Electronic Supplementary Material (ESI) for Nanoscale Advances.

Boosting hydrogen generation by anodic oxidation of iodide over Ni-Co(OH)$_2$ nanosheet arrays

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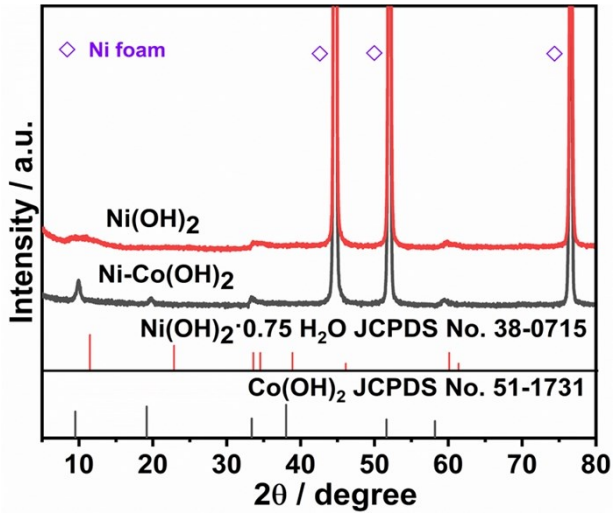

Figure S1. XRD patterns of Ni-$Co(OH)_2$ NSAs and $Ni(OH)_2$ NSAs.

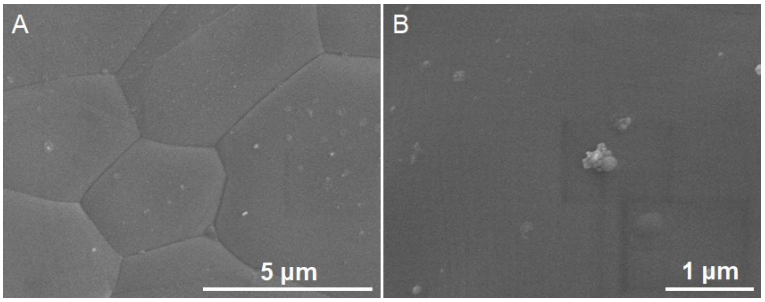

Figure S2. SEM images of pristine Ni foam substrate.

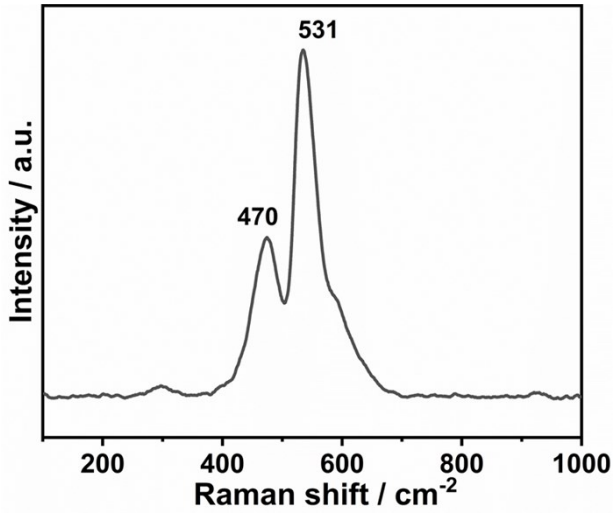

Figure S3. Raman spectra of the as-prepared Ni-$Co(OH)_2$ NSAs.

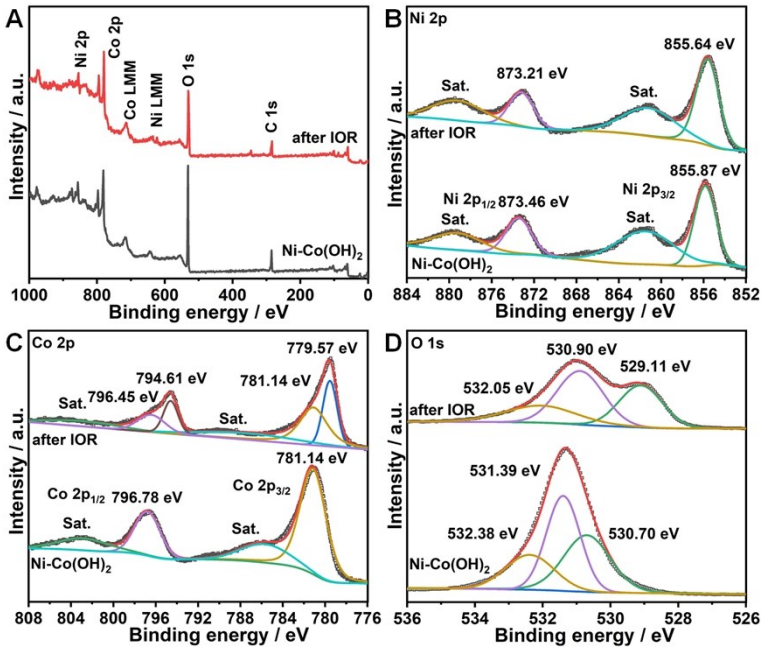

Figure S4. XPS survey spectra (A) and high -resolution XPS spectra of Ni 2p (B), Co 2p (C), and O 1s (D) of Ni-$Co(OH)_2$ NSAs before and after IOR performance.

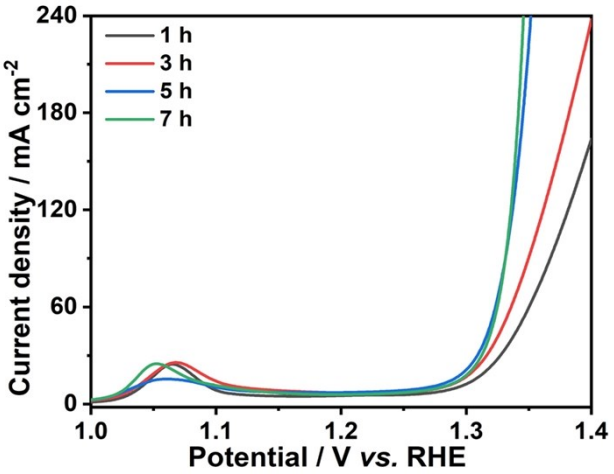

Figure S5. Polarization curves of IOR over Ni-$Co(OH)_2$ NSAs obtained at different time.

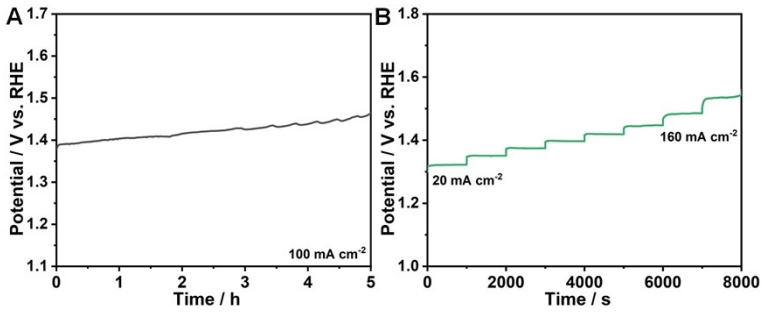

Figure S6. (A) Multi-current curve and (B) chronopotentiometry curve of Ni-$Co(OH)_2$ NSAs towards IOR.

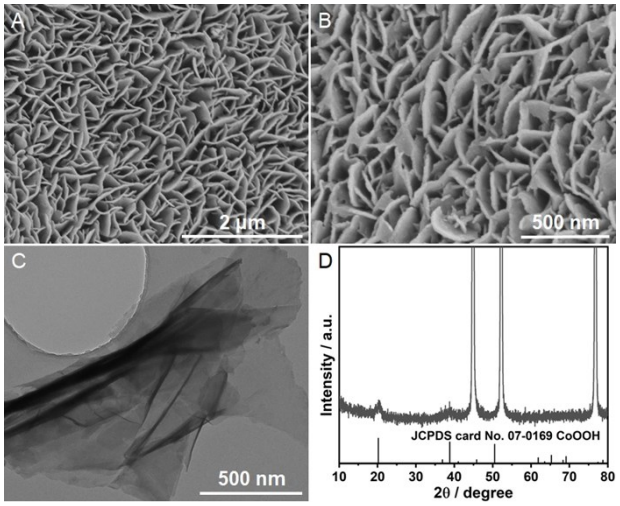

Figure S7. SEM (A,B), TEM (C) images and XRD pattern (D) of Ni-$Co(OH)_2$ NSAs after IOR.

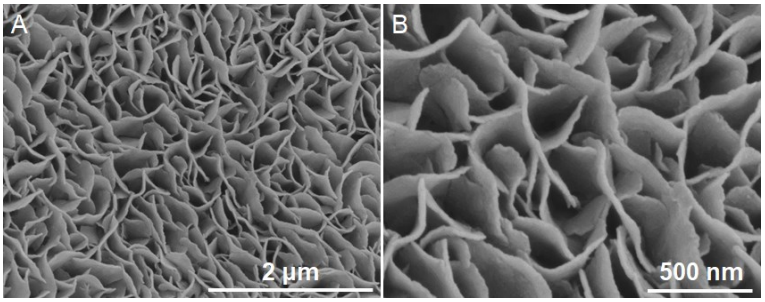

Figure S8. SEM images of Ni $(OH)_2$ NSAs.

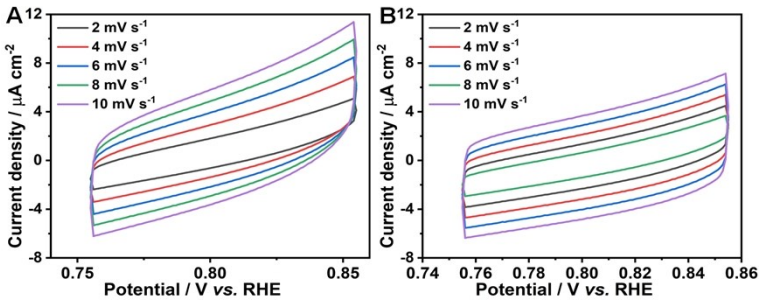

Figure S9. CV curves of Ni-$Co(OH)_2$ NSAs (A) and $Ni(OH)_2$ NSAs.

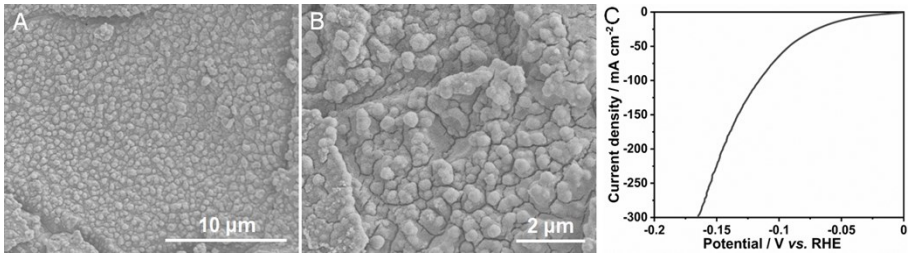

Figure S10. (A and B) FESEM images of Ni-Mo electrode, and (B) the corresponding polarization curve for HER.

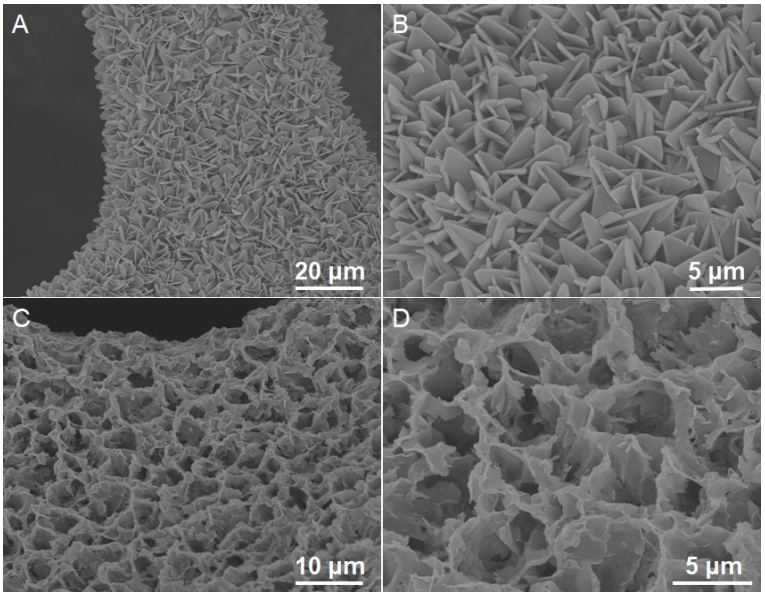

Figure S11. SEM images of ZIF-67 (A,B) and $Co(OH)_2$ NSAs (C,D).

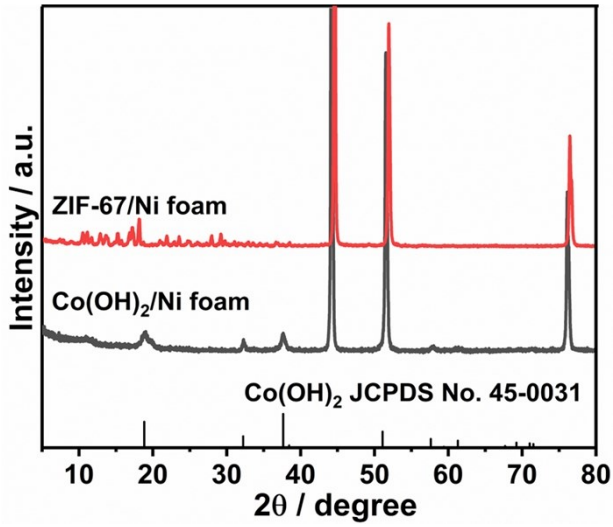

Figure S12. XRD patterns of ZIF-67 and $Co(OH)_2$ NSAs.

Table S1. Electrooxidation performance of the as-prepared catalyst compared with other documented electrocatalysts.

electrocatalyst	electrolyte	potential (V vs. RHE)	current density (mA cm^{-2})	stability@100 mA cm^{-2}	references
CoFeCr LDH/NF	1 M KOH + 0.33 M urea	1.305	10	20 h	*Appl. Catal. B,* **2020**, 272, 118959.
S-MnO_2	1 M KOH + 0.5 M urea	1.33	10	N/A	*Angew. Chem. Int. Ed.,* **2016**, 55, 3804.
Ni_3N NA/CC	1 M KOH + 0.33 M urea	1.35	10	N/A	*Inorg. Chem. Front.,* **2017**, 4, 1120.
MS-$Ni_2P/Ni_{0.96}S$/NF	1 M KOH + 0.5 M urea	1.442	100	20 h	*ACS Appl. Mater. Interfaces,* **2020**, 12, 2225.
FQD/CoNi-LDH/NF	1 M KOH + 0.5 M urea	1.36 1.42	10 100	N/A	*Chem. Eng. J.,* **2020**, 390, 124525.
C-350	1 M KOH + 0.5 M urea	1.337 1.402	10 100	at least 30 h	*ACS Sustainable Chem. Eng.,* **2020**, 8, 7414.
CoMn/$CoMn_2O_4$	1 M KOH + 0.5 M urea	1.32 1.36	10 100	N/A	*Adv. Funct. Mater.,* **2020**, 30, 2000556.
NiIr-MOF/NF	1 M KOH + 0.5 M urea	1.345 1.349	50 100	N/A	*Chem. Commun.,* **2020**, 56, 2151.
MoS_2/CoS/$Co_{0.85}Se$ HNT	1 M KOH + 0.5 M urea	1.38	50	N/A	*Nanoscale*, **2020**, 12, 991.
NF/NiMoO-Ar	1 M KOH + 0.5 M urea	1.37 1.42	10 100	N/A	*Energy Environ. Sci.,* **2018**, 11, 1890.
Ni_xB	1 M KOH + 10 mM HMF	1.45	100	N/A	*Angew. Chem. Int. Ed.*, **2018**, 57, 11460.
Ni_2P NPA/NF	1 M KOH + 10 mM HMF	1.35 oneset potential	N/A	N/A	*Angew. Chem. Int. Ed.,* **2016**, 55, 9913.
$NiCo_2O_4$	1 M KOH + 5 mM HMF	1.53	14.83	N/A	*Appl. Catal. B,* **2019**, 242, 85.
Ni_3S_2/NF	1 M KOH + 10 mM HMF	1.35 oneset potential	N/A	N/A	J. Am. Chem. Soc. **2016**, 138, 13639.
Ni-$Co(OH)_2$ NSAs	1 M KOH + 0.33 M KI	1.30 1.32 1.33	20 50 100	5 h	This work
$Co(OH)_2$ NSAs	1 M KOH + 0.33 M KI	1.31 1.33 1.35	20 50 100	N/A	This work