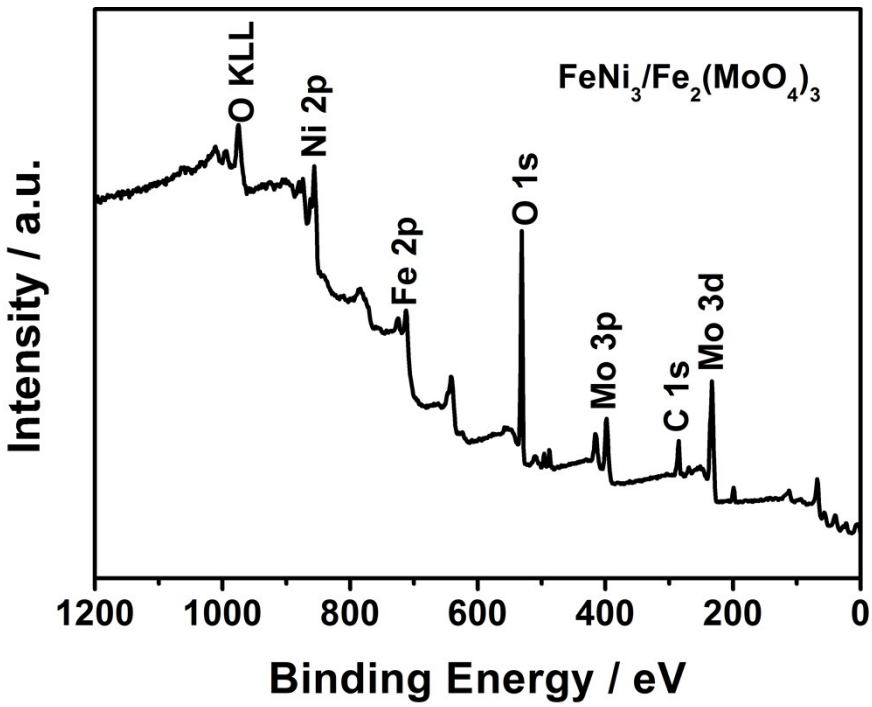
Supplementary Fig. 3 Polarization curves for OER of samples with different feed ratios.



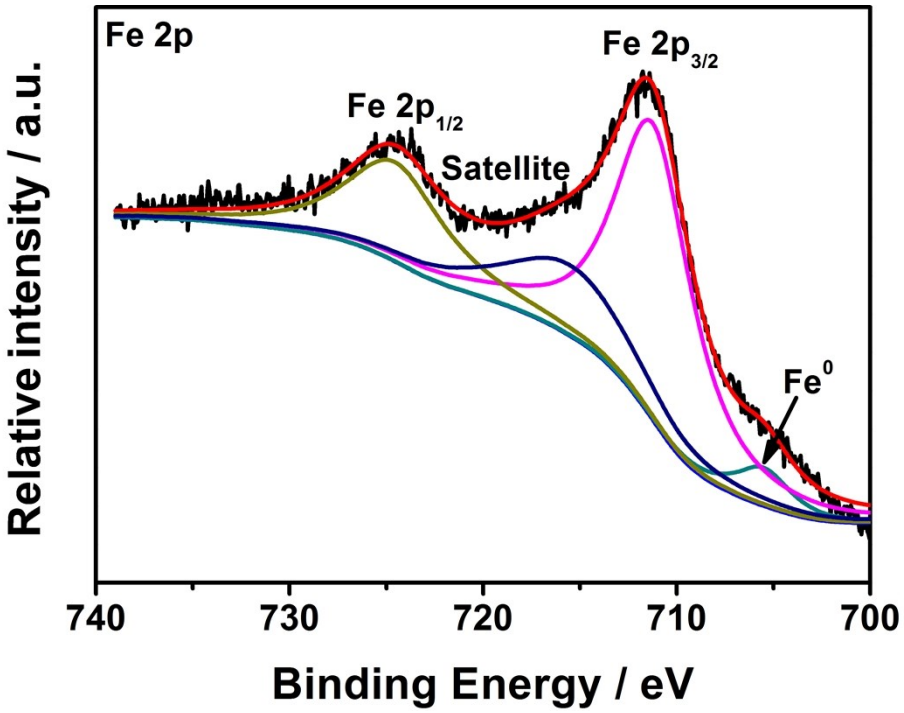
Supplementary Fig. 4 X-ray diffraction patterns of the $FeNi_3$ and $Fe_2(MoO_4)_3$ samples.



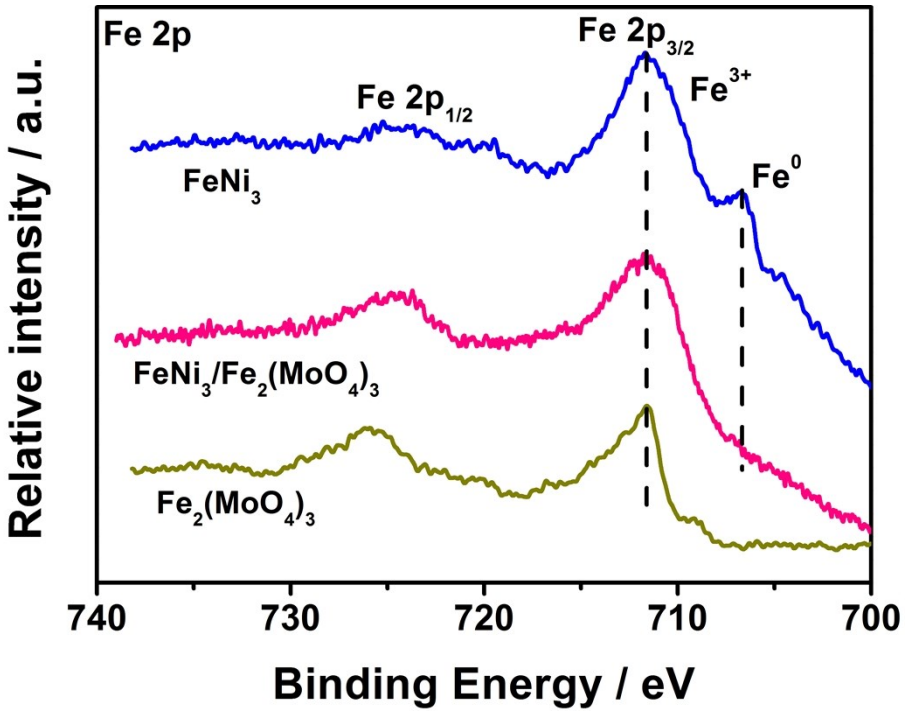
Supplementary Fig. 5 EDS spectrum of $Fe_2(MoO_4)_3/FeNi_3$ hybrid catalyst.



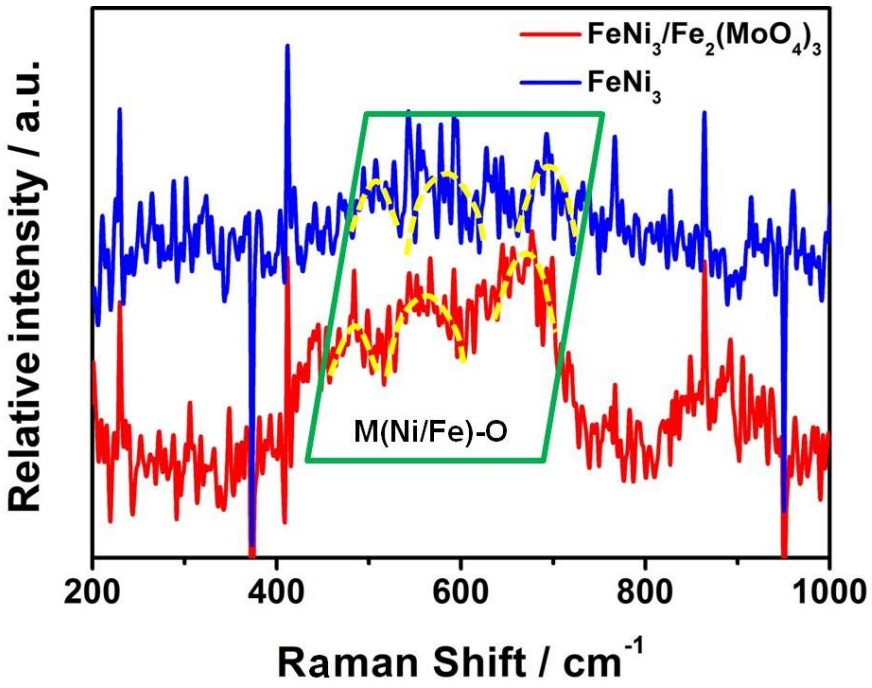
Supplementary Fig. 6 XPS survey spectrum of the $Fe_2(MoO_4)_3/FeNi_3$ hybrid.



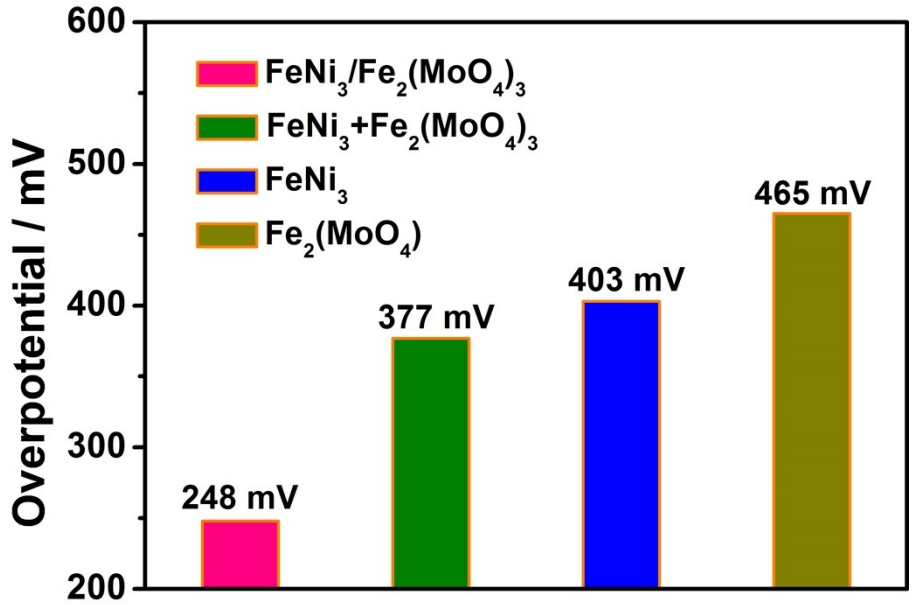
Supplementary Fig. 7 Fe 2p core-level spectra of $FeNi_3/Fe_2(MoO_4)_3$ hybrid.



Supplementary Fig. 8 Fe 2p core-level spectra of $FeNi_3$ and $Fe_2(MoO_4)_3$ and $FeNi_3/Fe_2(MoO_4)_3$ hybrid.



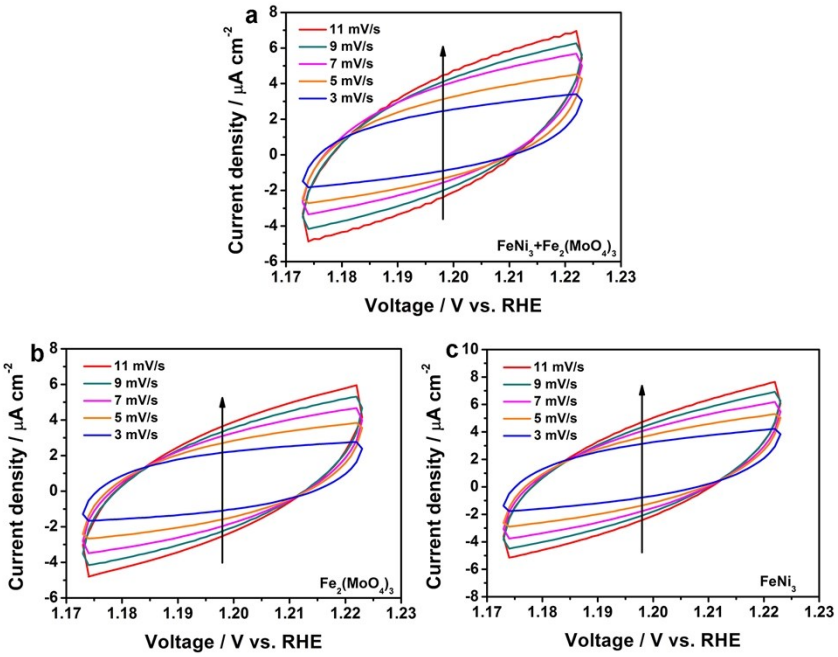
Supplementary Fig. 9 Raman spectra of $FeNi_3$ and $FeNi_3/Fe_2(MoO_4)_3$ hybrid.



Supplementary Fig. 10 Comparison of the OER overpotential at 10 mA cm^{-2} with a series of catalysts.

Supplementary Table 1 Electrocatalysis results of as-prepared $Fe_2(MoO_4)_3/FeNi_3$ hybrid comparing with some state of the art catalytic electrodes.

Catalysts	Electrolyte	Overpotential at 10 $mA.cm^{-2}$	Reference
$FeNi_3/Fe_2(MoO_4)_3$ hybrid	1 M KOH	248 mV	This work
CoFe LDH-Ar	1 M KOH	350 mV	[1]
$FeNi_3N$	1 M KOH	310 mV	[2]
Fe-CoOOH/G	1 M KOH	330 mV	[3]
$NiCoO_x$	1 M KOH	336 mV	[4]
Fe_2P/Fe_4N@N-C	1 M KOH	410 mV	[5]
$FeNi_3$@NC	1 M KOH	277 mV	[6]
$FeNi_3$-Fe_3O_4 NPs/MOF-CNT	1 M KOH	234 mV	[7]
$FeNi_3$-modified $Fe_2O_3/NiO/MoO_2$	1 M KOH	282 mV	[8]
$FeNi_3N/FeNi_3$	1 M KOH	254 mV	[9]
FeNiF/NCF	1 M KOH	260 mV	[10]

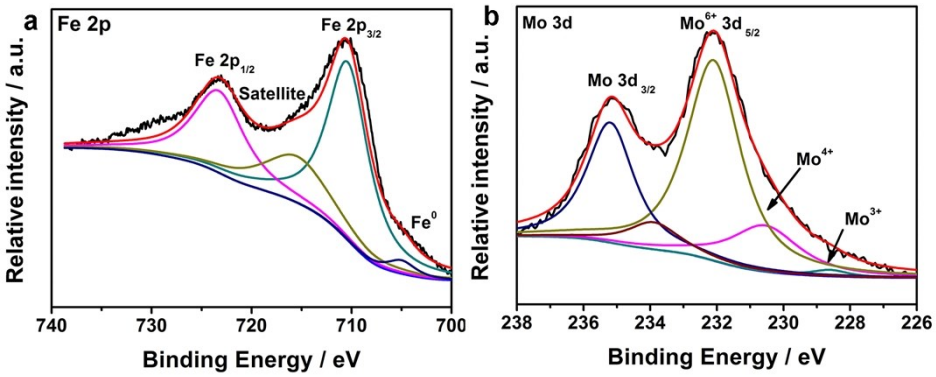


Supplementary Fig. 11 CV curves of a) $Fe_2(MoO_4)_3$+$FeNi_3$, b) $Fe_2(MoO_4)_3$, c) $FeNi_3$ at different scan rates from 3 to 11 mV/s between 1.17 V and 1.23 V vs. RHE in 1.0 M KOH.

Supplementary Table 2 Impedance fitting results of as-prepared $Fe_2(MoO_4)_3$/$FeNi_3$ hybrid samples comparing with different catalytic electrodes.

Samples	R_s / Ω	C_{dl} / F	R_{ct} / Ω
$Fe_2(MoO_4)_3$	8.402	2.914 e^{-6}	415.5
$FeNi_3$	8.866	3.692 e^{-6}	192.58
$Fe_2(MoO_4)_3$/$FeNi_3$	7.069	3.923 e^{-6}	9.53
$Fe_2(MoO_4)_3$+$FeNi_3$	8.923	1.101 e^{-5}	108

Notes: R_s value is used to describe the resistance of solution; C_{dl} values are the double-layer capacitance; R_{ct} represents the resistances of charge transfer.



Supplementary Fig. 12 High-resolution XPS spectra for Fe 2p and Mo 3d region of the $Fe_2(MoO_4)_3/FeNi_3$ hybrid after OER.

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