

Supporting Information

Spherical V-doped Nickel-iron LDH Decorated on Ni₃S₂ as High-efficiency Electrocatalyst for Oxygen Evolution Reaction

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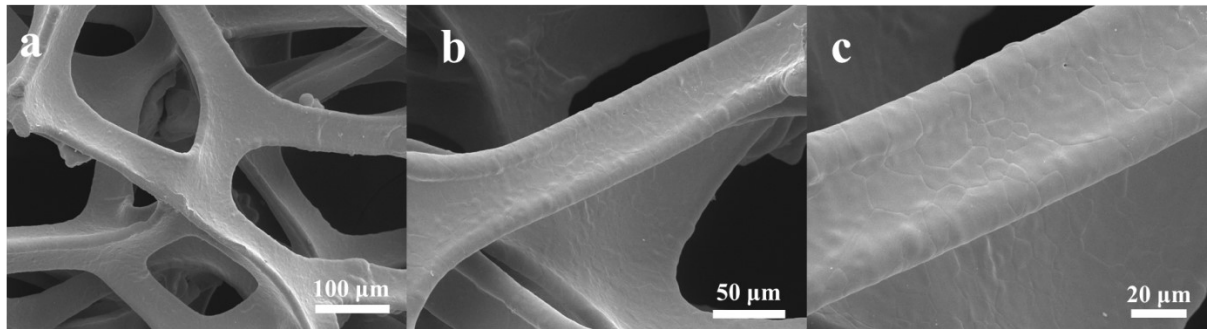


Fig. S1. SEM images of commercial Ni foam at low and high magnifications.

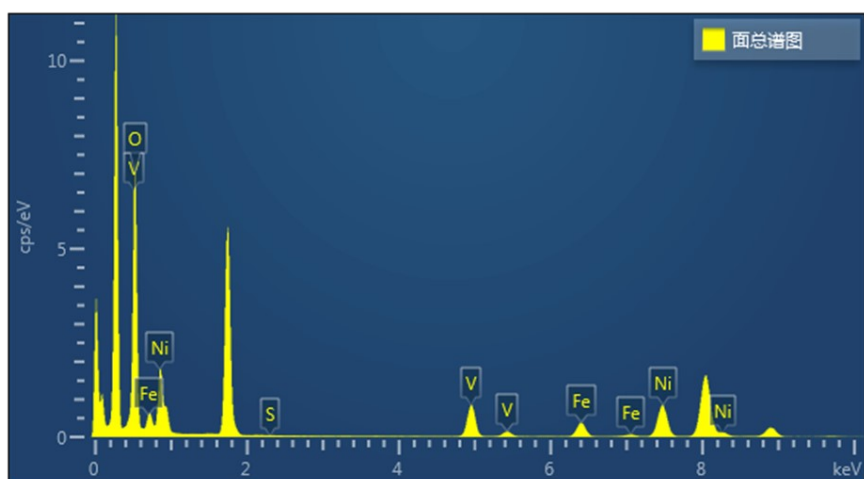


Fig. S2. Element composition diagram corresponding to EDX spectrum

Table S1 Elemental composition of V, Fe, Ni and S determined by EDX spectrum

Element	V	Fe	Ni	S	O
Atom%	5.85	2.75	6.35	0.02	85.03

Table S2 XPS quantization ratio of three valence states V

Name	V ³⁺	V ⁴⁺	V ⁵⁺
%content	26.93	49.96	23.11

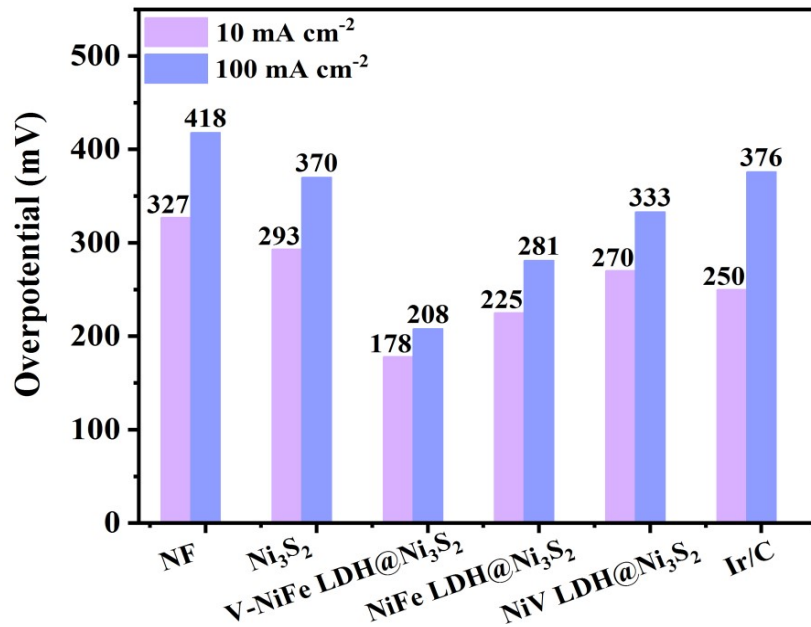


Fig. S3. comparison of overpotential required at 10 mA cm⁻² and 100 mA cm⁻²

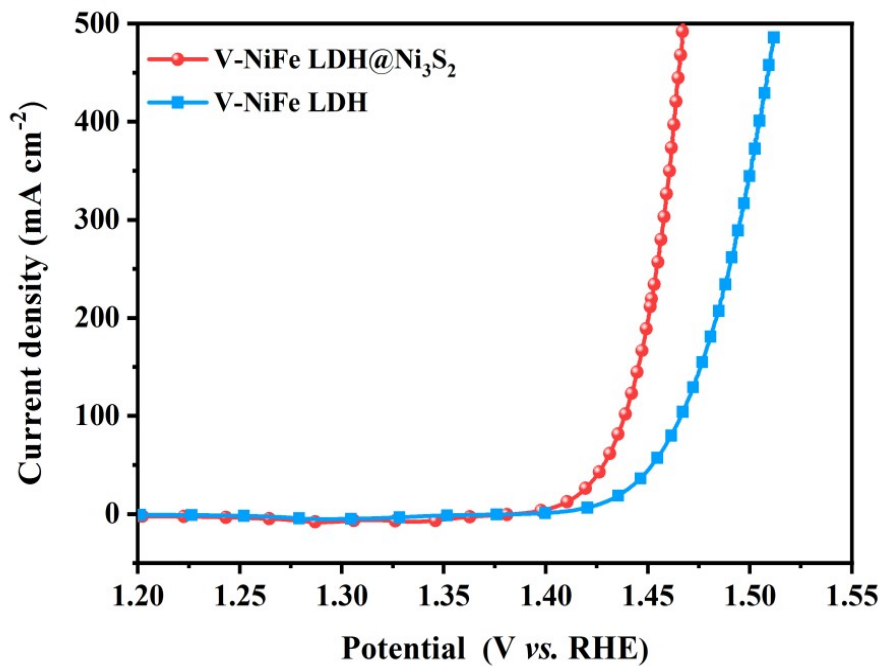


Fig. S4. OER polarization curves of V-NiFe LDH@Ni₃S₂ and V-NiFe LDH.

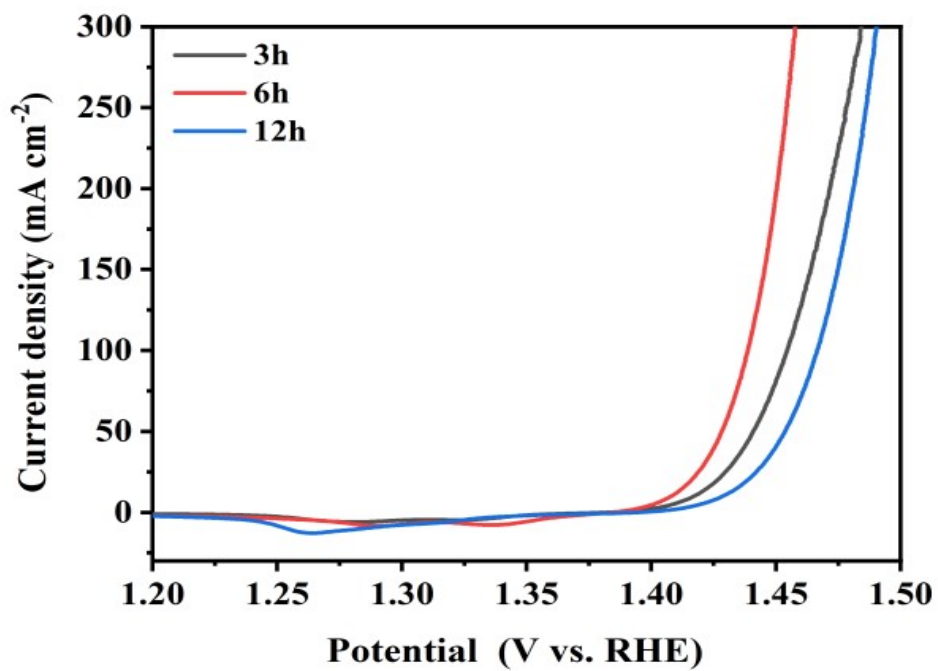


Fig. S5. OER polarization curves of V-NiFe LDH@Ni₃S₂-3h, V-NiFe LDH@Ni₃S₂-6h, and V-NiFe LDH@Ni₃S₂-12h.

Table S3. Comparison of the OER performance for the V-NiFe LDH@Ni₃S₂ catalyst

Electrocatalysts	Overpotential (mV) at 10 mA cm ⁻²	Tafel slope (mV dec ⁻¹)	Electrolyte	Reference
V-NiFe-LDH@Ni ₃ S ₂	178	27.31	1M KOH	This work
NiFe LDH/NF	219	33	1M KOH	J. Mater. Chem. A, 2019, 7, 22889.
Pt-NiFe LDH	195	31.3	1M KOH	Nano Energy 2017, 39, 30-43.
Ni ₅ P ₄ /Ni ₅ P ₂ /NiFe LDH	197	46.6	1M KOH	J. Mater. Chem. A. 2018, 6, 13619-13623.
Cu@NiFe LDH	199	27.8	1M KOH	Energy Environ. Sci. 2017, 10, 1820-1827.
NiFe LDH/(NiFe)S _x	210	105	1M KOH	Electrochim. Acta, 2020, 348, 136339.
NiFe-LDH@NiCoP/NF	220	48.6	1M KOH	Adv. Funct. Mater. 2018, 28, 1706847.
NiFeRu LDH/NF	225	32.4	1M KOH	Adv. Mater. 2018, 30, 1706279.
Cu@CoFe LDH	240	44.4	1M KOH	Nano Energy 2017, 41, 327-336.
CoSe/NiFe LDH	250	57	1M KOH	Energy Environ. Sci. 2016, 9,478-483.
NiO@NiFe-LDH	256	72	1M KOH	ACS Sustainable Chem. Eng. 2019, 7, 2327.
NiCo/NiCoOx @FeOOH	278	47.5	1M KOH	Electrochim. Acta 2017, 257, 1-8.
Ni ₂ P/Ni ₃ S ₂ /NF	210	62	1M KOH	Nano Energy 2018, 51, 26-36.
MoxW _{1-x} S ₂ @Ni ₃ S ₂ /NF	285	90	1M KOH	ACS Appl. Mater. Interfaces 2017, 9, 26066-26076.

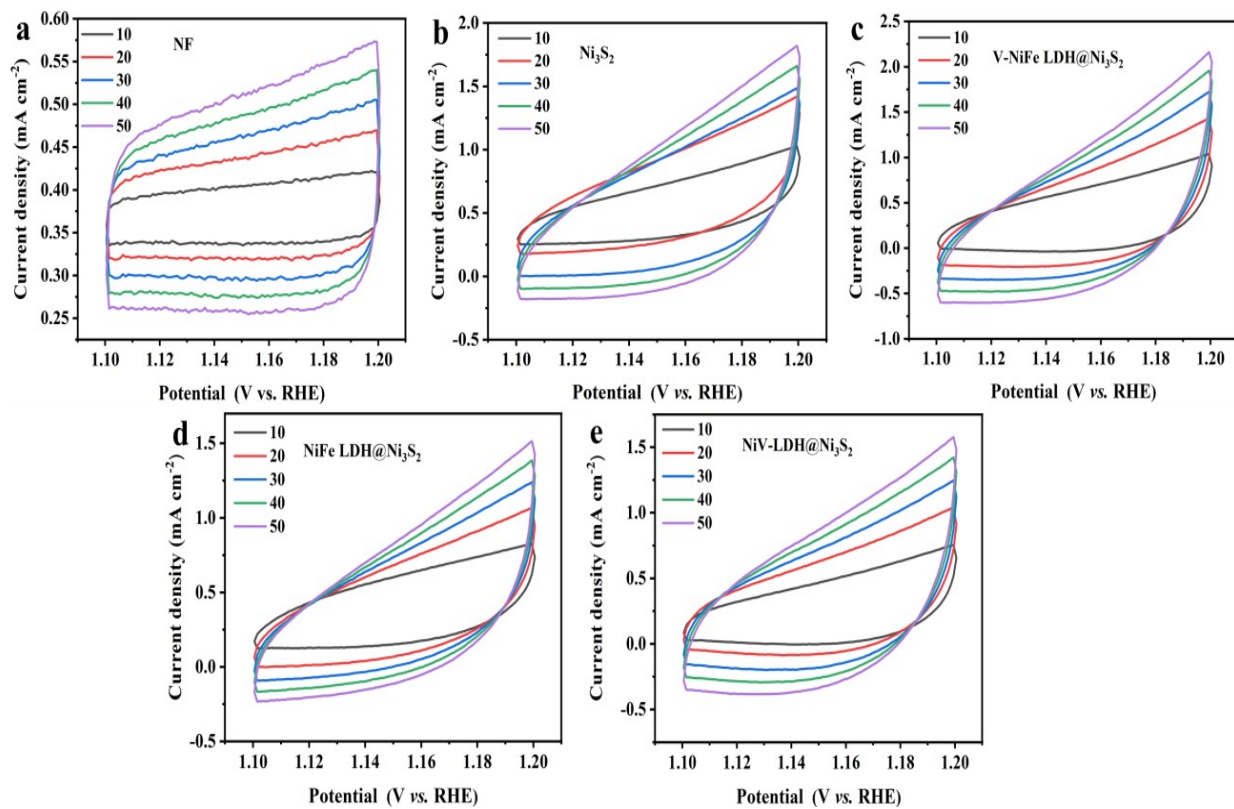


Fig. S6. Cyclic voltammograms at different scan rates (from 10 mV/s to 50 mV/s with an interval rate of 10 mV/s). (a) NF, (a) Ni₃S₂ (b) V-NiFe LDH@Ni₃S₂, and (c) NiFe-LDH@Ni₃S₂, and (d) NiV-LDH@Ni₃S₂.

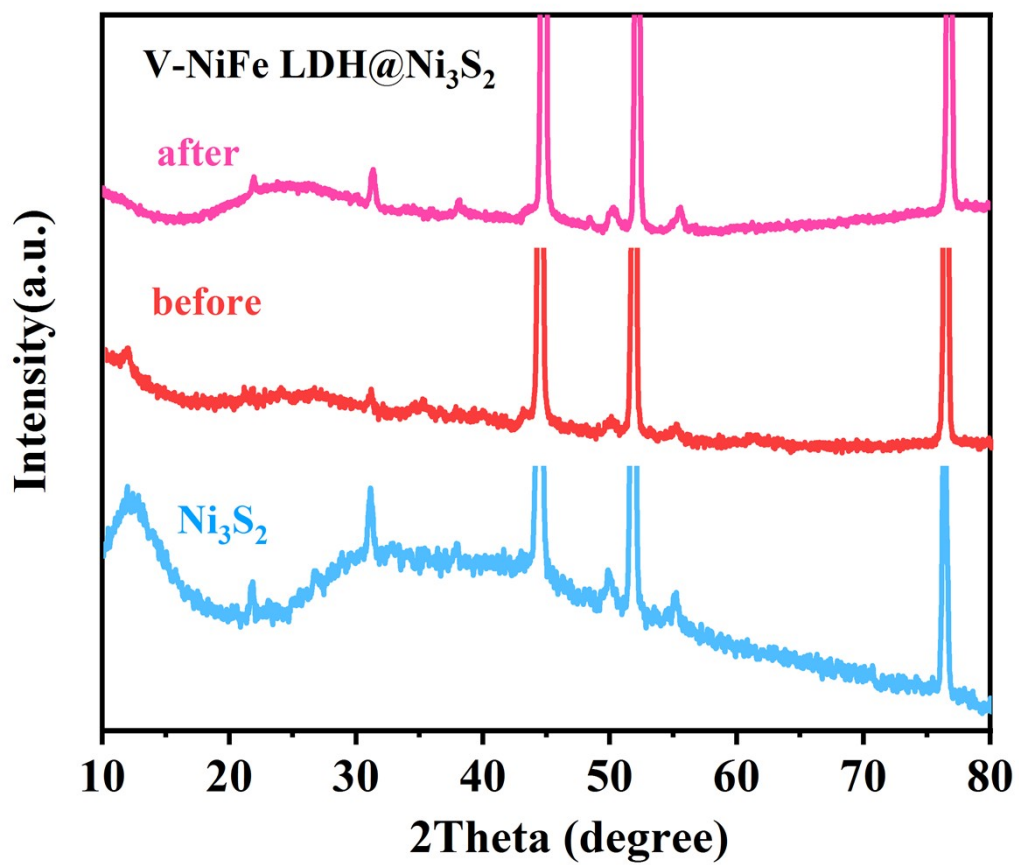


Fig. S7. XRD patterns

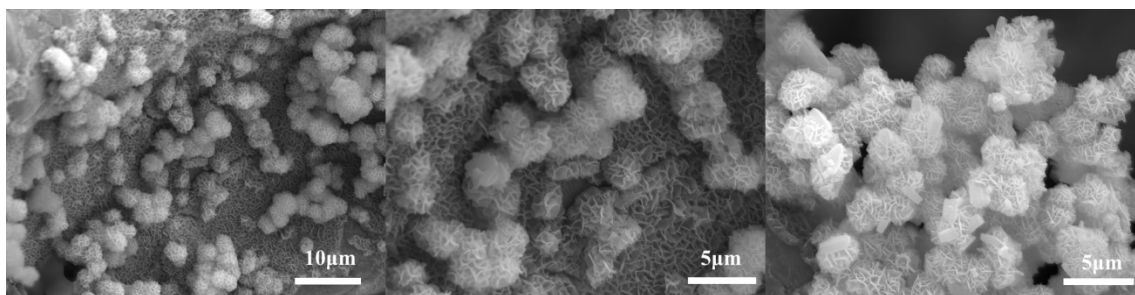


Fig. S8. SEM images of V-NiFe LDH@Ni₃S₂ (anode for OER) after 20 hours OER stability measurements with other reported OER electrocatalysts.