Supporting Information

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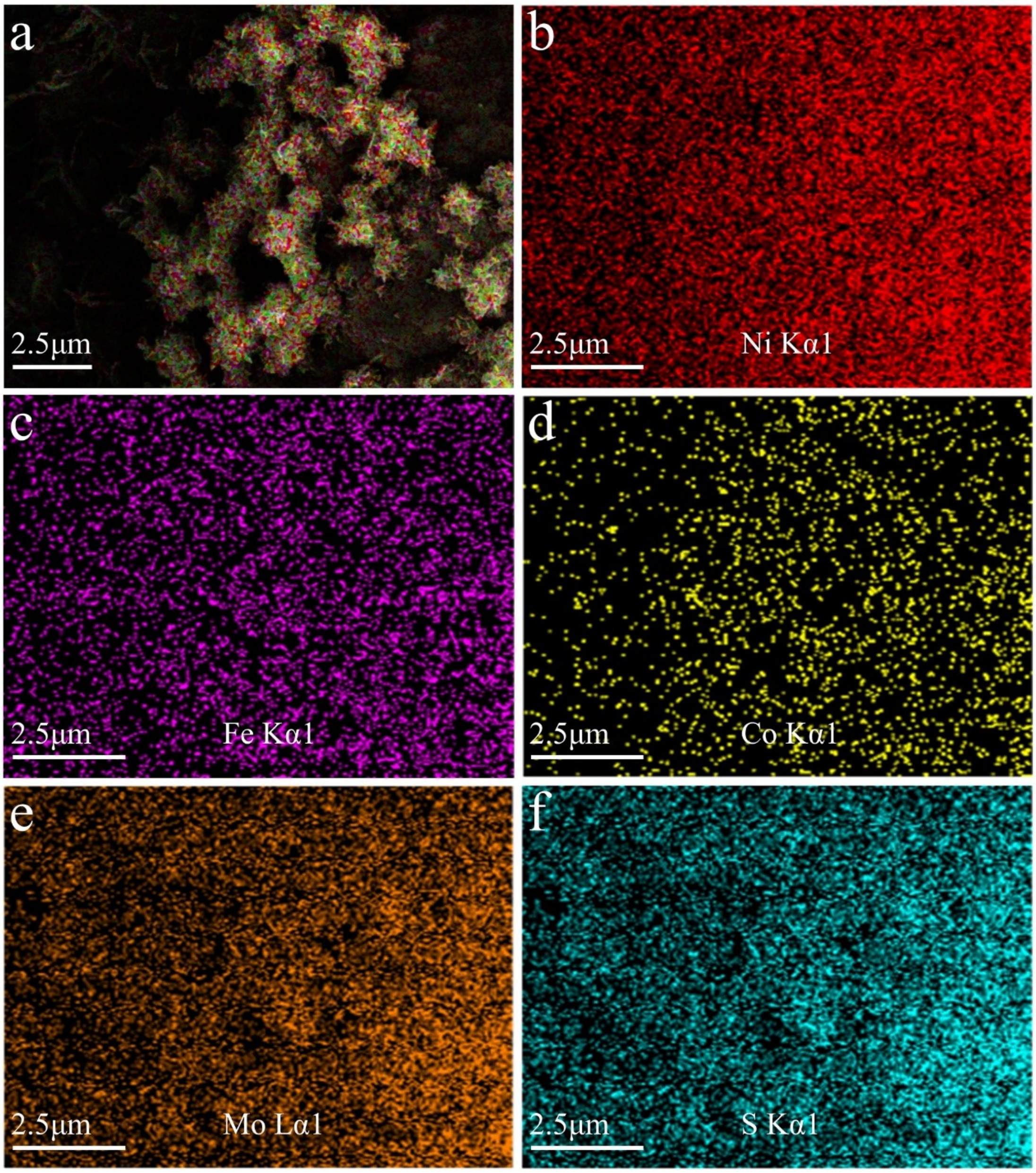

Figure 1 EDS mapping image of NiFeCoMoS/NFF

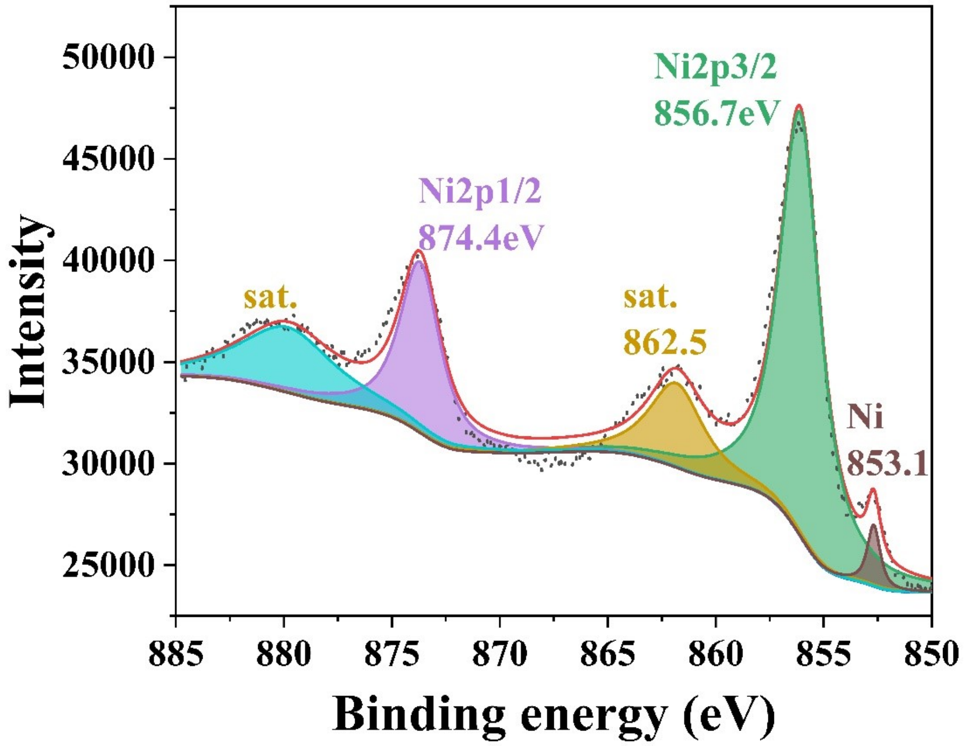

Figure 2 High-resolution XPS spectra for Ni 2p of Ni_3S_2

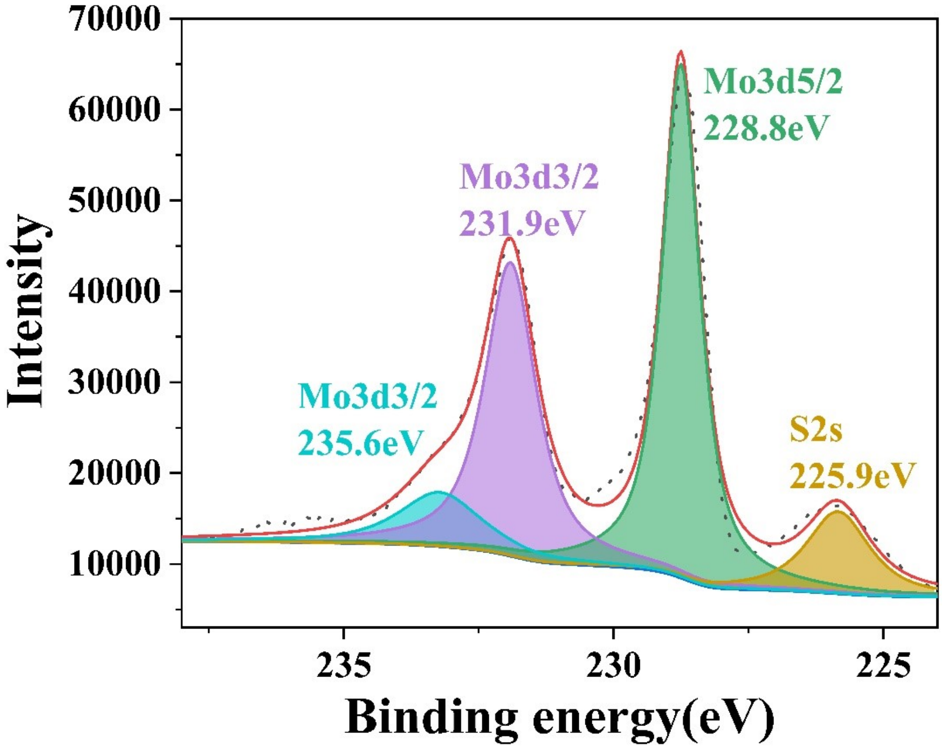

Figure 3 High-resolution XPS spectra for Mo 2p of MoS_2

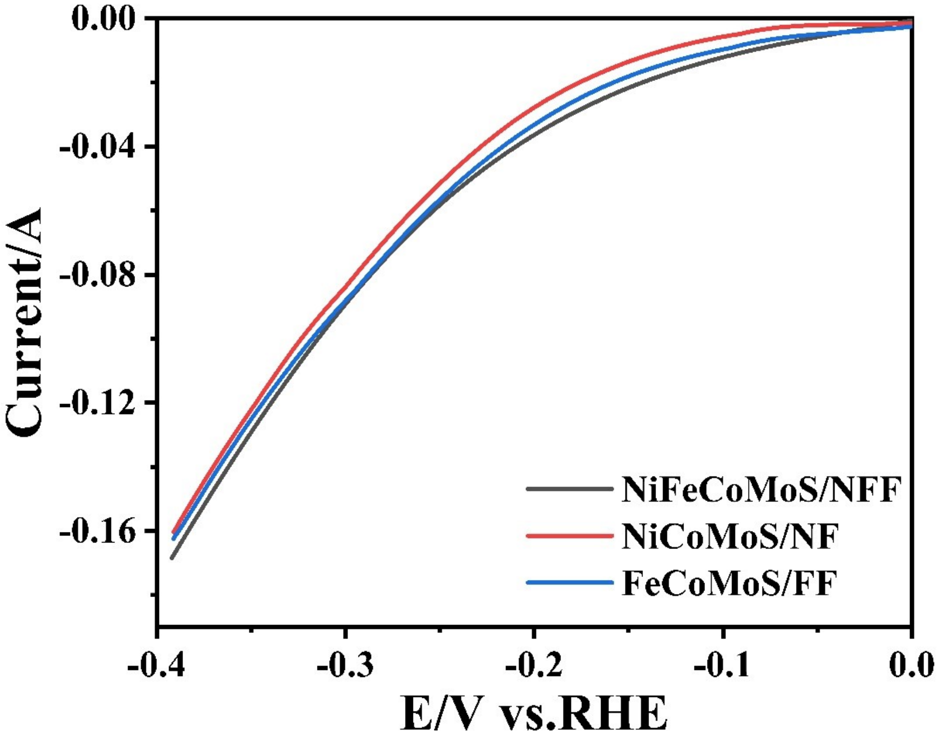

Figure 4 Polarization curves of HER

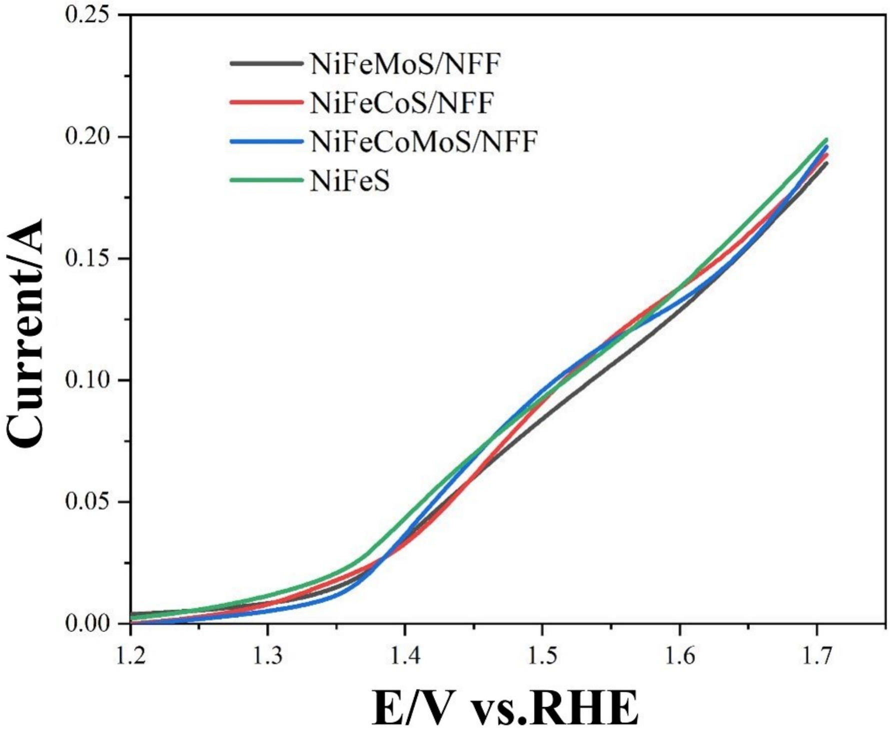

Figure 5 Polarization curves of OER

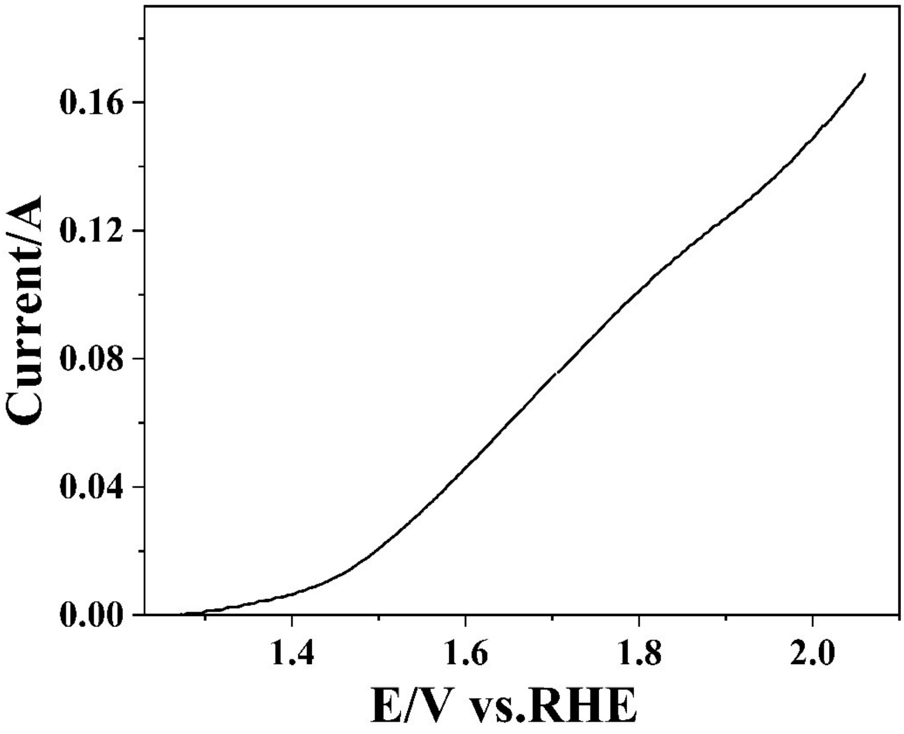

Figure 6 Polarization curve of two-electrode system

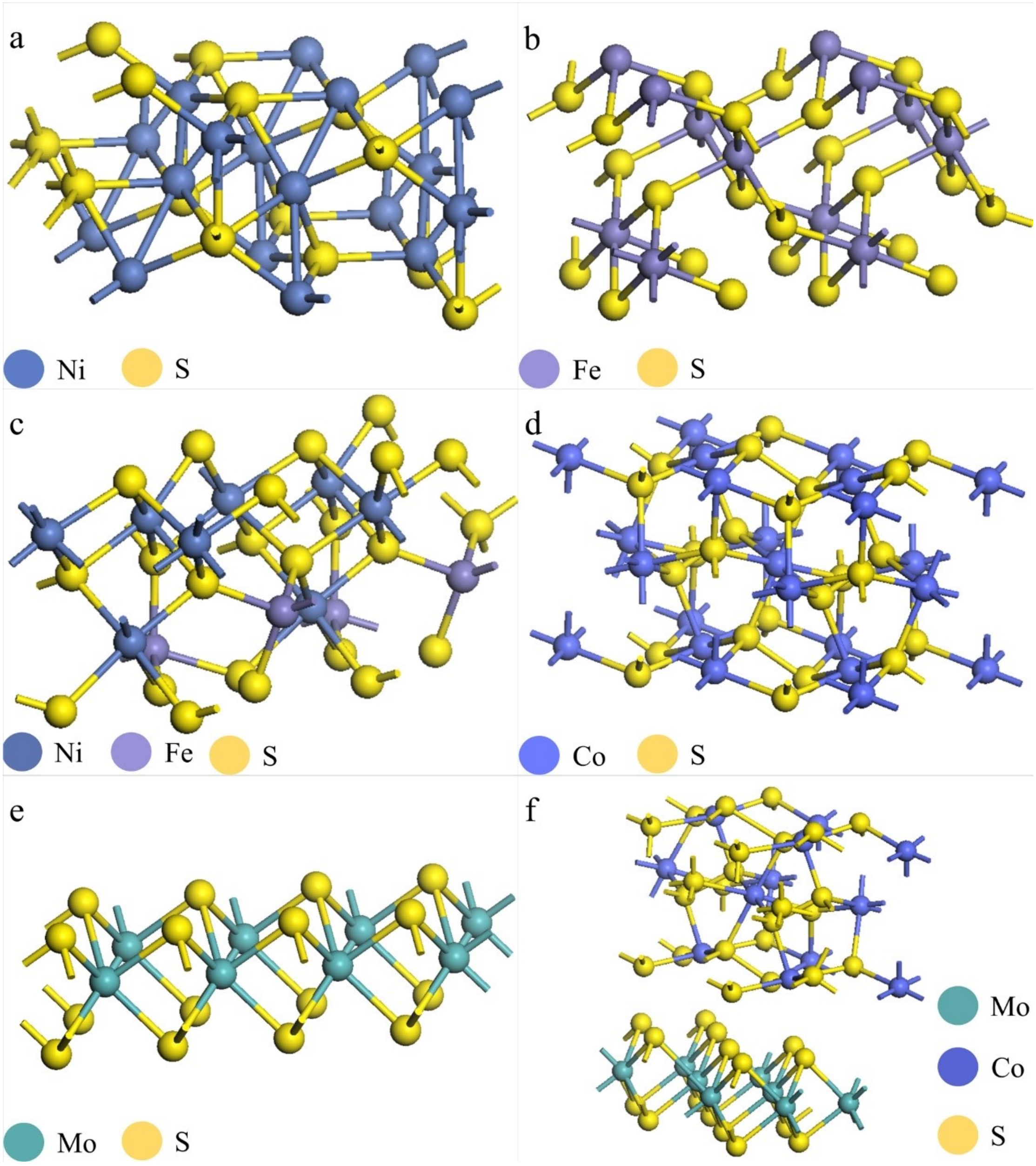

Figure 7 Chemisorption models of Ni_3S_2[1 0 1] (a), FeS_2[200] (b), Fe $(NiS_2)_2$ [1 1 1] (c), CoS_2 [2 0 0], MoS_2 and CoMoS.

Table1 Cdl and ECSA of HER

Catalysts	Cdl(mF.cm^{-2})	ECSA (cm^2)
CoMoS/FF	33.3	832.5
CoMoS/NF	29.9	747.5
NiFeCoMoS/NFF	32.2	805
NiFeMoS/NFF	12.4	310
NiFeCoS/NFF	15.3	382.5
NiFeS	21.2	530

Table2 Cdl and ECSA of OER

Catalysts	Cdl(mF.cm^{-2})	ECSA (cm^2)
CoMoS/FF	7.5	187.5
CoMoS/NF	21.3	532.5
NiFeCoMoS/NFF	31.9	797.5
NiFeMoS/NFF	30.6	765
NiFeCoS/NFF	32.5	812.5
NiFeS	32.7	817.5

Table3 Comparison of activity of the NiFeCoMoS/NFF with recently reported non-precious metal based electrocatalysts. The * indicates data was corrected by the iR loss.

Electrocatalyst	Electrolyte	η_{10} / mV	Substrate	Reference
Ni3S2-CoMoSx	1M KOH	1.52*	Ni foam	1
Co-Fe-NiSe2	1M KOH	1.52*	carbon cloth	2
MoS2/NiS2	1M KOH	1.59*	carbon cloth	3
MoS2/NiS	1M KOH	1.61	Ni foam	4
P- Co3O4	1M KOH	1.63	Ni foam	5
Ni/Mo2C-NCNF	1M KOH	1.64	carbon cloth	6
Fe-Ni@NC-CNTs	1M KOH	1.7	carbon cloth	7
NiCo/NiCoOx	1M KOH	1.72	Ni foam	8
δ-FeOOH	1M KOH	1.65	Ni foam	9
NiCo2S4	1M KOH	1.7	Ni foam	10

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