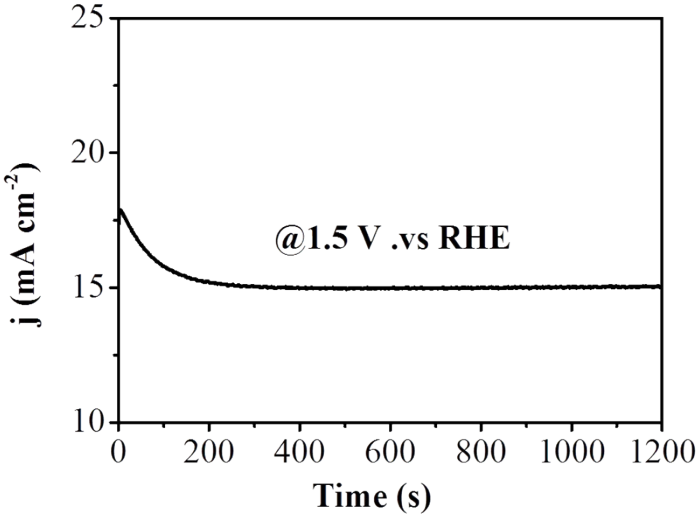

Fig. S1 The i-t changing curve during the preparation of Co_3O_4/CoOOH.

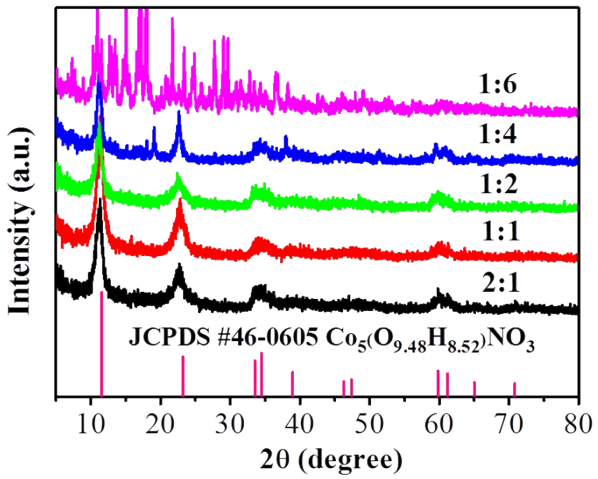

Fig. S2 XRD patterns of various samples obtained under different molar ratio of 2-methylimidazole/$Co(NO_3)_2$ from0.5/1 to 6/1.

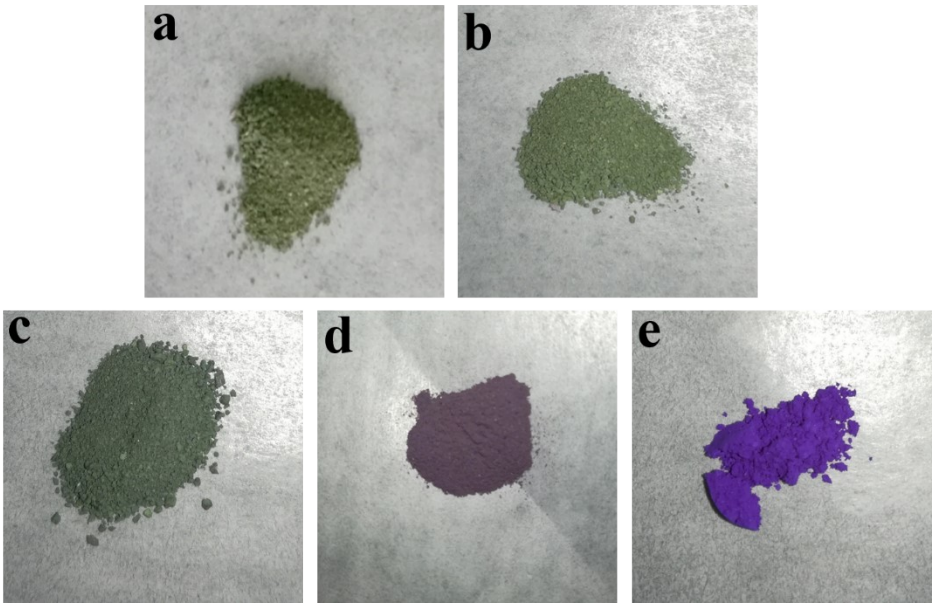

Fig. S3 a-e) Optical photographs of various samples obtained under different molar ratio of 2-methylimidazole/$Co(NO_3)_2$ from0.5/1 to 6/1

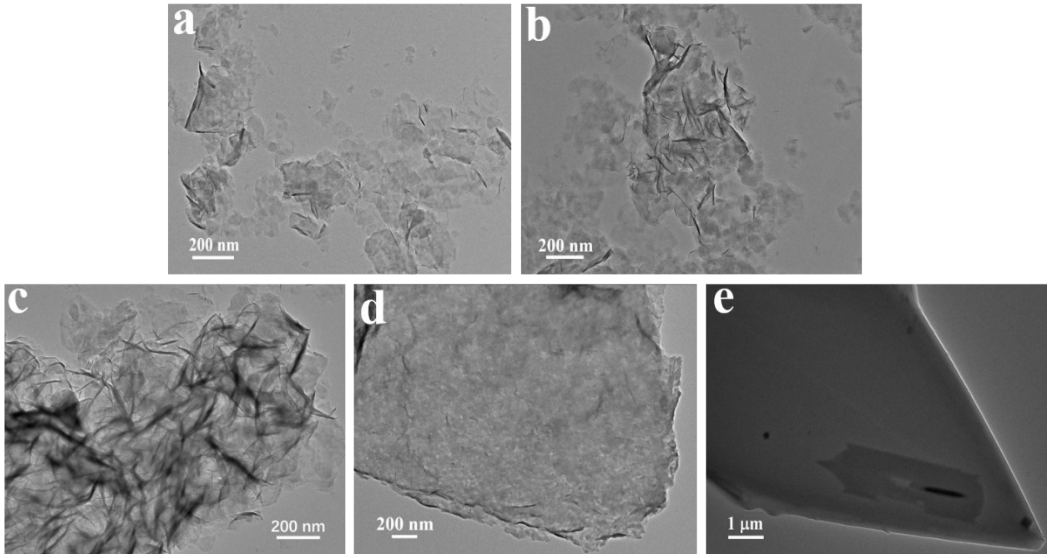

Fig. S4 a-e) TEM images of various samples obtained under different molar ratio of 2-methylimidazole/$Co(NO_3)_2$ from0.5/1 to 6/1.

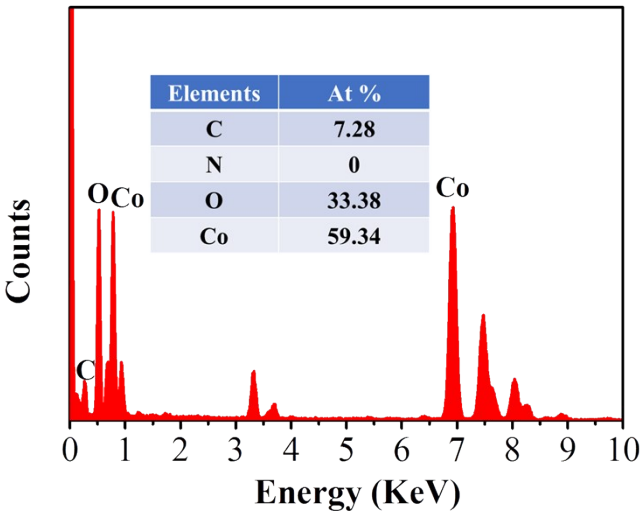

Fig. S5 EDX spectrum of Co_3O_4/CoOOH nanosheets

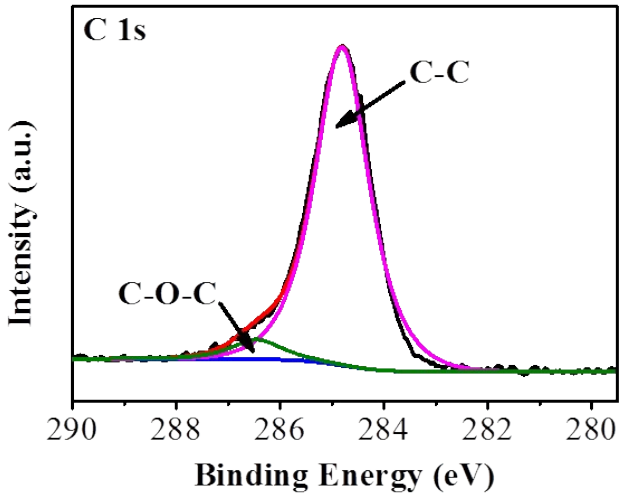

Fig. S6 C 1s high-resolution XPS spectra for $Co_5(O_{9.48}H_{8.52})NO_3$ nanosheets measurement.

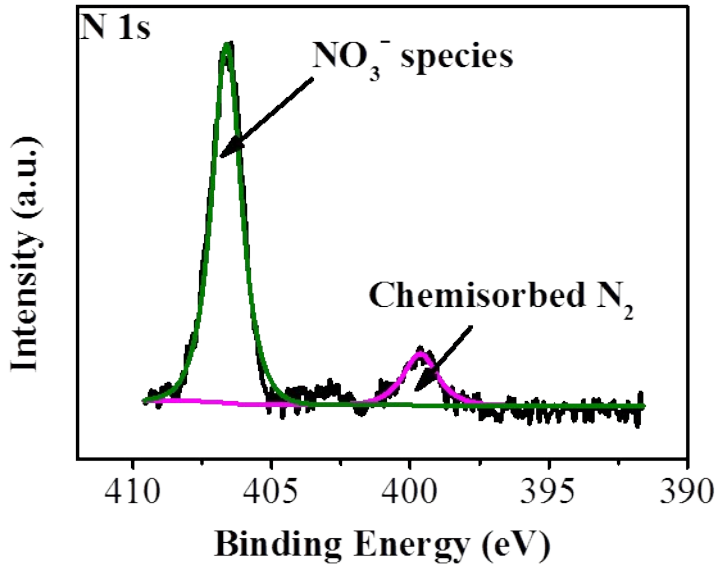

Fig. S7 N 1s high-resolution XPS spectra for $Co_5(O_{9.48}H_{8.52})NO_3$ nanosheets.

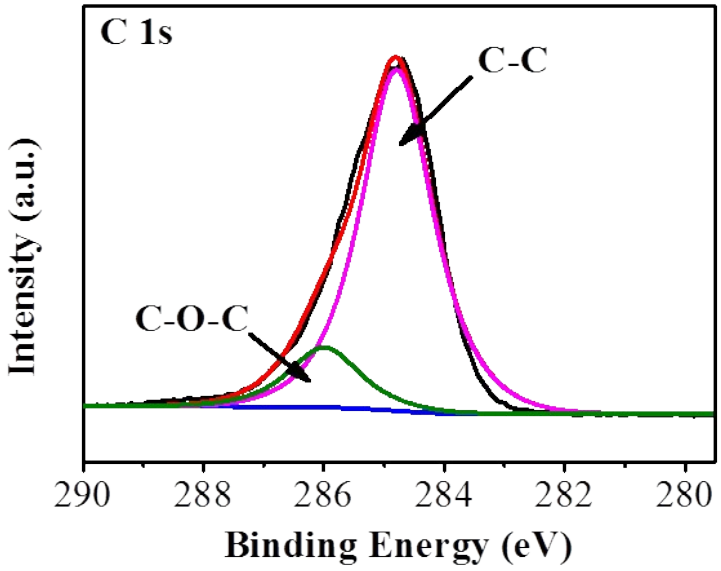

Fig. S8 C 1s high-resolution XPS spectra for Co_3O_4/CoOOH nanosheets measurement.

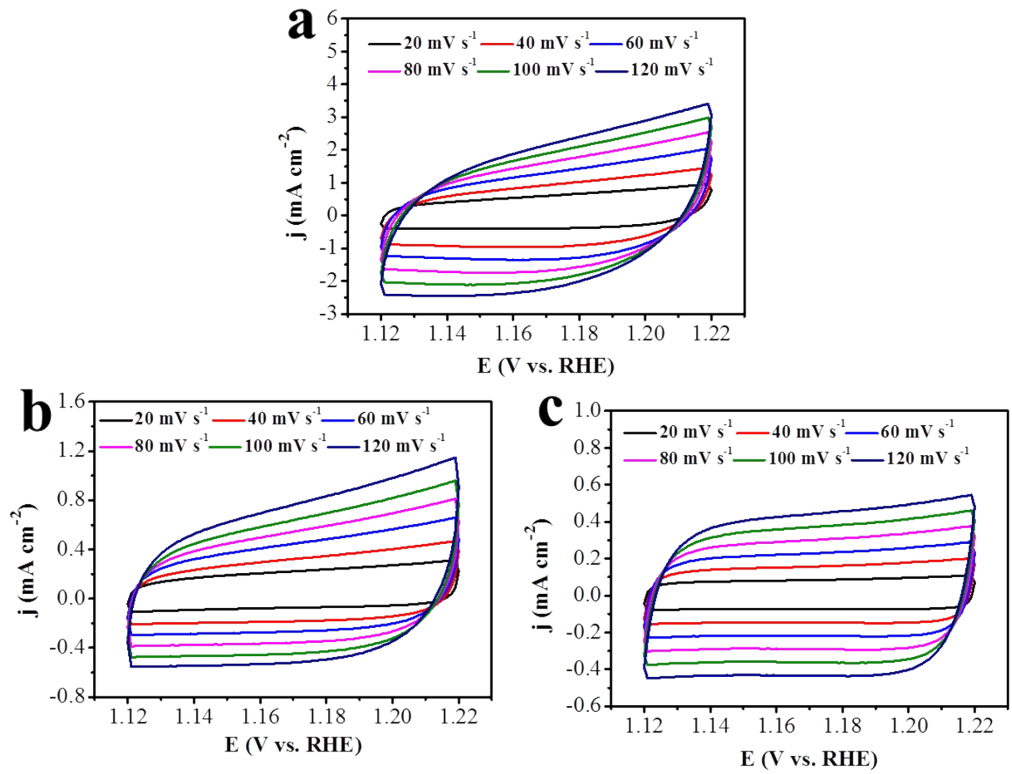

Figure S9 CVs performed at various scan rates (20, 40, 60, 80, 100, and 120 mV s^{-1}) from 1.12 to 1.22 V vs. RHE for a) Co_3O_4/CoOOH, b) α-$Co(OH)_2$ and c) Co-MOF.

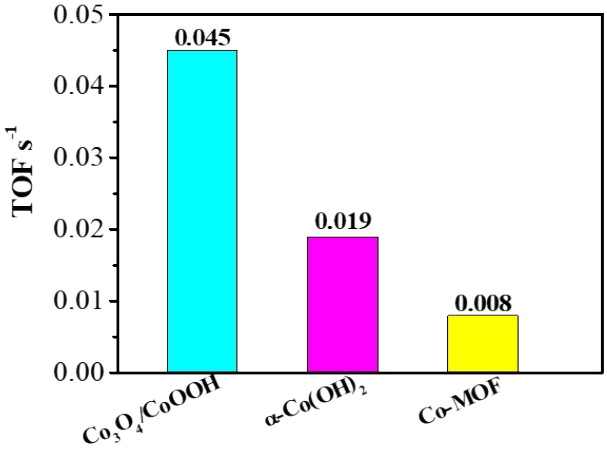

Figure S10 TOF values calculated from the current at an overpotential of 260 mV for Co_3O_4/CoOOH□α-$Co(OH)_2$ Co-MOF

Table S1 Activity comparison with the recently reported electrocatalysts in alkaline solution

Catalyst	η_{10} (mV)	Tafel slope (mV dec^{-1})	C_{dl} (mF cm^{-2})	Ref.
Co_3O_4/CoOOH	260	52	39.9	This work
FeCoZn-SACs	280	101	/	*ACS Nano*, 2023, **17**, 18128-18138.
MXene/$NiFeP_x$-NC	240	81.2	9.4	*J. Adv. Ceram.*, 2023, **12**, 553-564.

$Mo_6Co_6C_2$/Co/HNC-1	284	68.5	20.3	*J. Colloid. Interf. Sci.*, 2023, **636**, 450-458.
Cu@$Cu(OH)_2$ NRs/HKUST-1	310	167.5	/	*Nano. Res.*, 2023, **16**, 8012-8017.
CoO@SCoTe	246	56	13.9	*Adv. Sci.*, 2023, **10**, 2206204.
$Mo_{0.9}Ni_{0.05}Fe_{0.05}O_2$	249	58.6	3.53	*Chem. Eng. J.*, 2022, **443**, 136339.
IrFe-N-C	350	43	/	*ACS Catal.*, 2022, **12**, 9397-9409.
CoTAPP-PATA-COF	420	56	10.64	*Angew. Chem. Int. Ed.*, 2022, **61**, e202213522.
NP-ACSs@NiFe-MOFs	230	45.8	36	*Adv. Funct. Mater.*, 2023, 2301013.
O-Co-N/C	290	86	/	*Adv. Funct. Mater.*, 2022, **32**, 2200763.
NCOSH	243	63	27.3	*Adv. Energy Mater.*, 2022, **12**, 2103275.
$CoCo_2O_4$/NCNTs	350	159.7	7.12	*Angew. Chem. Int. Ed.*, 2022, **61**, e202114696.
S-FeOOH/IF	244	59	4.64	*Adv. Funct. Mater.*, 2022, 2112674.
Ni SAs@S/N-FCS	249	56.5	2.63	*Angew. Chem. Int. Ed.*, 2022, **61**, e202212542