Electronic Supplementary Material (ESI) for CrystEngComm.

Supplementary information

Room Temperature and Rapid Synthesis of Two-Dimensional Bimetallic NiCo-CAT MOF by an Electrochemical strategy for Enhancing Electrocatalytic Oxygen Evolution Reaction

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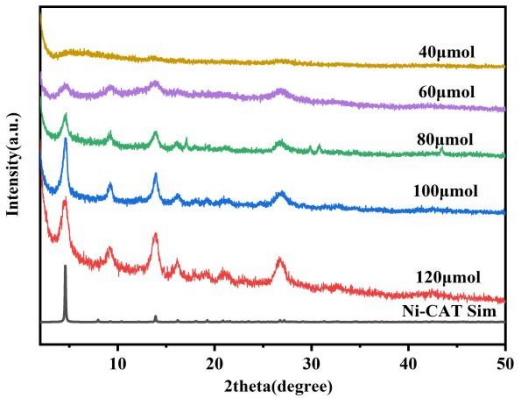


Figure S1. XRD patterns of Ni-CAT materials synthesized with different amounts of ligand.

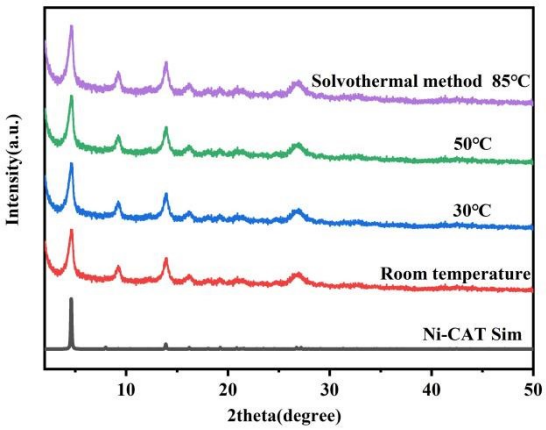


Figure S2. XRD patterns of Ni-CAT materials synthesized at different temperatures.

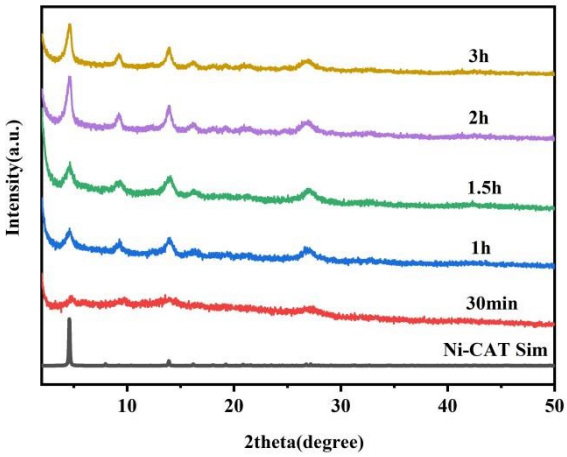
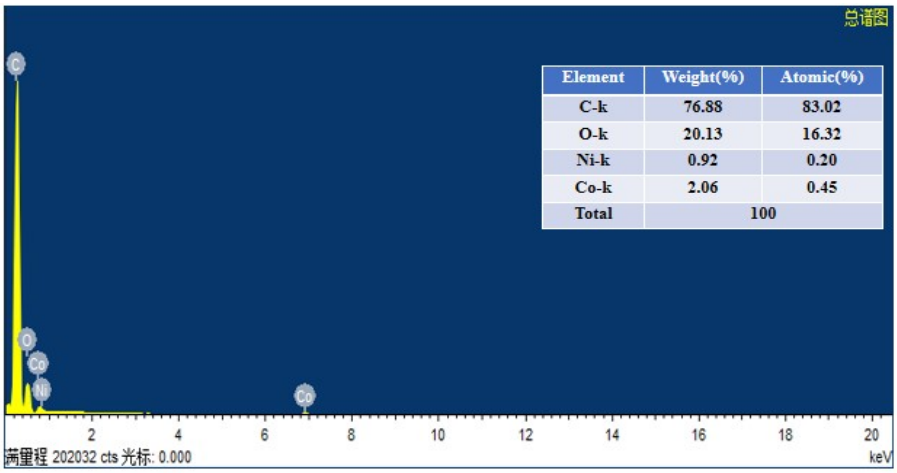


Figure S3. XRD patterns of Ni-CAT materials synthetic with different reaction times.



Element	Weight(%)	Atomic(%)
C-k	76.88	83.02
O-k	20.13	16.32
Ni-k	0.92	0.20
Co-k	2.06	0.45
Total	100	

Figure S4. EDS results for NiCo-CAT.

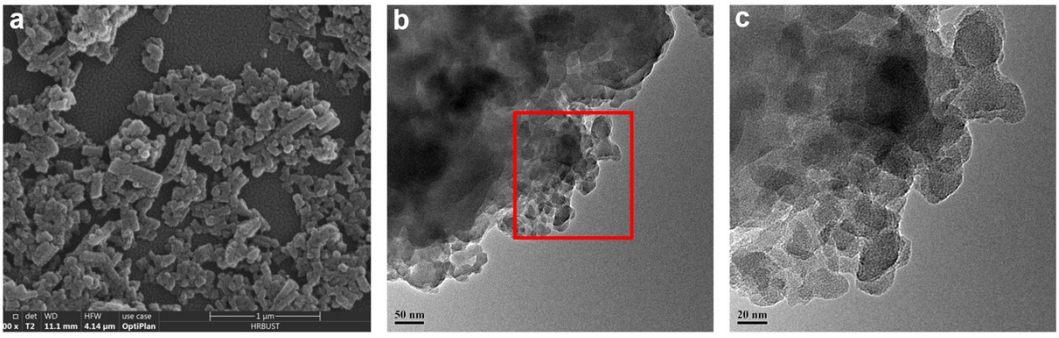
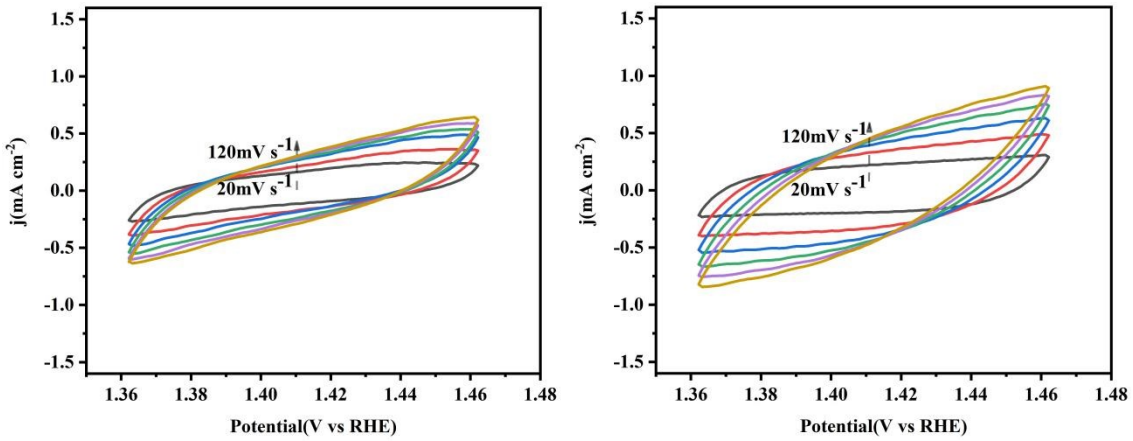
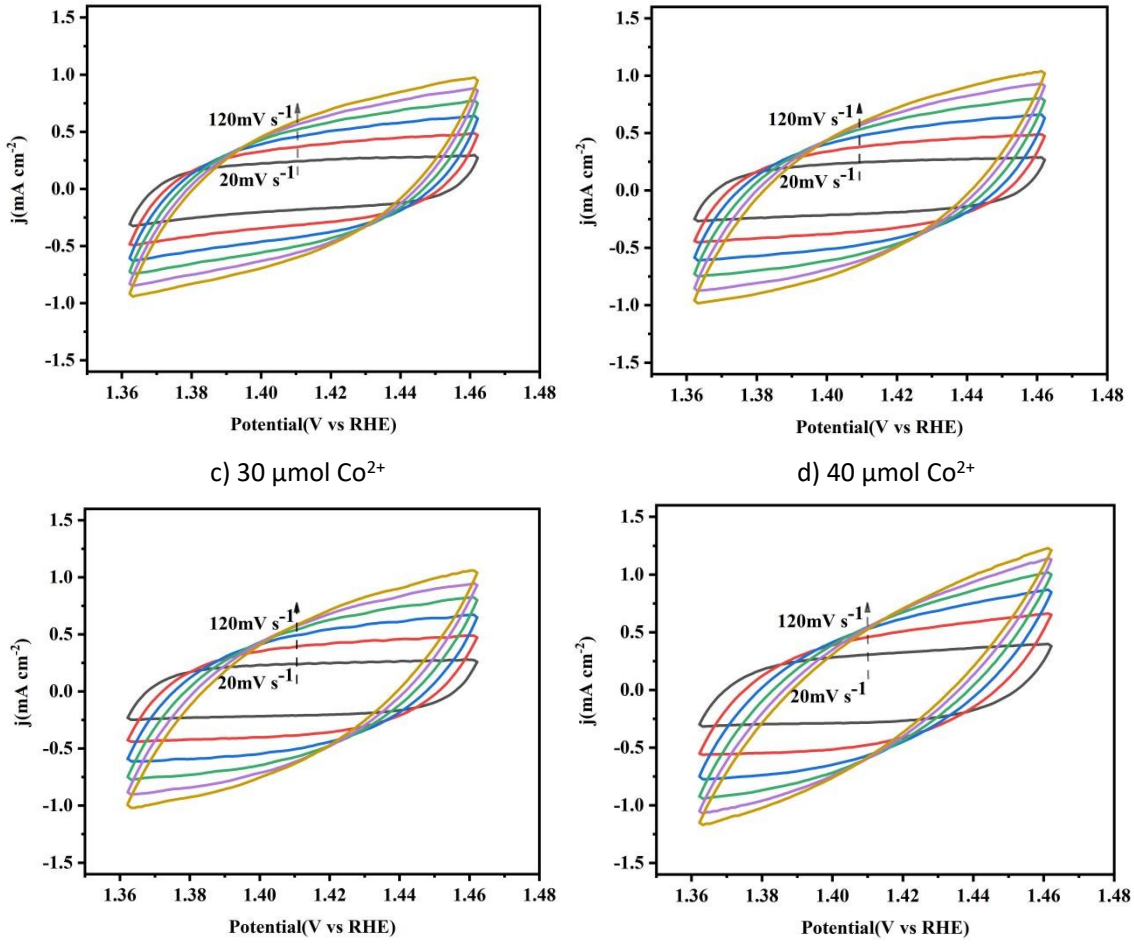


Figure S5. SEM (a) and TEM (b-c) images for NiCo-CAT.



a) Ni-CAT

b) 20 µmol Co^{2+}



c) 30 μmol Co^{2+} d) 40 μmol Co^{2+}

e) 50 μmol Co^{2+} f) 60 μmol Co^{2+}

Figure S6. a-f) CV maps of Ni-CAT and NiCo-CAT with different metal Co^{2+} dosages at different scanning rates (20, 40, 60, 80, 100 and 120 mV s^{-1})

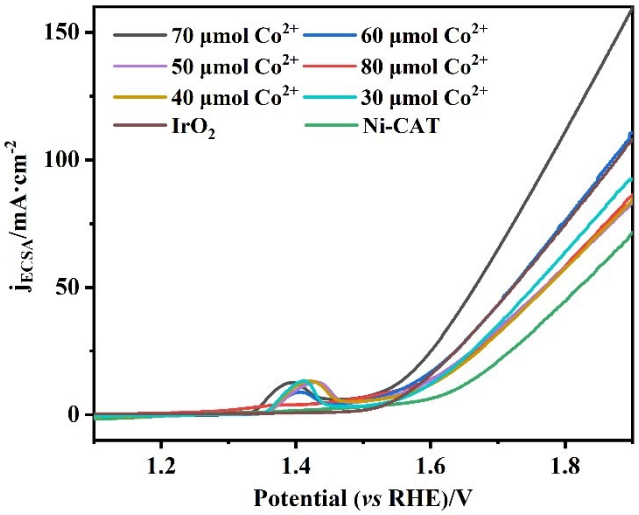


Figure S7. LSV curves of NiCo-CAT with different Co^{2+} dosages normalized by the calculated ECSA values.

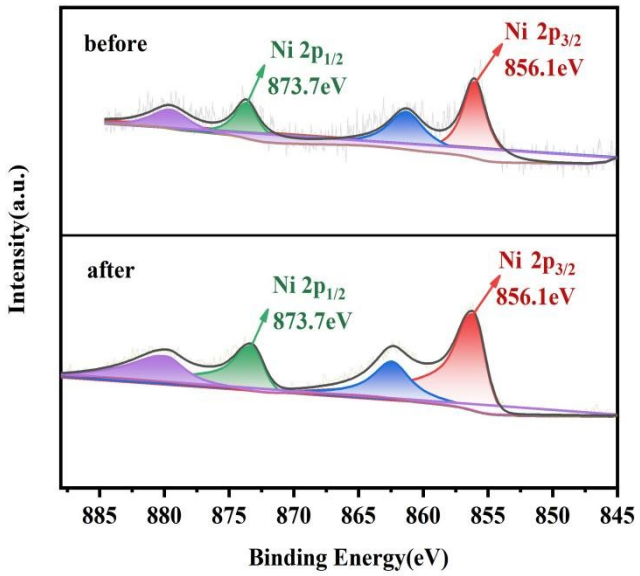


Figure S8. XPS high resolution spectra of Ni 2p before and after OER reaction.

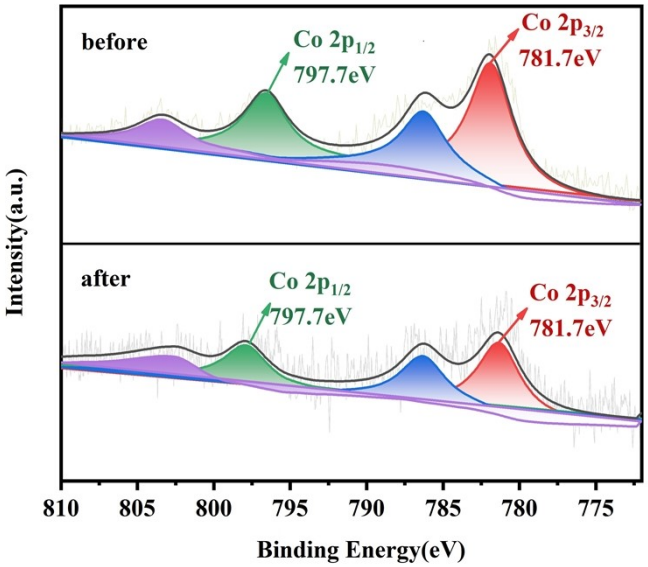


Figure S9. XPS high resolution spectra of Co 2p before and after OER reaction.

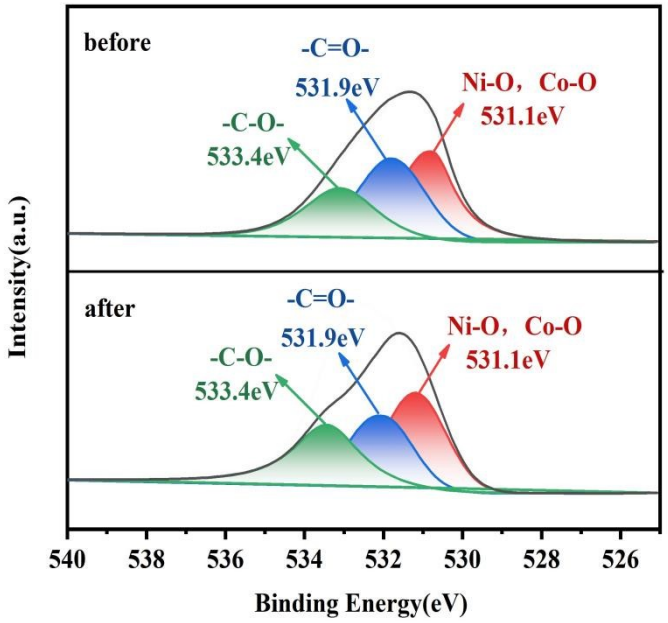


Figure S10. XPS high resolution spectra of O 1s before and after OER reaction.

Table S1. Comparison of OER performance for electrocatalysts in this work and some other recently reported bi-metallic MOFs-based electrocatalysts.

Catalysts	η_{10} (mV)	Substrate	Ref.
NiCo-CAT	307	CC	This work
NH_2–CoFe MOF	358@200 mA cm^{-2}	NF	CrystEngComm, 2023,25, 5387-5398
MoS_2@Fe/Ni-MOF_{600}-3	340	NF	Fuel, 2023, 339, 127395
$Fe(py)_2Ni(CN)_4$	285	GC	Inorg. Chem. 2022, 61, 18, 7095–7102
Co-Fe/Ni@HPA-MOF	320	GC	J. Solid State Chem. 2019, 272, 32-37
CoFe-MOF	355	GC	Catal. Sci. Technol. 2020, 10, 3897-3903.
NNU-23	365	CC	Angew. Chem., Int. Ed. 2018, 57, 9660-9664
MAF-X27-OH	292	Cu Foil	J. Am. Chem. Soc. 2016, 138, 8336-8339.
NiCo-UMOFNs	250	GC	Nat. Energy 2016, 1, 1-10.
Fe_3-Co_2@GC	283	GC	J. Am. Chem. Soc. 2017, 139, 1778-1781.
Co:Fe_3@GC	453	GC	J. Am. Chem. Soc. 2017, 139, 1778-1781
Co-10Ni-B-sp	310	GC	Nanoscale 2018, 10, 11997-12002.
Co-B/ZIF-67	320	GC	Electrochem. Commun. 2018, 86, 140-144
NiFe-NHCNPs	350	CP	Chem. - Asian J. 2018, 13, 3274-3280.
CoFe-PYZ	300	GC	ACS Appl. Energy Mater. 2018, 1, 5140-5144.
Co-WOC-1	390@1 mA cm^{-2}	GC	Angew. Chem., Int. Ed. 2016, 55, 2425-2430.

NF: nickel foam, GC: glassy carbon, CC: carbon cloth, CP: carbon paper.