


Supplementary information

ZIF template-based Fe doping induced defect generation in $\text{Co}_3\text{S}_4/\text{MoS}_2$ as a bifunctional electrocatalyst for Overall water splitting

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Preparation of RuO_2 and Pt/C catalysts on cobalt foam

RuO₂ and Pt/C loaded on Co foam electrodes were prepared using the procedures as follows: 8 mg RuO₂ or Pt/C and 30 μL 5 wt% Nafion solution were dispersed in 0.9 mL water/ethanol (V:V= 1:1) solution to afford an uniformly slurry with intense sonication for 4 h. Then the ink suspension was loaded on the surface of the bare Co foam (2 cm × 3 cm, mass loading of 0.48 mg cm⁻²). Finally, Pt/C and RuO₂ loaded on Co foam electrodes was dried at 70 °C for 12 h in an oven.

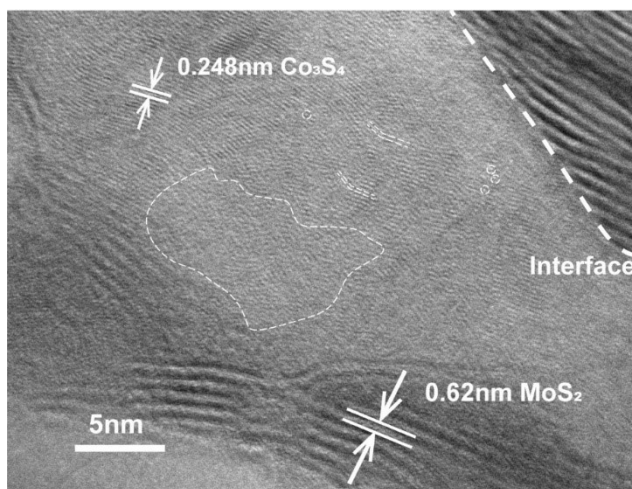


Figure S1. HRTEM image showing the defects (marked by the dashed lines) in Fe-Co₃S₄/MoS₂/CF

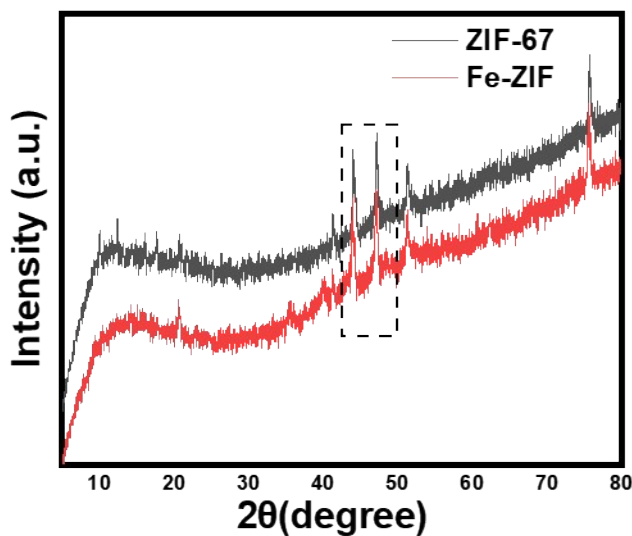


Figure S2. XRD patterns of the ZIF-67 before and after Fe-doping

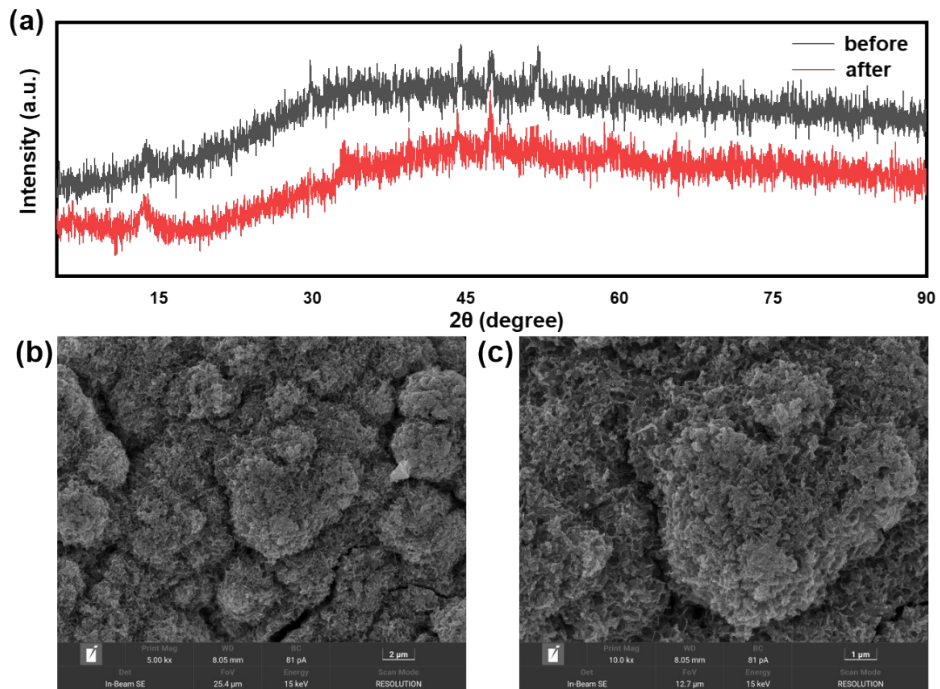


Figure S3. In the two-electrode electrolysis cell, (a) XRD curves of samples before and after 36 h stability test; (b, c) SEM images of samples after 36 h stability test

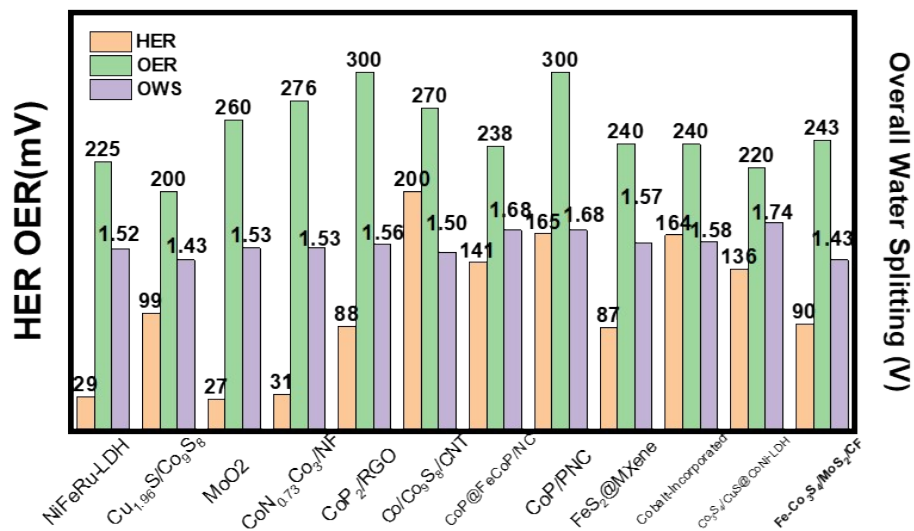


Figure S4. Comparison of the performance of Fe-Co₃S₄/MoS₂/CF with that of other catalysts for water splitting

Table S1. Comparison of the performance of Fe-Co₃S₄/MoS₂/CF with that of other catalysts for water splitting

Material	Electrolyte solution	Reaction/J (mA cm ⁻²)	Potential	Ref
NiFeRu-LDH	1 M KOH	HER/10; OER/10; OWS/10	29mV;225mV;1.52V	1
Cu _{1.96} S/Co ₉ S ₈	1 M KOH	HER/10; OER/10; OWS/10	99mV;200mV;1.43V	2
MoO ₂ Nanosheets	1 M KOH	HER/10; OER/10; OWS/10	27mV;260mV;1.53V	3
Co/CoFeNC@N-CNF	1 M KOH	HER/10; OER/10;	155mV;320mV	4
Mo-doped NiSe ₂ -CoSe ₂	1 M KOH	HER/10; OER/100;	57mV;270mV	5
CoP-NiCoP-Ti ₃ C ₂ Tx	1 M KOH	HER/10; OER/50; OWS/10	46mV;281mV;1.54V	6
N-WC nanoarray	0.5 M H ₂ SO ₄	HER/10; OER/60; OWS/30	113mV;470mV;1.7V	7
Ni-MoN-450	1 M KOH	HER/10; OER/10; OWS/100	22mV;270mV;1.52V	8
CoS _x /Ni ₃ S ₂ @NF	1 M KOH	HER/10; OER/20; OWS/10	204mV;280mV;1.57V	9
P-Co ₃ O ₄	1 M KOH	HER/10; OER/10; OWS/50	120mV;280mV;1.76V	10
CoN _{0.73} Co ₃ / NF	1 M KOH	HER/10; OER/10; OWS/10	31mV;276mV;1.53V	11
CoP ₂ /RGO	1 M KOH	HER/10; OER/10; OWS/10	88mV;300mV;1.56V	12
Co/Co ₉ S ₈ /CNT	1 M KOH	HER/10; OER/10; OWS/10	200mV;270mV;1.50V	13
CoP@FeCoP/NC	1 M KOH	HER/10; OER/10; OWS/10	141mV;238mV;1.68V	14
CoP/PNC	1 M KOH	HER/10; OER/10; OWS/10	165mV;300mV;1.68V	15
NiTe-HfTe ₂ /g-C ₃ N ₄	0.1M KOH	HER/10; OER/10; OWS/10	71mV;150mV;1.49V	16
FeS ₂ @MXene	1 M KOH	HER/10; OER/10; OWS/10	87mV;240mV;1.57V	17
Cobalt-Incorporated Copper Sulfide/NF	1 M KOH	HER/10; OER/10; OWS/10	164mV;240mV;1.58V	18
N-VG-CQDs	0.5 M H ₂ SO ₄	HER/10; OER/10	238mV;497mV	19
	1 M KOH	HER/10; OER/10	218mV;383mV	
Co ₃ S ₄ /CuS@CoNi-LDH	1 M KOH	HER/10; OER/10; OWS/10	136mV;220mV;1.74V	20
Cu _x O@NiO-MoO ₂ NRs	1 M KOH	HER/10; OER/50; OWS/10	65mV;321mV;1.54V	21
MoN/MoO ₂	1 M KOH	HER/10; OER/10; OWS/10	38mV;309mV;1.57V	22
Fe-Co₃S₄/MoS₂/CF	1M KOH	HER/10; OER/10; OWS/10	90mV;243mV;1.42V	

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