One-Pot Chloride-Assisted Corrosion Engineering of Nanostructured NiMoCo for Enhanced Alkaline Hydrogen Evolution

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Supplementary figures

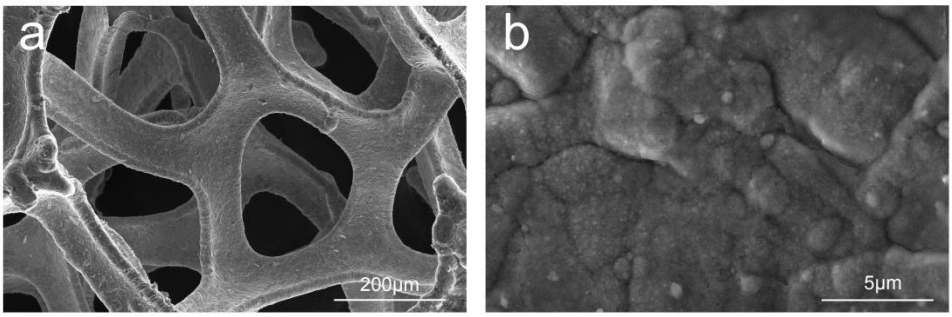

Figure S1. SEM images of (a-b) NMF at different scales.

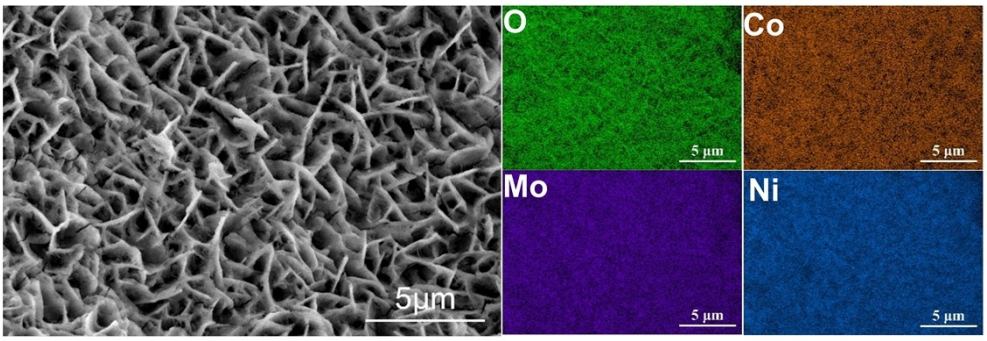

Figure S2. SEM image and corresponding EDS elemental mapping images of Ni, Mo, Co, and O acquired from the same region.

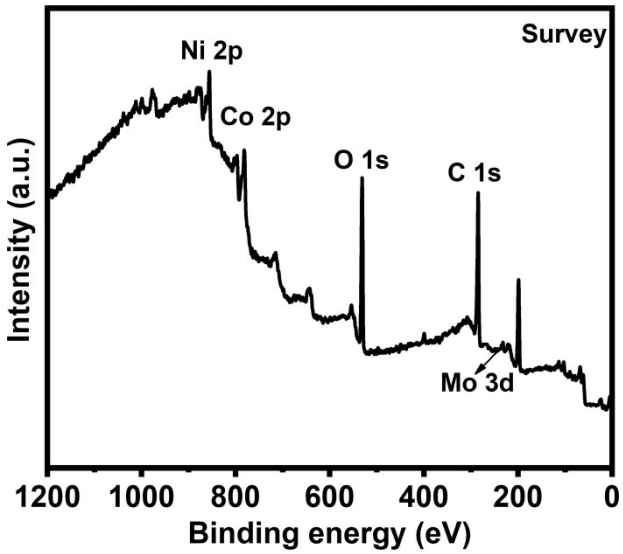

Figure S3. Full survey XPS spectra of NiMoCo.

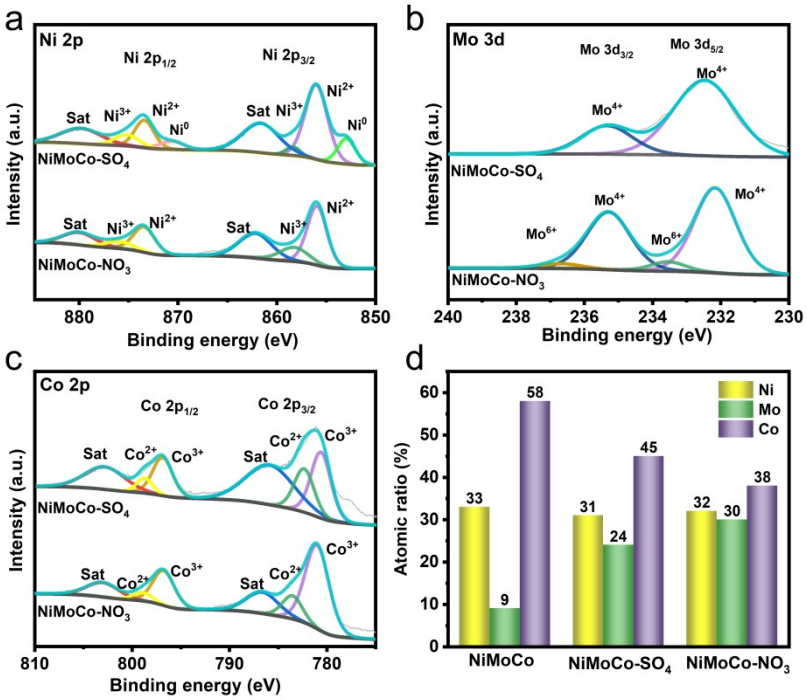

Figure S4. High-resolution XPS spectra of (a) Ni 2p, (b) Mo 3d, and (c) Co 2p for NiMoCo-SO_4 and NiMoCo-NO_3; (d) Surface elemental composition for NiMoCo, NiMoCo-SO_4, and NiMoCo-NO_3.

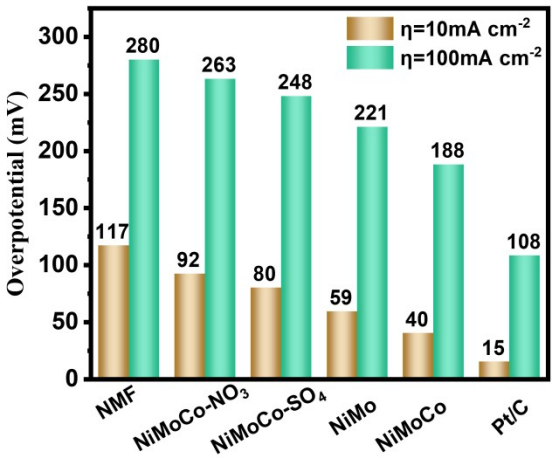

Figure S5. HER overpotentials at 10 and 100 mA·cm^{-2} for various catalysts measured in 1 M KOH.

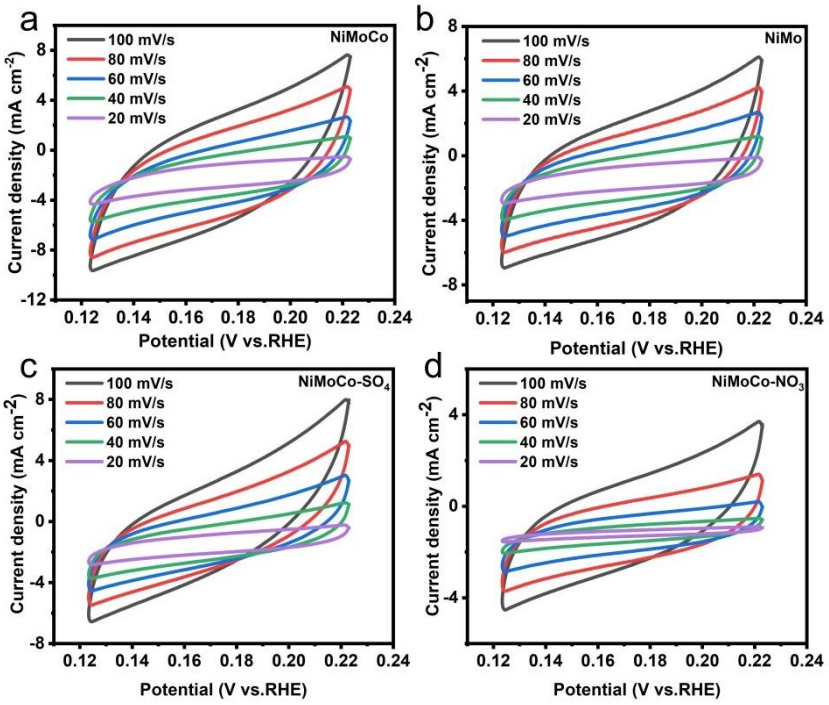

Figure S6. CV curves recorded at different scan rates for (a) NiMoCo, (b) chloride-assisted NiMo, (c) NiMoCo-SO_4, and (d) NiMoCo-NO_3 in 1 M KOH solution.

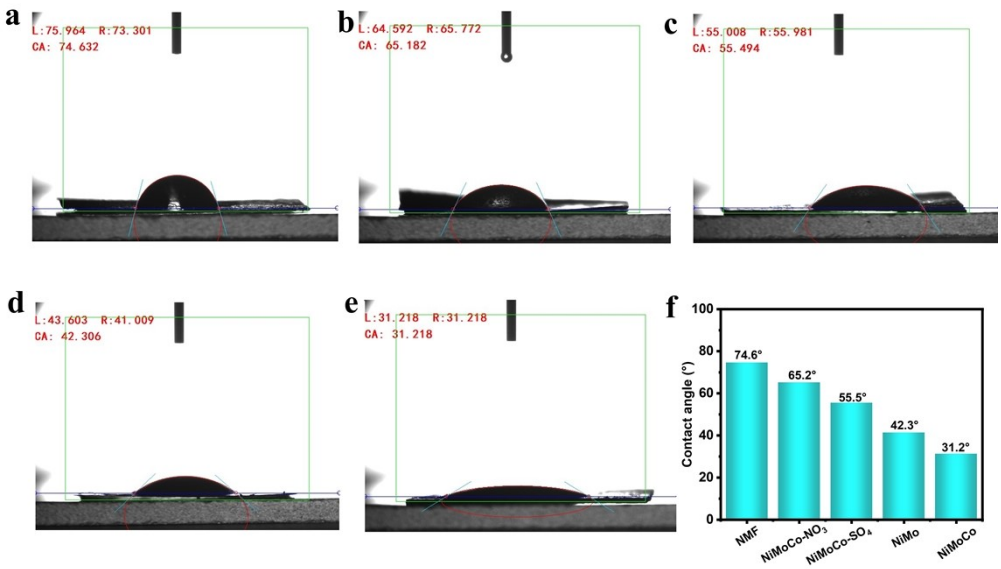

Figure S7. (a) Static water contact angle image of pristine NMF without corrosion treatment. (b-e) Static water contact angle images of corrosion-treated electrodes prepared via different anionic environments: (b) NiMoCo-NO_3, (c) NiMoCo-SO_4, (d)

chloride-assisted corroded NiMo, and (e) chloride-assisted corroded NiMoCo. (f) Corresponding contact angle values of the different samples.

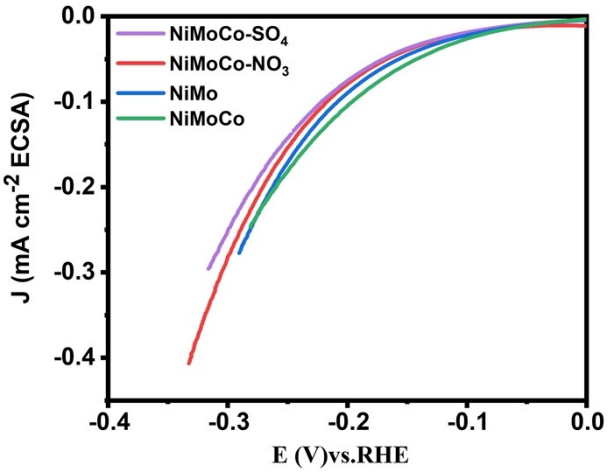

Figure S8. ECSA-normalized LSV curves for NiMoCo, chloride-assisted NiMo, NiMoCo-SO_4, NiMoCo-NO_3, and NMF in 1 M KOH.

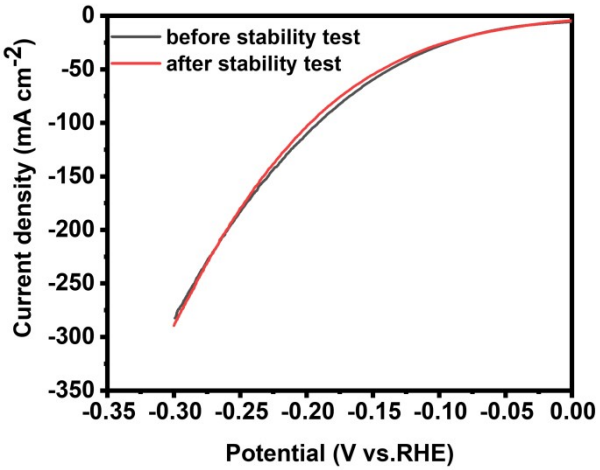

Figure S9. LSV curves of NiMoCo before and after 48-hour HER stability test.

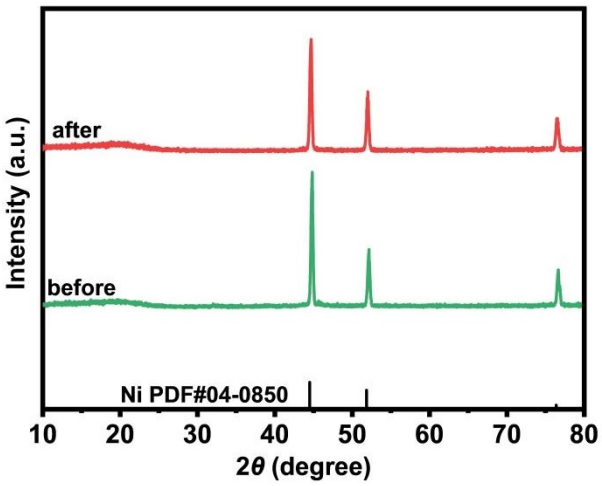

Figure S10. XRD analysis of NiMoCo before and after 48-hour HER stability test.

Table S1. The atomic ratio of Ni, Mo, Co and O elements on the surface of NiMoCo obtained from EDS.

Catalyst	Atomic %			
NiMoCo	Ni	Mo	Co	O
	34.43	6.86	10.93	47.78

Table S2. Comparison between this work and the recently reported performance of similar catalysts in alkaline electrolyte.

Electrocatalysts	Electrolyte	η_{10} (mV)	Ref.
(Co-NiMo)OH_x/NMF	1 M KOH	40	This work
NiMo/$NiCo_2O_4$	1 M KOH	44	(1)
NiMo@NF-x	1 M KOH	53	(2)
NiMoO/Ni_4Mo@NC_4	1 M KOH	61	(3)
Mo/NiMo/NF	1 M KOH	71	(4)
NiMo/Co-NW/CP	1 M KOH	85	(5)
H-Mo_2C@Co	1 M KOH	103	(6)
NiCo-MOF	1 M KOH	125	(7)
NiMo/$Ni(OH)_2$/CC	1 M KOH	132	(8)

Table S3. The EIS fit values of catalysts for HER.

Sample	R_s (Ω)	R_{ct} (Ω)
NiMoCo	2.47	5.75
NiMo	2.73	6.58
NiMoCo-SO_4	2.11	11.19
NiMoCo-NO_3	2.01	13.23
NMF	2.56	14.70

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