

Supporting Information

***In-Situ* Growth of NiCo-MOF and the Derived NiCo₂O₄/NiCo₂O₄/Ni foam Composite with Wire-Penetrated- Cage Hierarchical Architectures for Efficient Oxygen Evolution Reaction**

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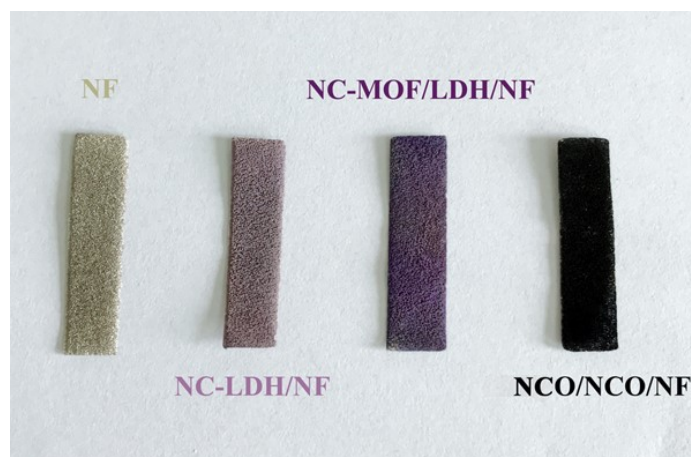


Figure S1 Optical image of NF, NC-LDH/NF, NC-MOF/LDH/NF and NCO/NCO/NF electrode.

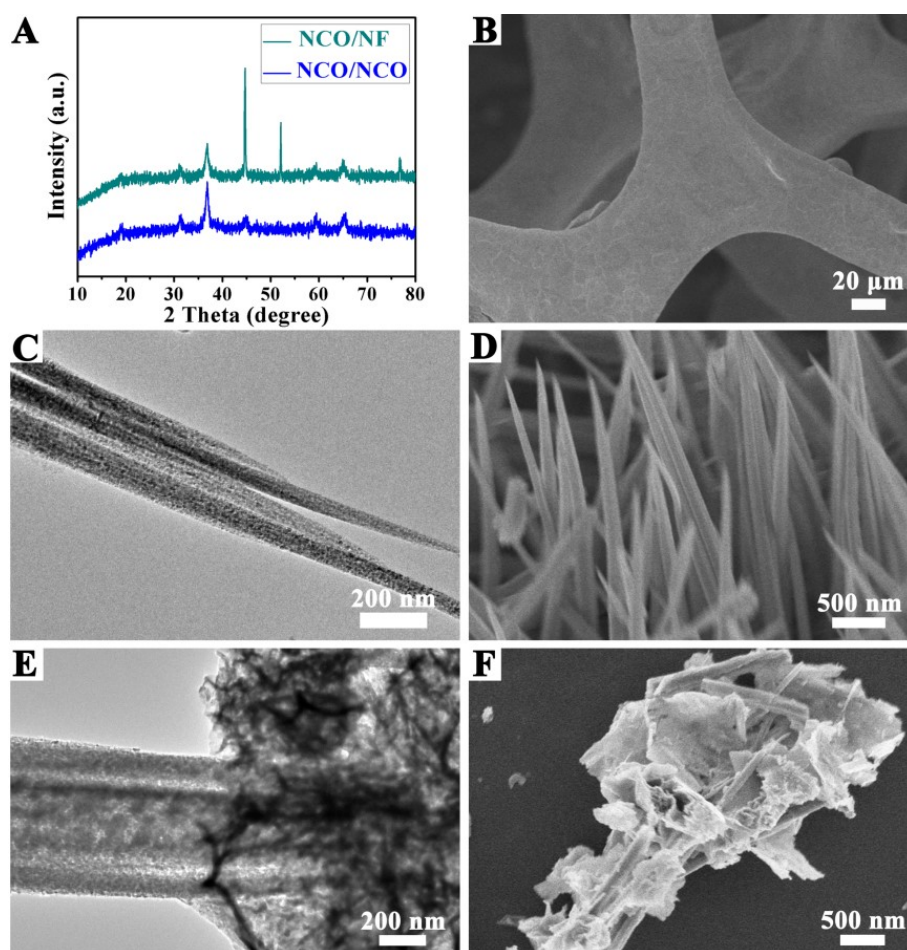


Figure S2 (A) XRD patterns of the NCO/NF and NCO/NCO. (B) SEM image of NF. TEM and SEM images of (C, D) NCO/NF and (E, F) NCO/NCO.

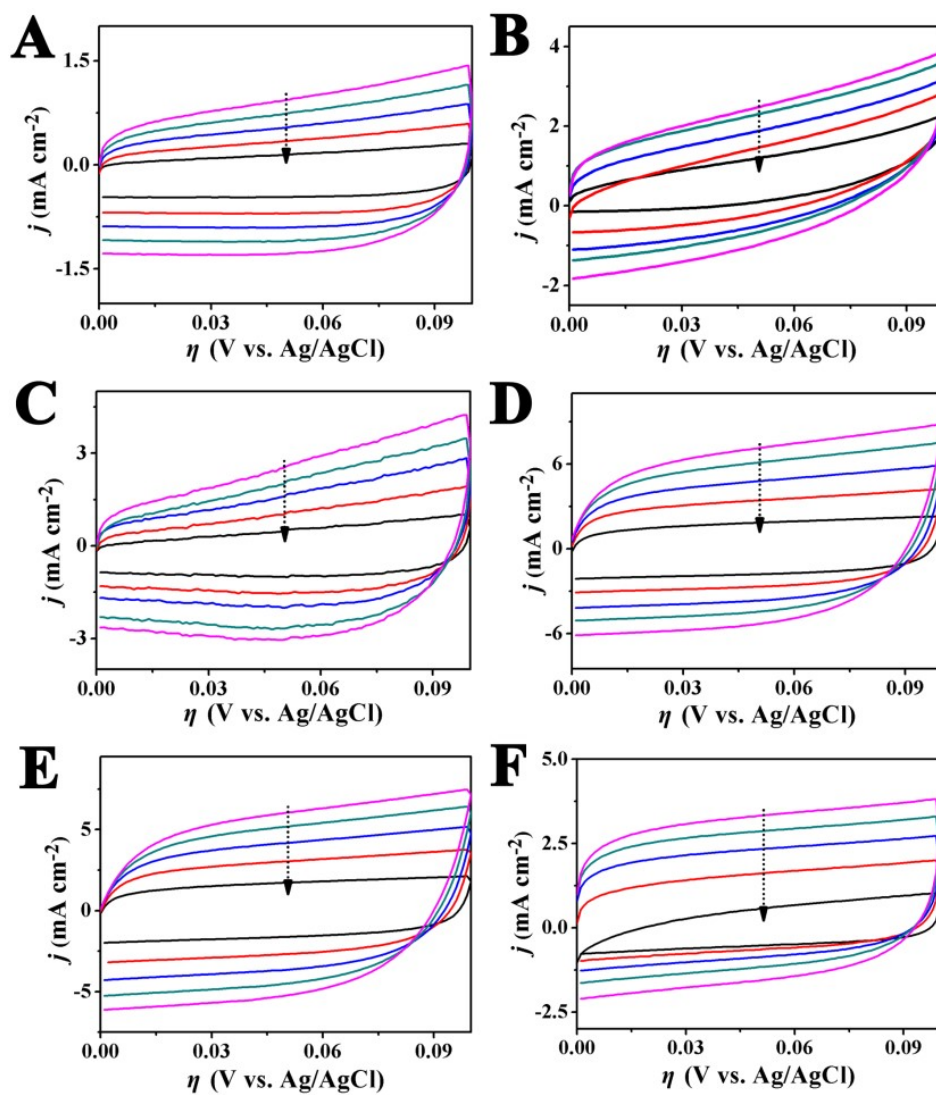


Figure S3 CV curves of (A) NF, (B) NC-LDH/NF, (C) NC-MOF/LDH/NF, (D) NCO/NCO/NF, (E) NCO/NF and (F) NCO/NCO in the potential range of 0.00 to 0.10 V vs. Ag/AgCl (non-Faradaic region) at different scan rates (20 - 100 mV s^{-1}).

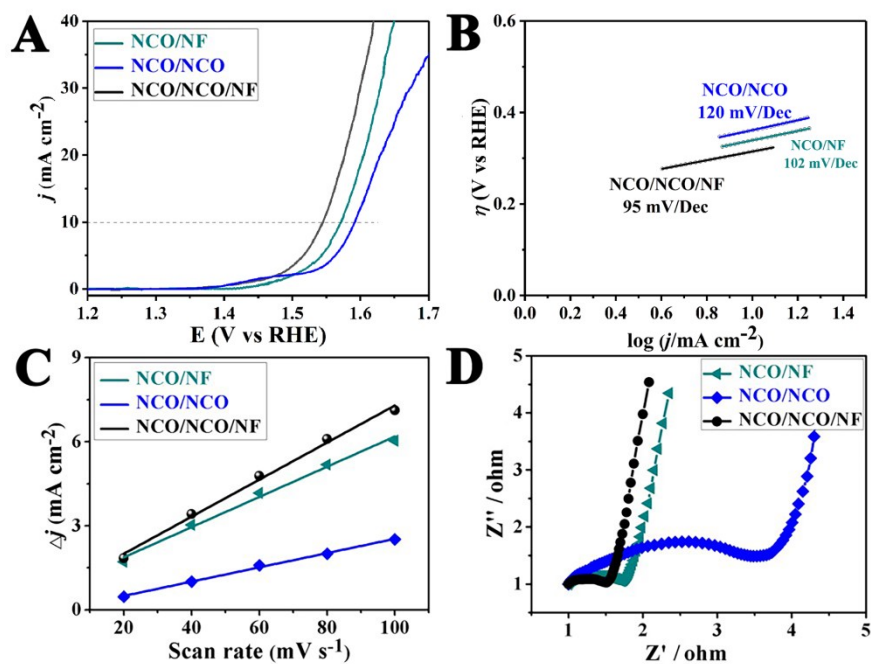


Figure S4 (A) Linear scan voltammograms (LSV) plots, (B) Tafel plots, (C) the differences in current density plotted against scan rate for estimation of double-layer capacitance (C_{dl}), and (D) Nyquist plots of the NCO/NF, NCO/NCO and NCO/NCO/NF in 0.1 M KOH.

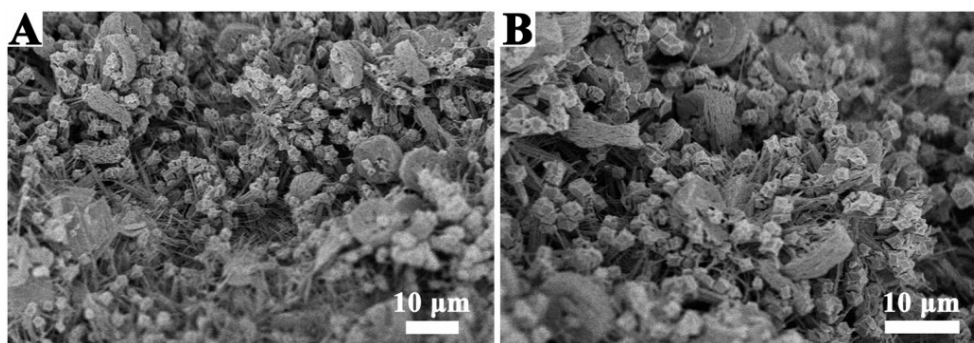


Figure S5 SEM images of NCO/NCO/NF composite after 100 h of the catalytic oxidation reaction (A) and 2000 cycles (B), respectively.

Table S1. Comparison of OER activities for various NiCo₂O₄ NWs based composites.

Catalyst	Substrate ^[c]	<i>j</i> (mA cm ⁻²)	<i>η</i> (mV)	Tafel slope (mV Dec ⁻¹)	Loading amount of catalyst (mg cm ⁻²)	Ref.
NiCo@NiCoO ₂ /C PMRAs ^[a]	CFC	10	340	83.97	3.2	[1]
NiCo ₂ O ₄ /NiCo ₂ O ₄ NWs ^[a]	GO	10	373	63.1	--	[2]
MnO ₂ /NiCo ₂ O ₄ / NF ^[a]	Ni foam	10	340	139	--	[3]
NiCo ₂ O ₄ /NiO/GO ^[a]	GO	10	350	66	--	[4]
NiCo ₂ O ₄ NWs ^[a]	Ni foam	9.46	550	68	--	[5]
Fe _{0.5} Ni _{0.5} Co ₂ O ₄ NWs ^[a]	Ni foam	10	350	27	--	[6]
NiCo ₂ O ₄ NWs ^[a]	Ti foil	0	500	62	0.33	[7]
NiCo ₂ O ₄ NA/CC ^[a]	CC	0	320	90	0.43	[8]
NiCo ₂ O ₄ nanoneedles ^[a]	FTO	10	565	292	0.53	[9]
CFP/NCO/ Co _{0.57} Ni _{0.43} ^[b]	CFP	10	340	63	1.477	[10]
NiMn-LDH/ NiCo ₂ O ₄ NWs ^[a]	Ni foam	10	310	99	5.4	[11]
NiCo ₂ O ₄ NWs ^[a]	Ni foam	10	363	121	2.5	[11]
NCO/NCO/NF^[b]	Ni foam	10	320	80	1	This work

All experiments are performed in 1.0 [a] and 0.1 [b] M KOH electrolyte, respectively. [c] CFC = Carbon Fiber Cloth GO = Graphite Oxide, GCE = Glassy Carbon Electrode, CC = Carbon Cloth, FTO = Fluorine doped Tin Oxide, CB = Carbon Black, CFP = Carbon Fiber Paper.

References

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