Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting information

Hydrangea-like nanosheets of $Co(OH)_2$@NiFe-LDH/NF as efficient electrocatalyst for oxygen evolution reactions

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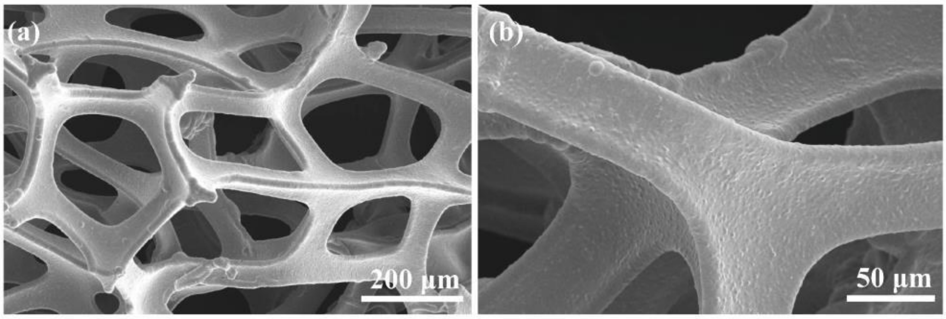

Fig. S1 (a, b) SEM images of bare NF skeleton at low and high magnification.

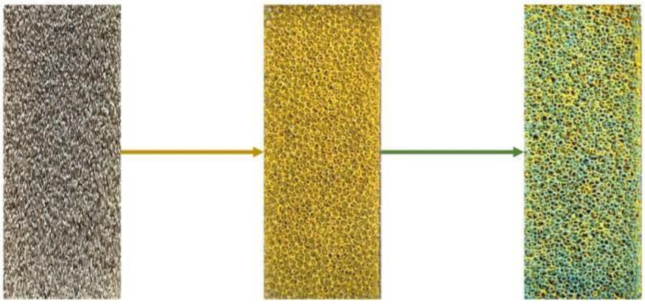

Fig. S2 The photos of bare NF, NiFe-LDH/NF and $Co(OH)_2$@NiFe-LDH/NF.

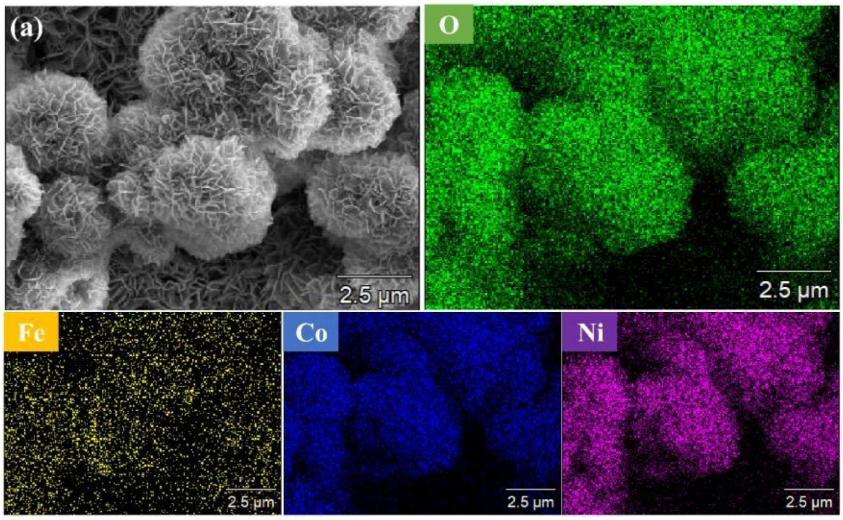

Fig. S3 EDS mapping images of the of $Co(OH)_2$@NiFe-LDH/NF.

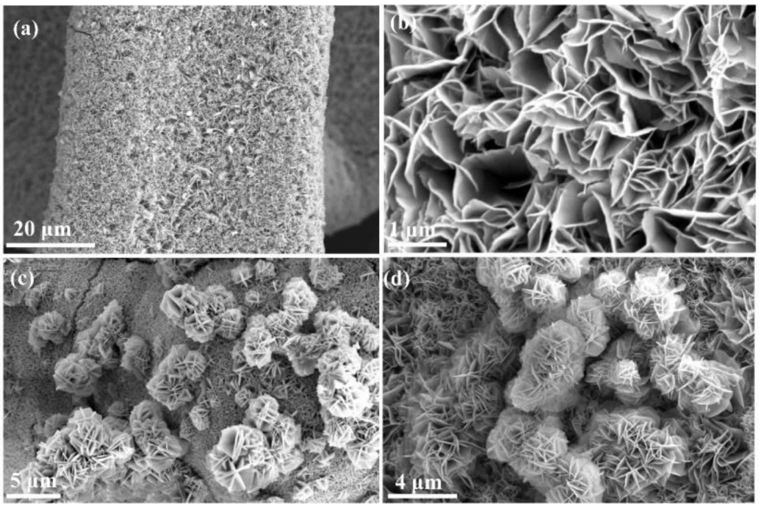

Fig. S4 SEM images of (a, b) $Co(OH)_2$/NF at low and high magnification, (c) NiFe-LDH/NF and (d) $Co(OH)_2$@NiFe-LDH/NF.

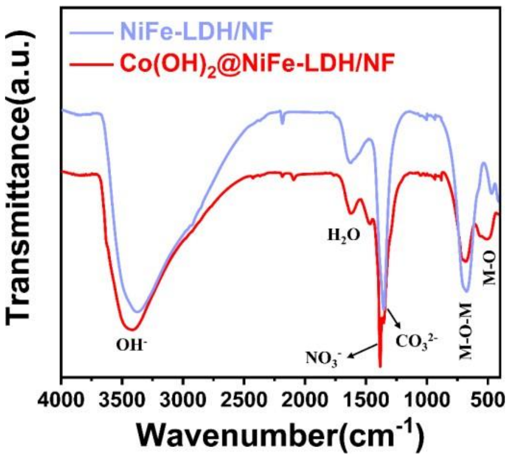

Fig. S5 FT-IR spectra of NiFe-LDH/NF and $Co(OH)_2$@NiFe-LDH/NF.

Table. S1 The simulated series resistance (R_s) and charge transfer resistance (R_{ct}) values based on the fitting models.

Samples	R_s (Ω)	R_{ct} (Ω)
bare NF	1.293	76.57
$Co(OH)_2$/NF	1.367	11.13
NiFe-LDH/NF	1.413	1.08
$Co(OH)_2$@NiFe-LDH /NF	1.325	0.63

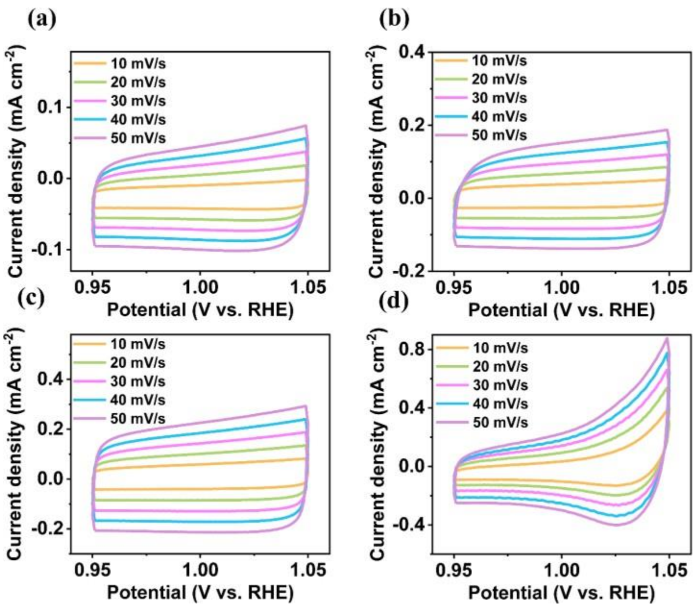

Fig. S6 Cyclic voltammograms of (a) bare NF, (b) $Co(OH)_2$/NF, (c) NiFe-LDH/NF and (d) $Co(OH)_2$@NiFe-LDH/NF with different scan rates.

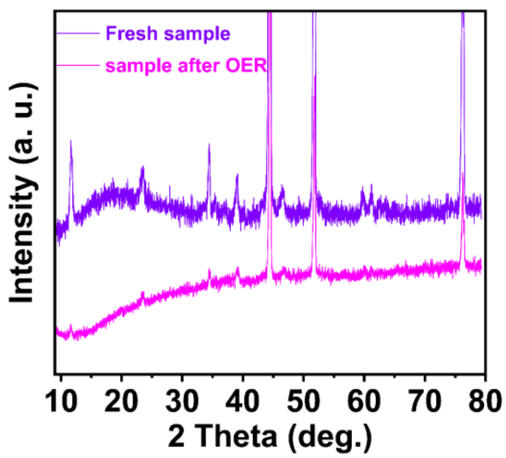

Fig. S7 XRD patterns of $Co(OH)_2$@NiFe-LDH/NF before and after OER testing.

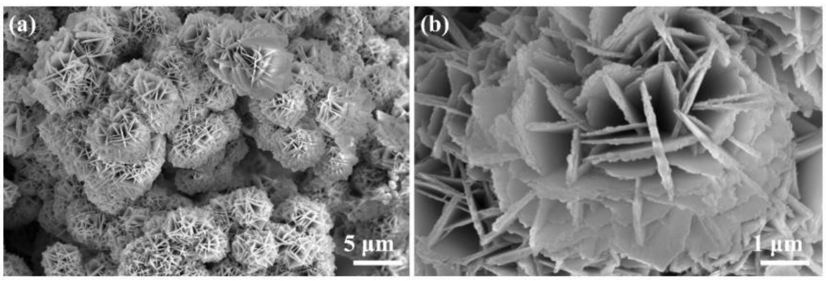

Fig. S8 SEM images of after OER testing.

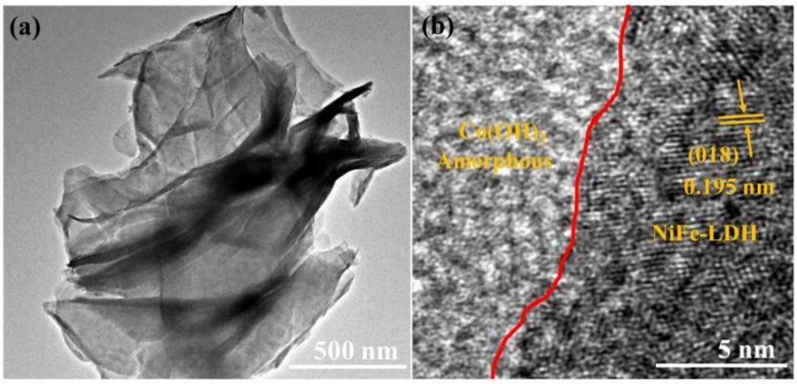

Fig. S9 TEM images of $Co(OH)_2$@NiFe-LDH/NF after OER testing.

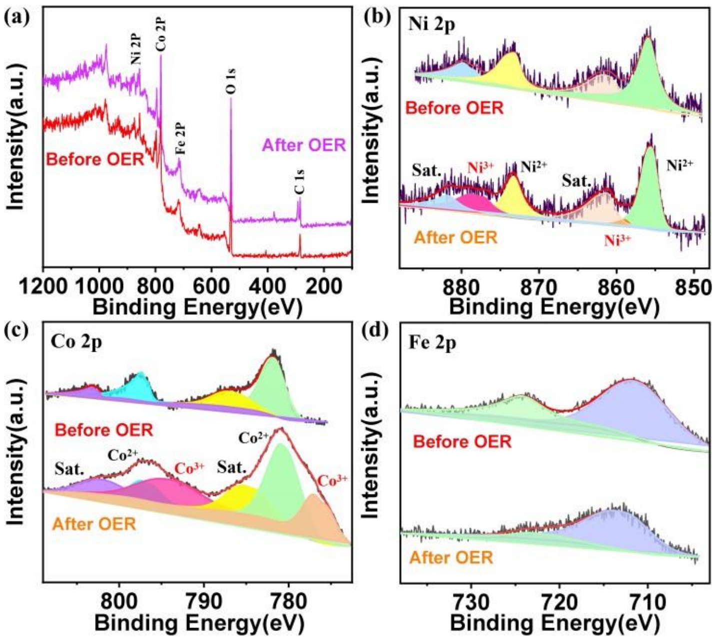

Fig. S10 XPS spectra of $Co(OH)_2$@NiFe-LDH/NF before and after OER test.

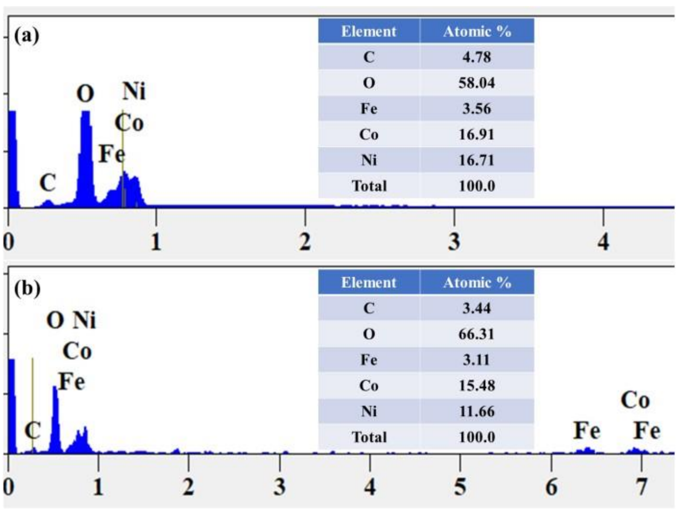

Fig. S11 EDS of $Co(OH)_2$@NiFe-LDH/NF (a) before and (b) after OER test.

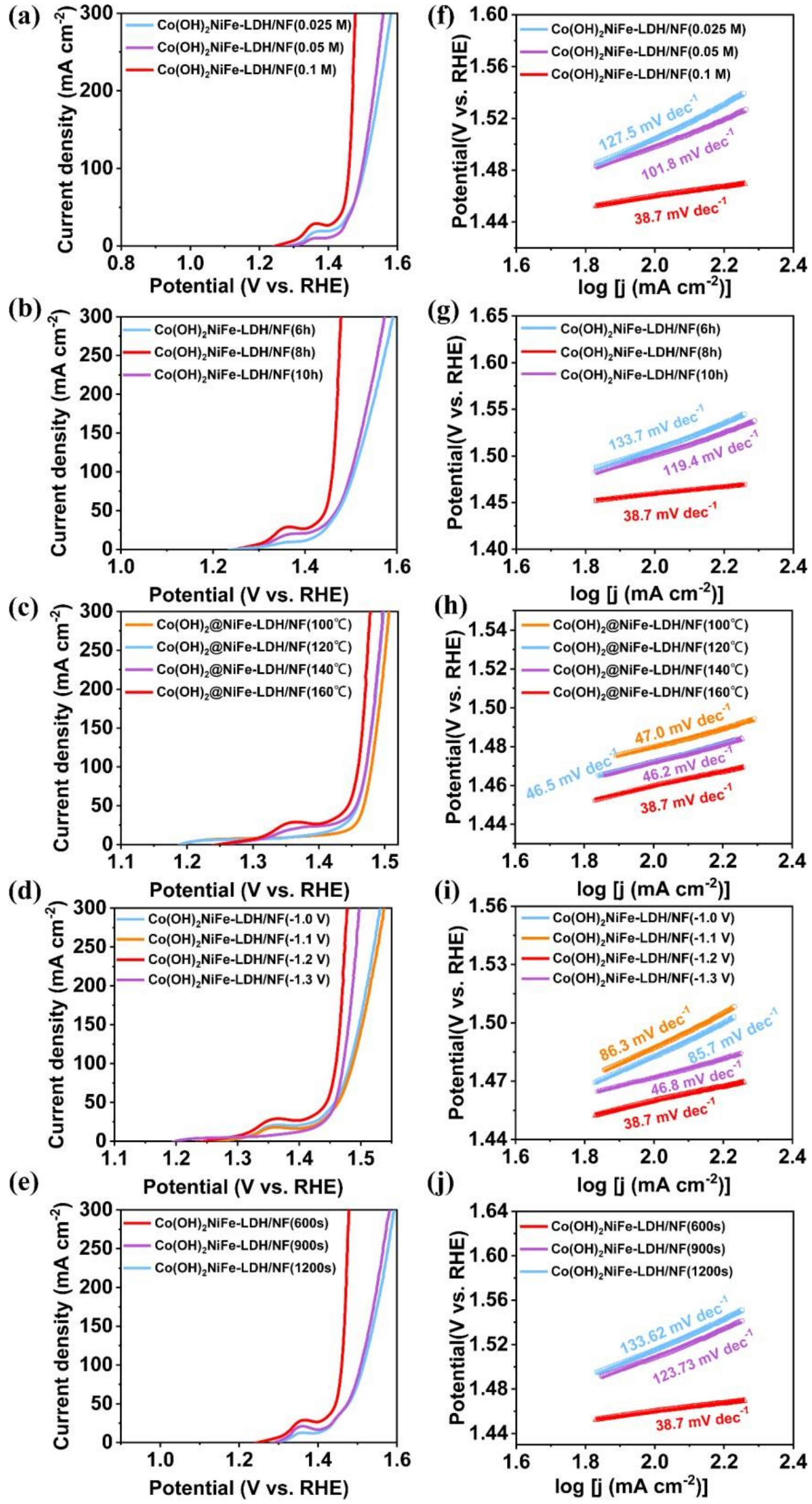

Fig. S12 a-e (Left) and f-j (Right) Polarization curves and Tafel plots of different conditions.

Table. S2 A comparison of the catalytic OER performance of recently reported catalysts in 1 M KOH solution.

Catalysts	Electrolyte	J / (mA m^{-2})	η_i / (mV)	Ref
$Co(OH)_2$@NiFe-LDH/NF	**1M KOH**	**50** **100**	**209** **229**	**This work**
NiSe@CoFe LDH/NF	1M KOH	100	236	1
Ni-Fe-W LDH/NF	1M KOH	100	247	2
NiFeCoP/NF	1M KOH	100	244.2	3
FeOOH/NiFe/NF	1M KOH	100	290	4
NiCoP@NiMn LDH/NF	1M KOH	100	293	5
NiFe-60/Co_3O_4@NF	1M KOH	50	221	6
cMOF/LDH	1M KOH	50	217	7
CoMoP/NiFe-LDH/NF	1M KOH	50	225	8
NiFe-LDH-Vo@NiCu	1M KOH	50	244	9
Nb-NiFe-LDH	1M KOH	50	242	10
NiFe-PO_X/NF	1M KOH	50	247	11
Ni_3S_2-NiFe LDHs /NF	1M KOH	50	230	12
CoO@NiFe-LDH/NF	1M KOH	20	225	13
Ru/NiFe LDH-F/NF	1M KOH	10	230	14
NiFeMn-LDH	1M KOH	10	310	15
CoFeV LDH/NF	1M KOH	10	242	16
CoO-Co_4N@NiFe-LDH	1M KOH	10	231	17

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