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Supporting Information

Ultrathin Amorphous Iron-doped Cobalt-Molybdenum Hydroxide Nanosheets for Advanced Oxygen Evolution Reaction

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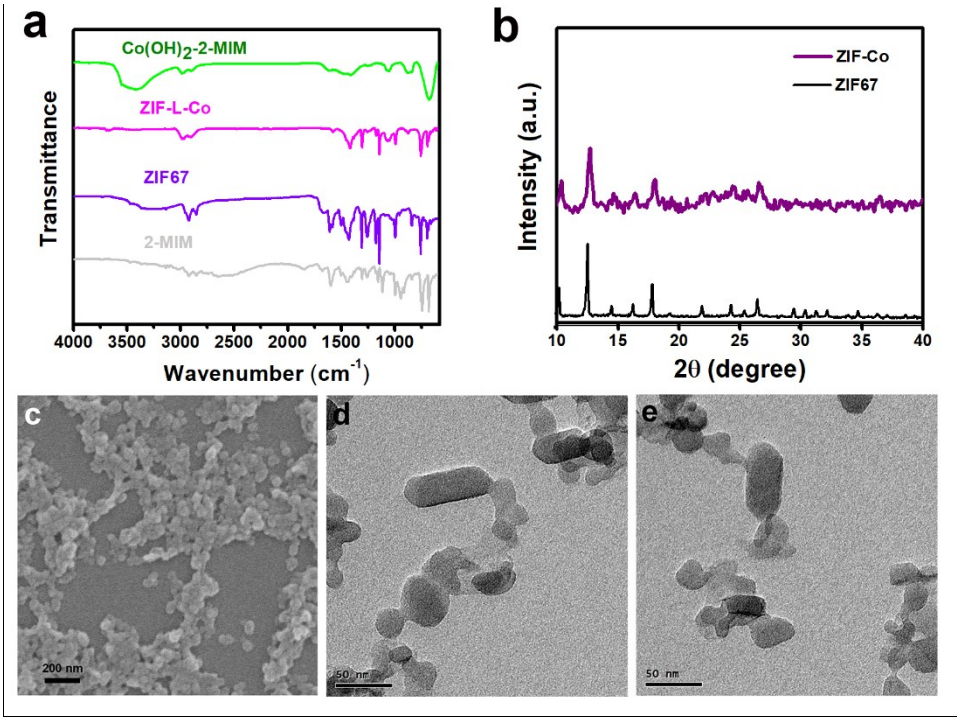

Figure S1. (a) FT-IR spectra of Co UH, ZIF-L-Co, ZIF67 and 2-MIM, (b) XRD pattern of ZIF-L-Co and ZIF67, (c) SEM and (d, e) TEM images of ZIF-L-Co.

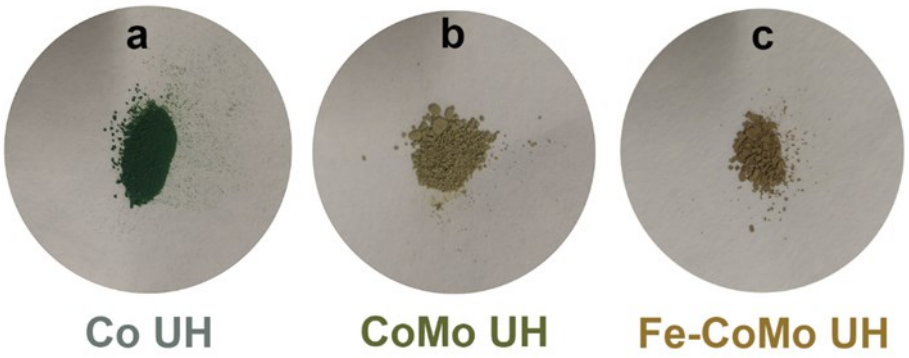

Figure S2. Photographs of (a) Co UH, (b) CoMo UH, and (c) Fe-CoMo UH powders.

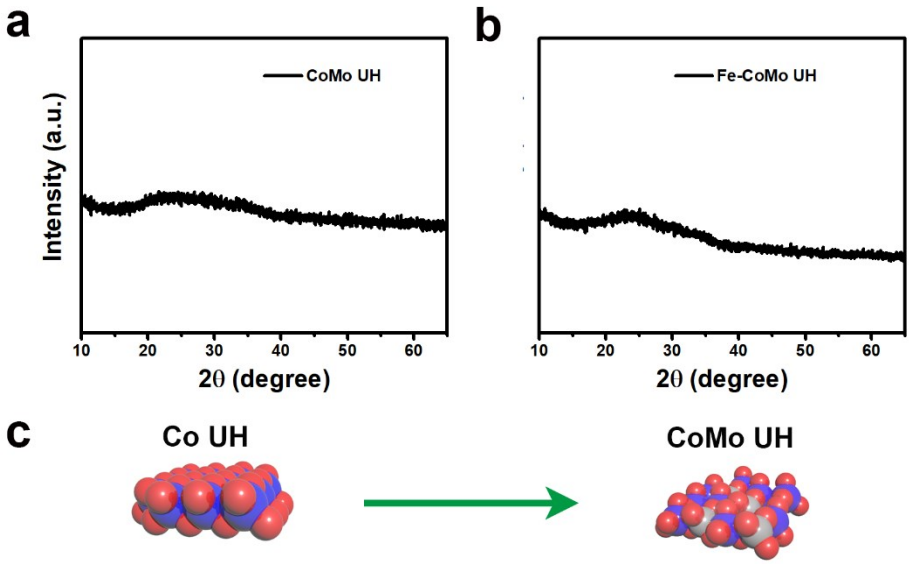

Figure S3. XRD pattern of (a) CoMo UH nanosheets and (b) Fe-CoMo UH nanosheets. (c) The schematic illustration of the structure of Co UH and CoMo UH nanosheets. Red, blue, and grey atoms are O, Co and Mo atoms, respectively.

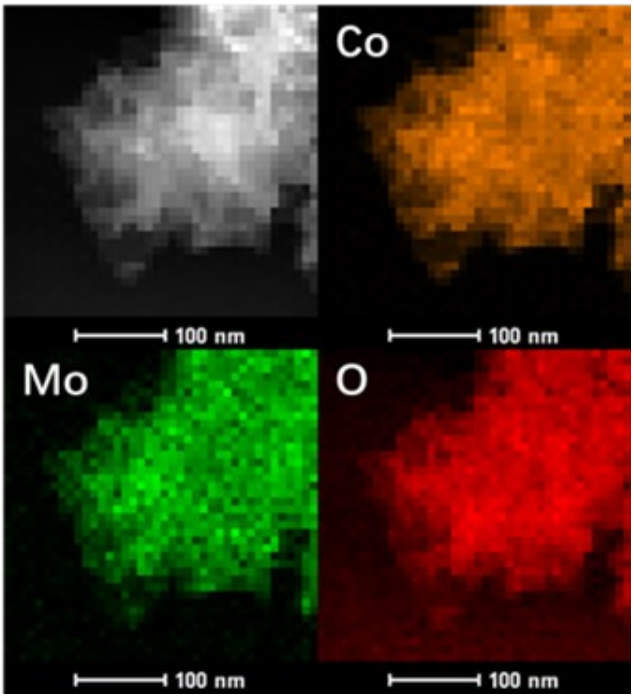

Figure S4. Element mapping images of CoMo UH nanosheets of Co, Mo, O.

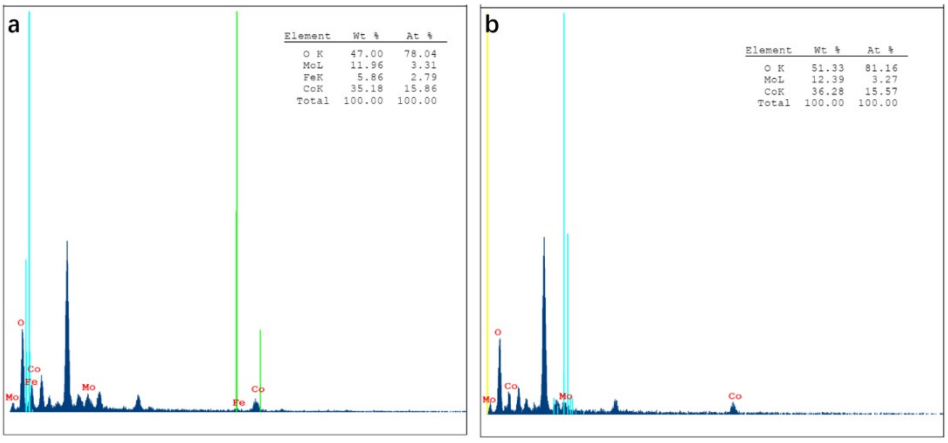

Figure S5. (a, b) EDS spectrum of Fe-CoMo nanosheets and CoMo UH nanosheets.

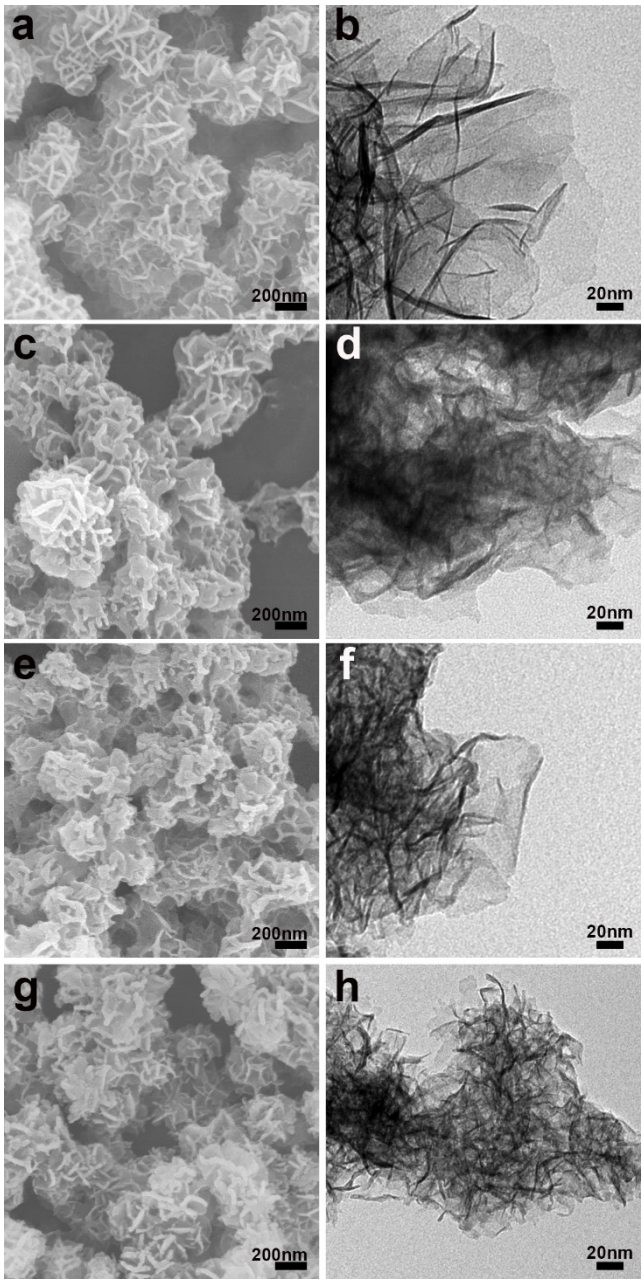

Figure S6. SEM and TEM images of CoMo1 (a, b), CoMo3 (c, d), CoMo4 (e, f), CoMo5 (g, h).

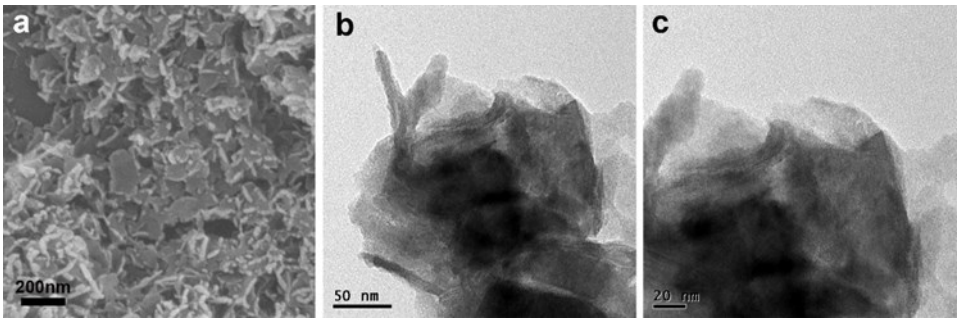

Figure S7. (a) SEM and (b, c) TEM images of Fe-Co UH.

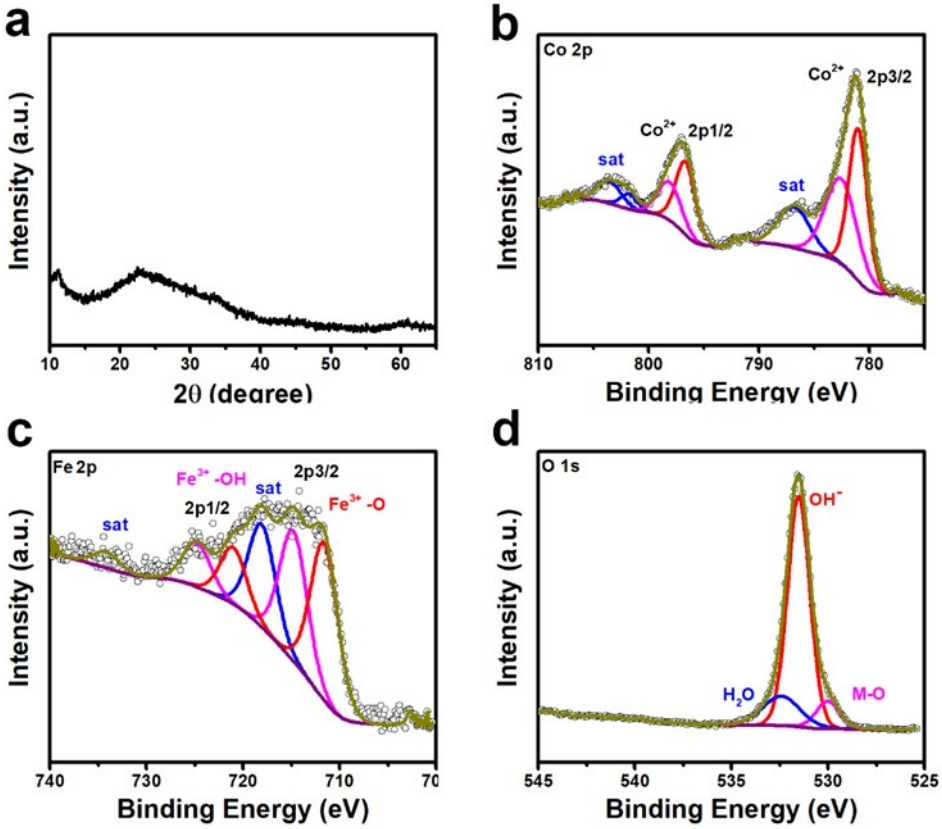

Figure S8. (a) XRD pattern and (b-d) XPS spectra of Fe-Co UH.

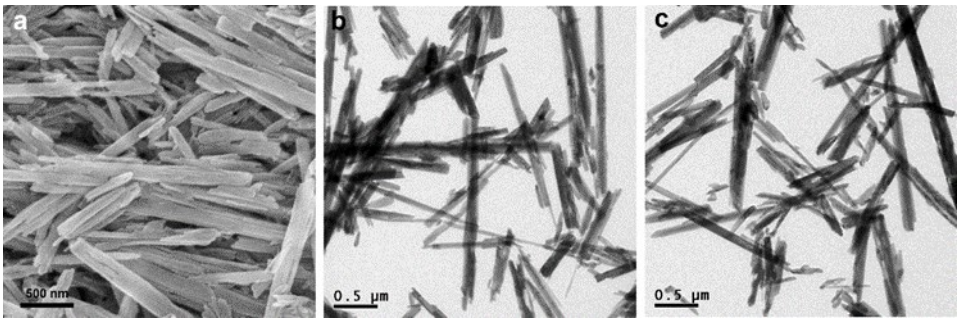

Figure S9. (a) SEM and (b, c) TEM images of $CoMoO_4$.

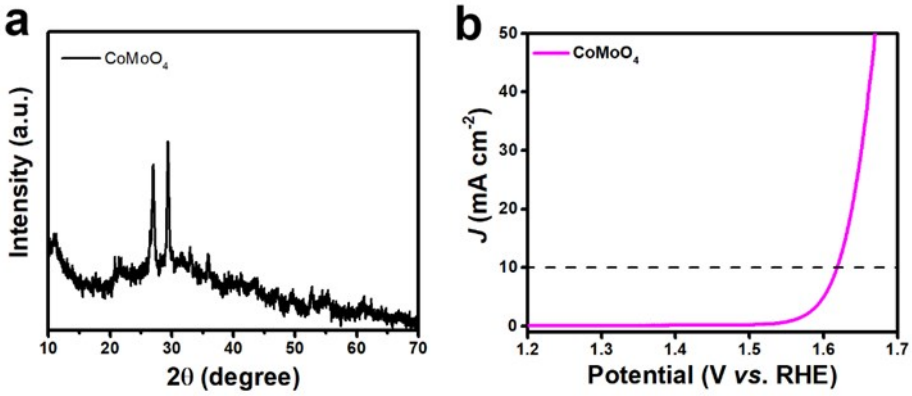

Figure S10. (a) XRD pattern and (b) polarization curve for OER of $CoMoO_4$.

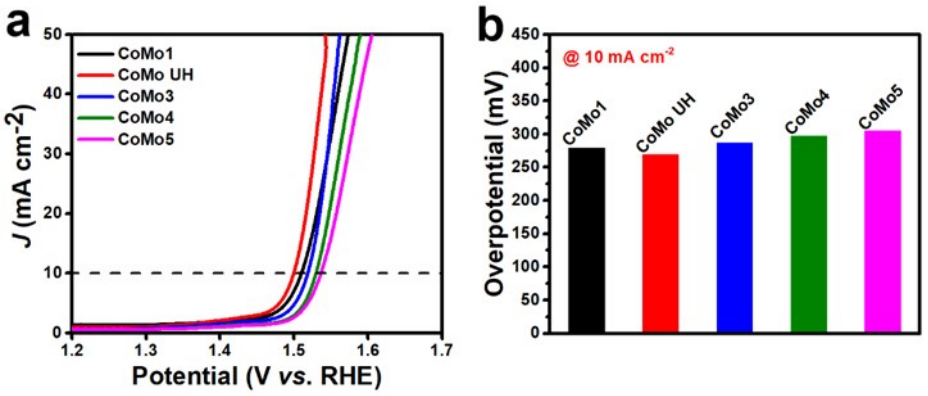

Figure S11. (a) Polarization curve for OER of CoMo1, CoMo UH, CoMo3, CoMo4, CoMo5 and (b) their overpotential comparison at 10 mA cm^{-2}.

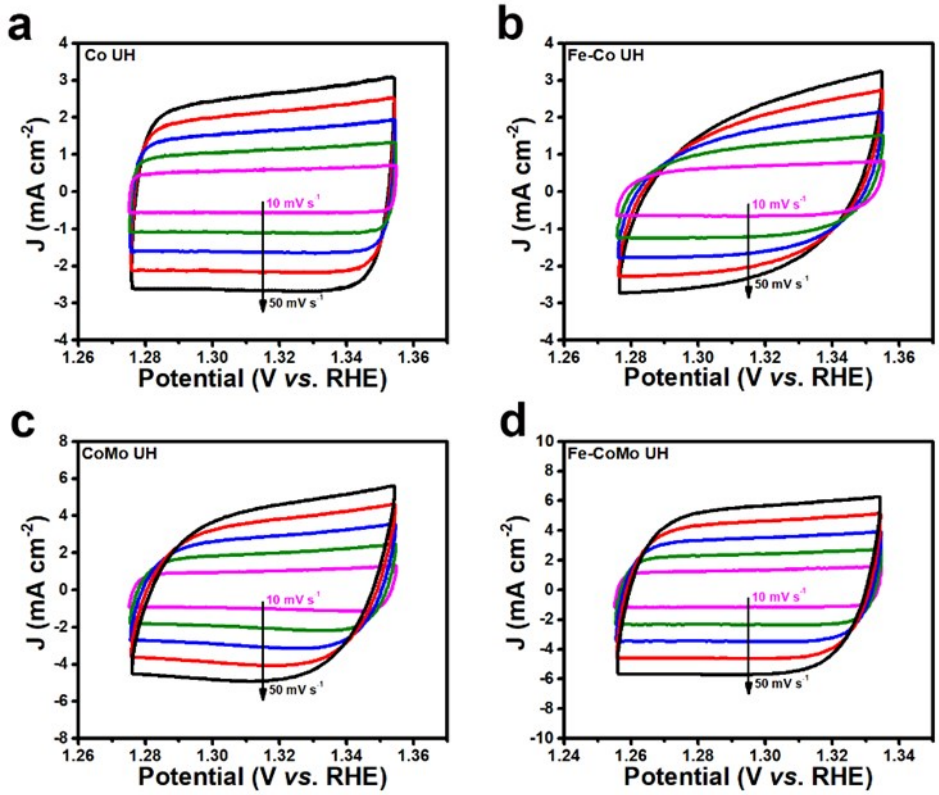

Figure S12. CV curves of (a) Co UH, (b) Fe-Co UH, (c) CoMo UH and (d) Fe-CoMo UH nanosheets with different scan rates from 10 to 50 mV s^{-1}.

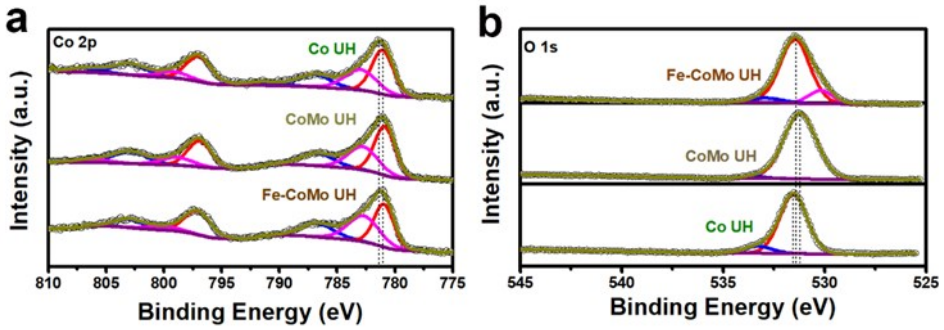

Figure S13. (a) Co 2p XPS and (b) O 1s XPS comparison between Fe-CoMo UH and CoMo UH and Co UH nanosheets.

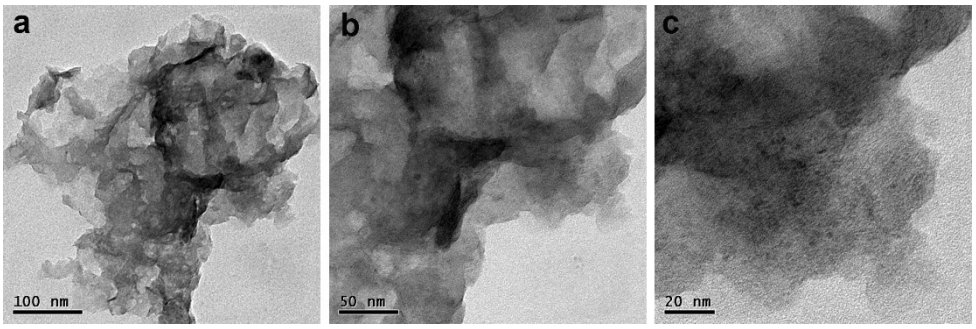

Figure S14. TEM images of Fe-CoMo UH nanosheets after long-time chronopotentiometry.

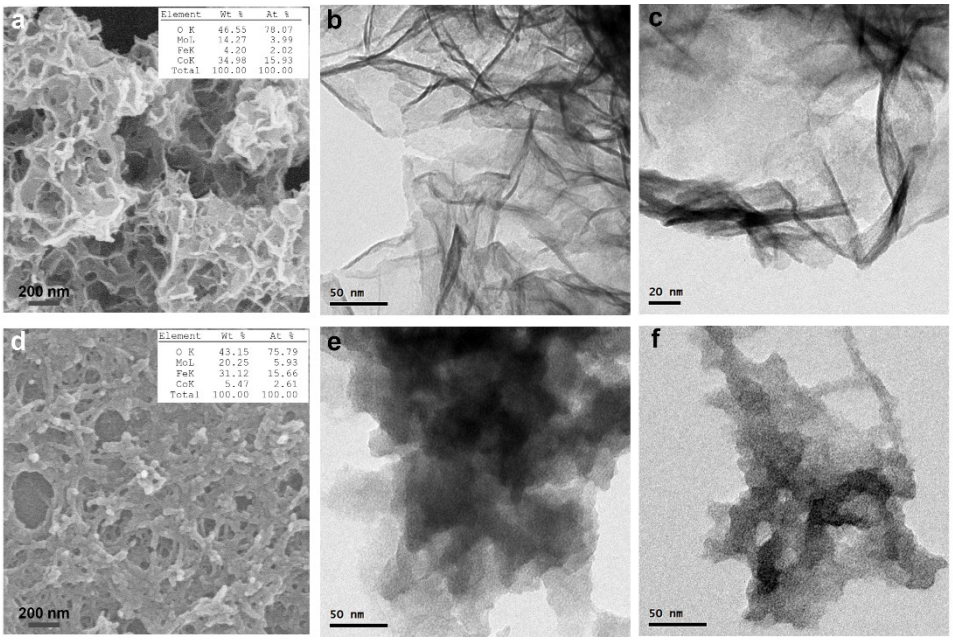

Figure S15. SEM and TEM images of Fe-CoMo1 (a-c) and Fe-CoMo3 (d-f). The inset in (a) and (d)shows the EDS of Fe-CoMo1 and Fe-CoMo3 in solution

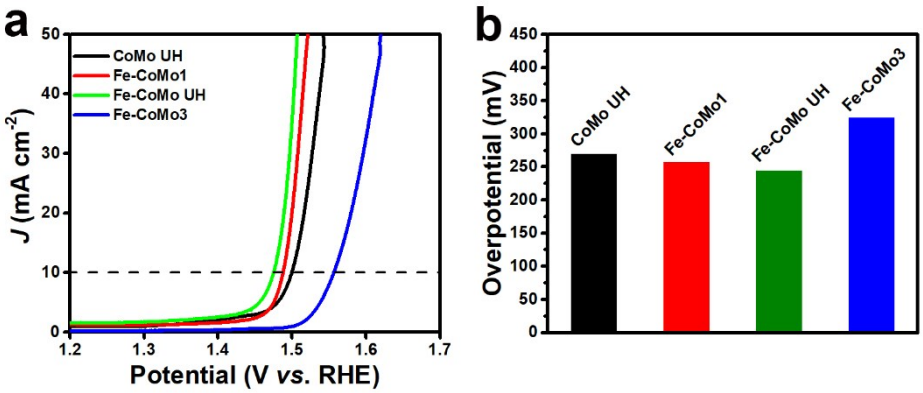

Figure S16. (a) Polarization curve for OER of CoMo UH, Fe-CoMo1, Fe-CoMo UH, Fe-CoMo3 and (b) their overpotential comparison at 10 mA cm^{-2}.

Table S1 Atomic ratio of Co/Mo/Fe from ICP-AES analysis on Fe-CoMo nanosheets and CoMo UH nanosheets.

The element in Fe-CoMo UH	**Co**	**Mo**	**Fe**
Atomic ratio (%)	70.56	18.72	10.71
The element in Fe-CoMo UH	**Co**	**Mo**	
Atomic ratio (%)	82.37	17.63	

Table S2 Atomic ratio of Co/Mo from ICP-AES analysis on amorphous CoMo samples with different ratios of Co/Mo.

Samples	**Co (at%)**	**Mo (at%)**
CoMo1	91.64	8.36
CoMo2 (CoMo UH Nanosheets)	82.37	17.63
CoMo3	74.61	25.39
CoMo4	72.11	27.89
CoMo5	68.58	31.42

Table S3. Comparison of the OER performance of Fe-CoMo UH nanosheets with previously reported OER electrocatalysts

Catalyst	**η(10 mA cm^{-2}) (mV)**	**Tafel slope ($mV\ dec^{-1}$)**	**Electrolyte**	**Reference**
Fe-CoMo UH	**245**	**37**	**1.0 M KOH**	**This work**
AH-Co	280	40	1.0 M KOH	[1]
$CoOOH/Co_xV_{1-X}$	282	56	1.0 M KOH	[2]
Ag-doped CoOOH	340	65	1.0 M KOH	[3]
Fe-Co-O NSs	260	53	1.0 M KOH	[4]
$FeCo_{0.5}Ni_{0.5}$-LDH	248	38	1.0 M KOH	[5]
Cr-CoFe LDHs/NF	238	107	1.0 M KOH	[6]
Mn_2O_3:2.64%Mo	570	75	1.0 M KOH	[7]
Meso-Fe-$MoS_2/CoMo_2S_4$	290	65	1.0 M KOH	[8]
Fe-CoO_xVo-sS	260	21	1.0 M KOH	[9]
NiFe-NS	300	40	1.0 M KOH	[10]
CoCrRu LDSs	290	56	0.1 M KOH	[11]
$Co(OH)_2$@NCNTs@NF	270	72	1.0 M KOH	[12]

Reference

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