

Supporting information

Trifunctional electrocatalysts of ternary iron copper molybdenum–Schiff bases complexes
applied to Zn–air battery and alkaline water splitting

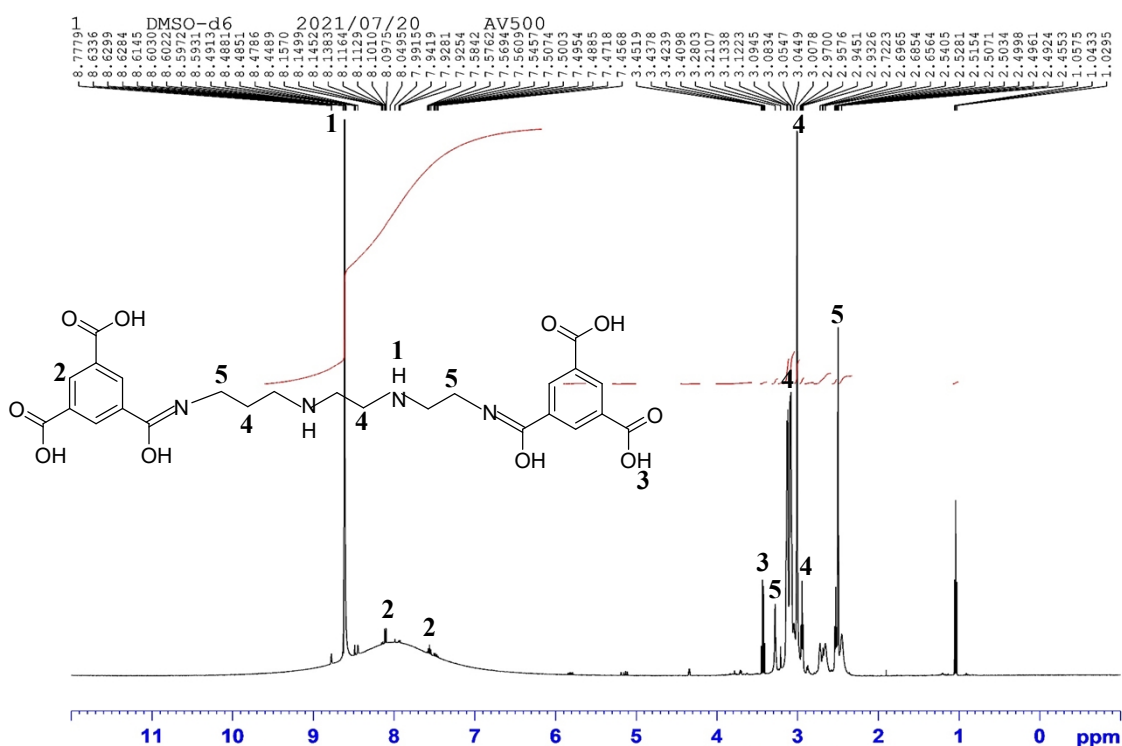
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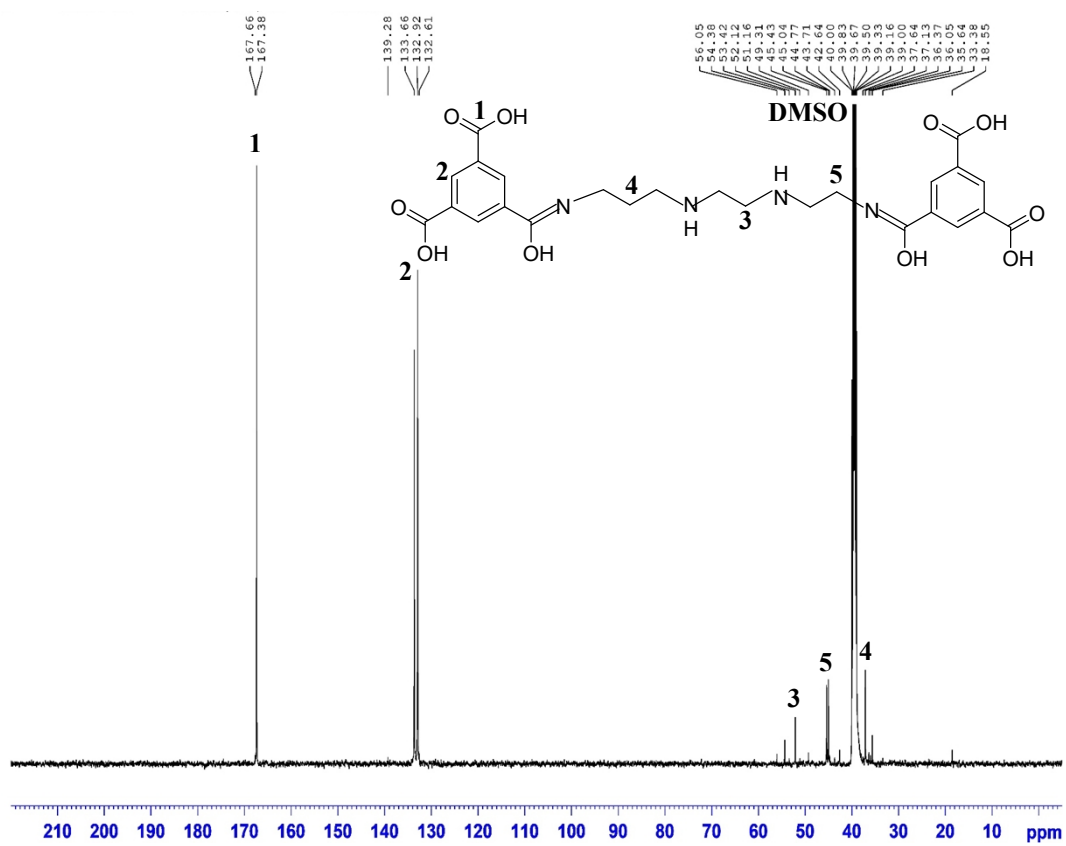


Figure S2. ^{13}C -NMR of unheated SB.

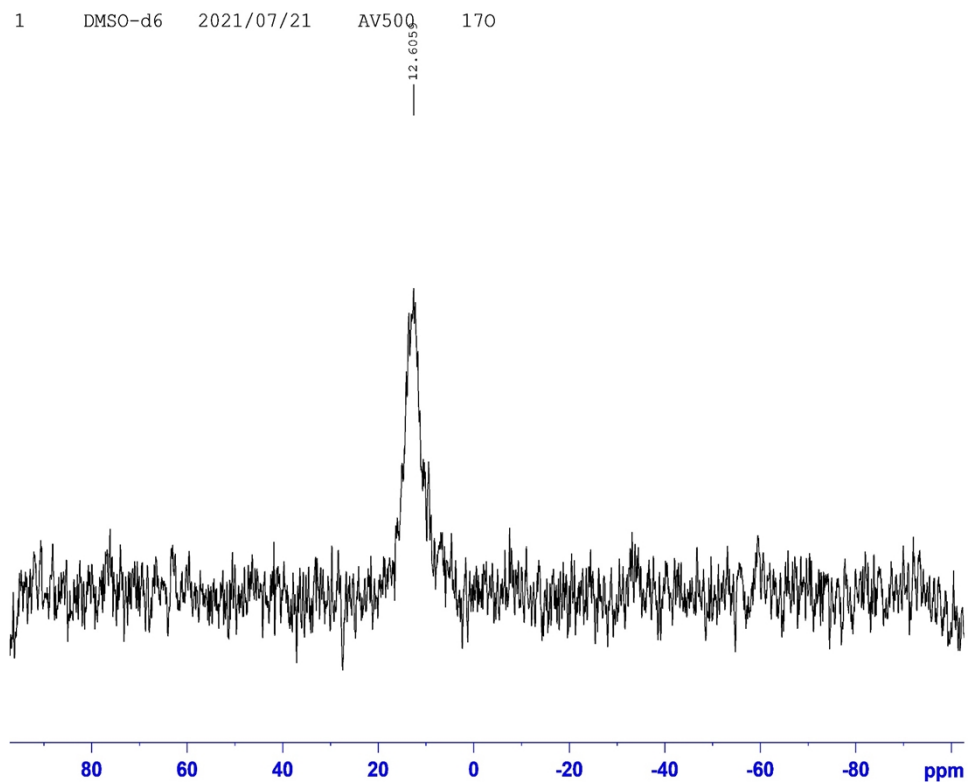


Figure S3. ^{17}O -NMR of unheated SB.

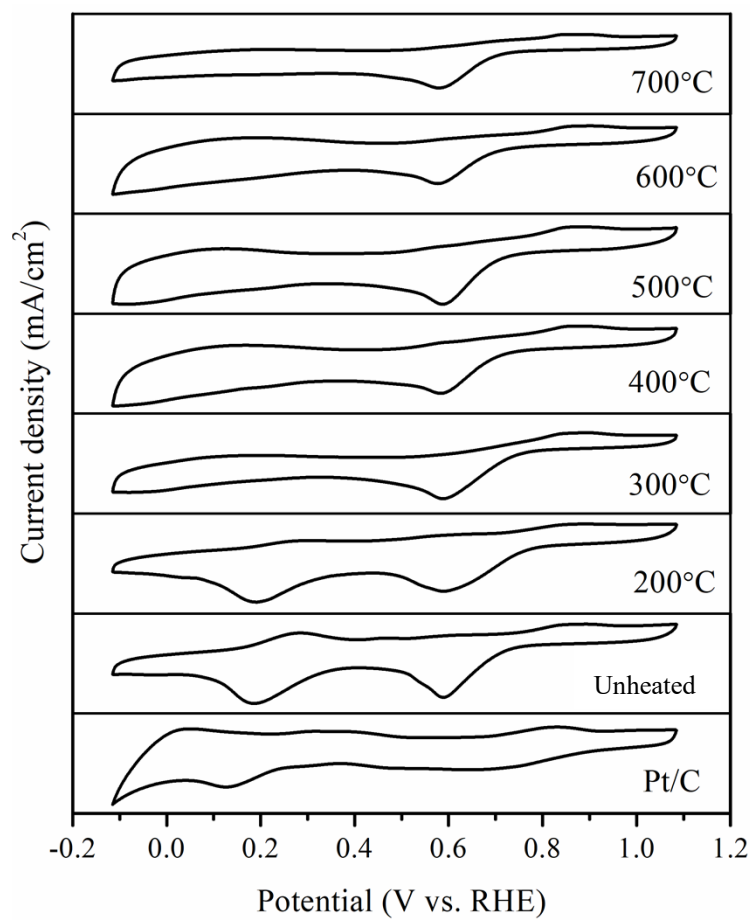


Figure S4. CV of Fe_{0.5}Cu_{0.5}Mo_{0.5}-SB under different heating temperatures.

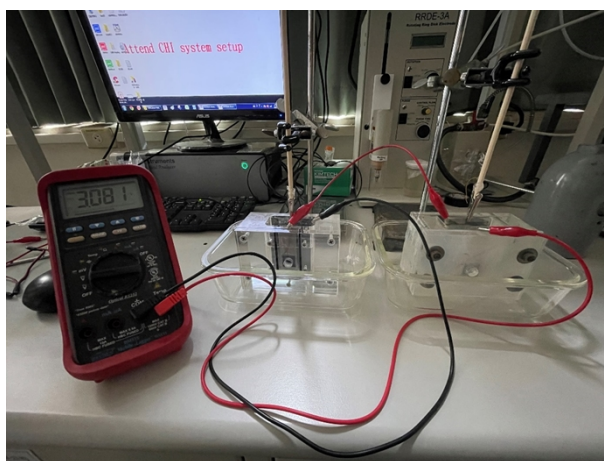
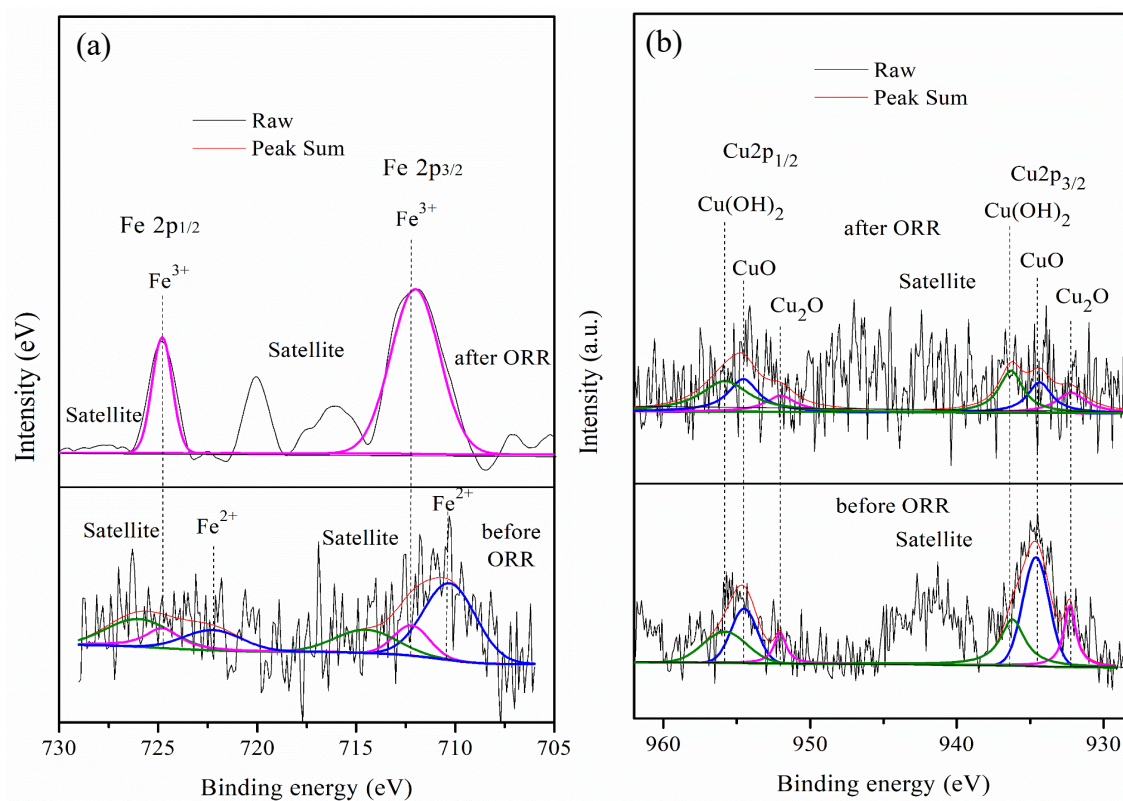


Figure S5. The assembled the two Zn-air batteries connected in series showing the voltage of 3.081 V by measured using a multimeter.

Table S1. Specific capacity and energy density of different electrocatalysts.

Electrocatalysts	Current density		Specific capacity (mAh/g)		Energy density (mWh/g)	
	5 mA/cm ²	10 mA/cm ²	5 mA/cm ²	10 mA/cm ²	5 mA/cm ²	10 mA/cm ²
Fe _{0.5} Cu _{0.5} Mo _{0.45} -SB-400/C	292.51	682.96	362.24	822.18		
Pt/C	233.75	416.11	274.04	478.27		
Pt/C + RuO ₂	222.18	420	273.99	506.54		



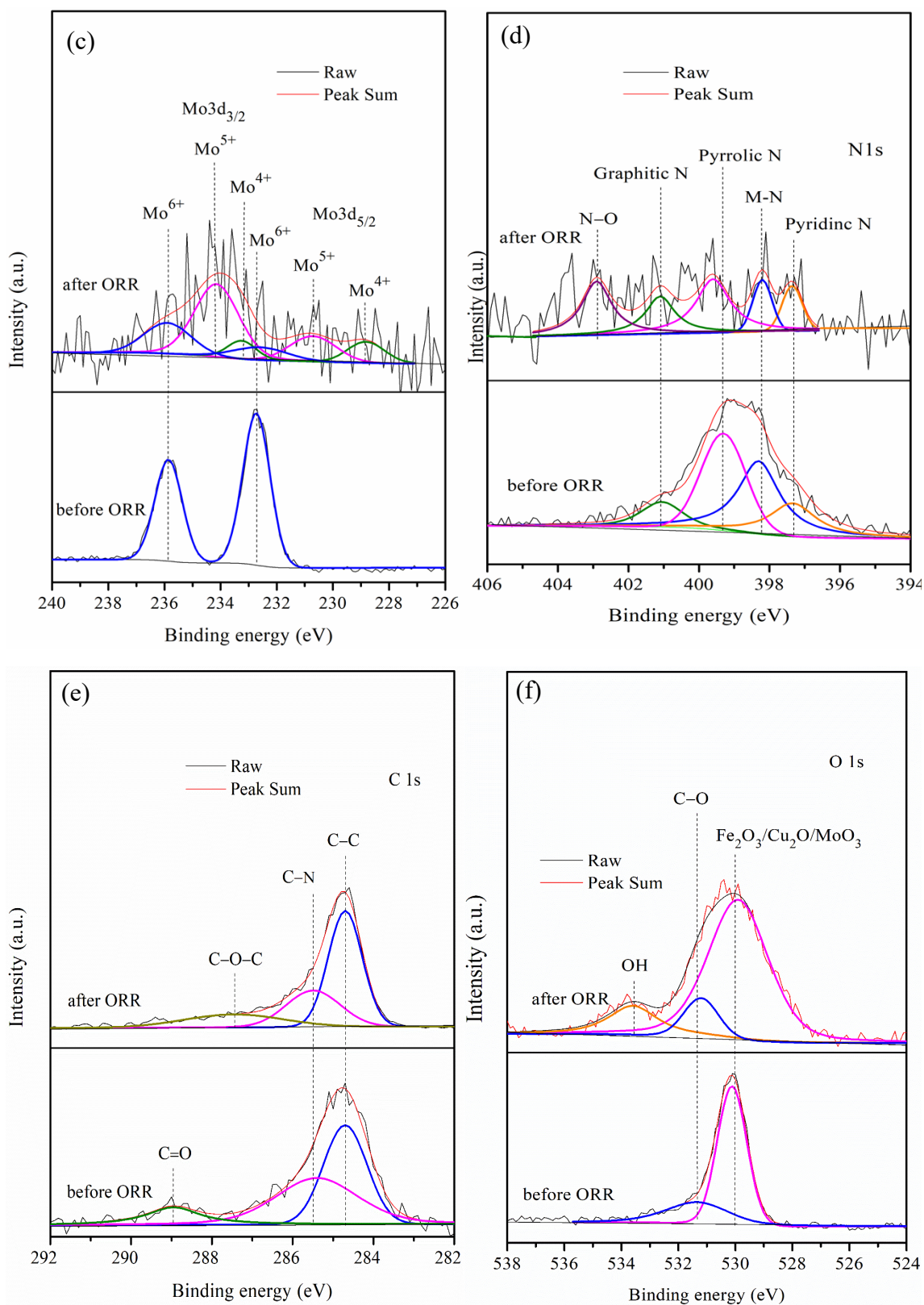
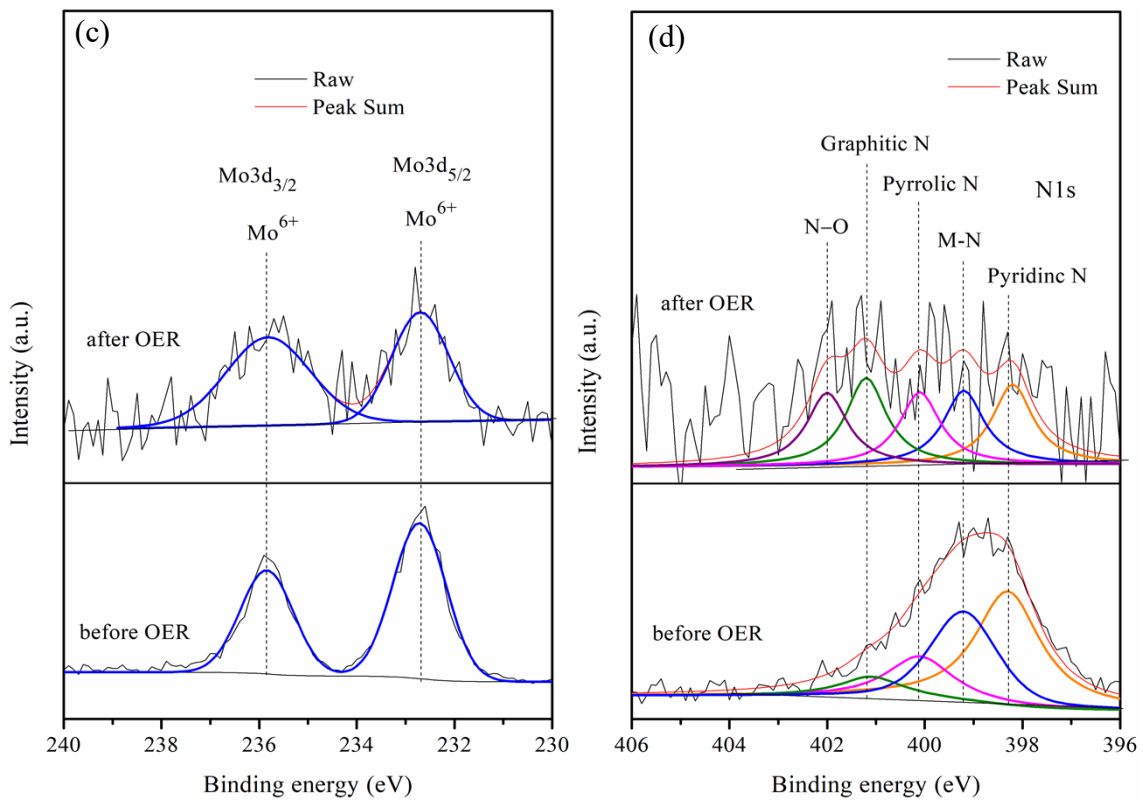
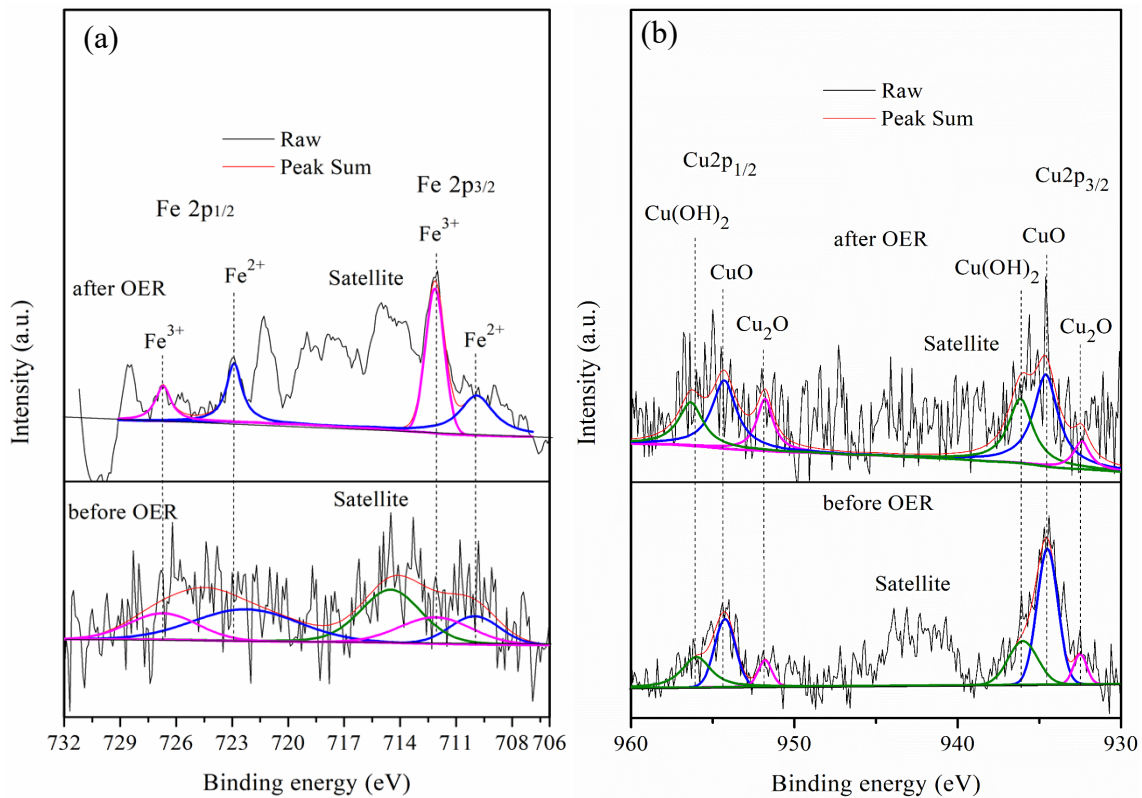


Figure S6. XPS spectra of (a) Fe 2p, (b) Cu2p, (c) Mo3d, (d) N1s (e) C1s, (f) O1s of the $\text{Fe}_{0.5}\text{Cu}_{0.5}\text{Mo}_{0.5}\text{-SB-400}$ of before and after ORR.



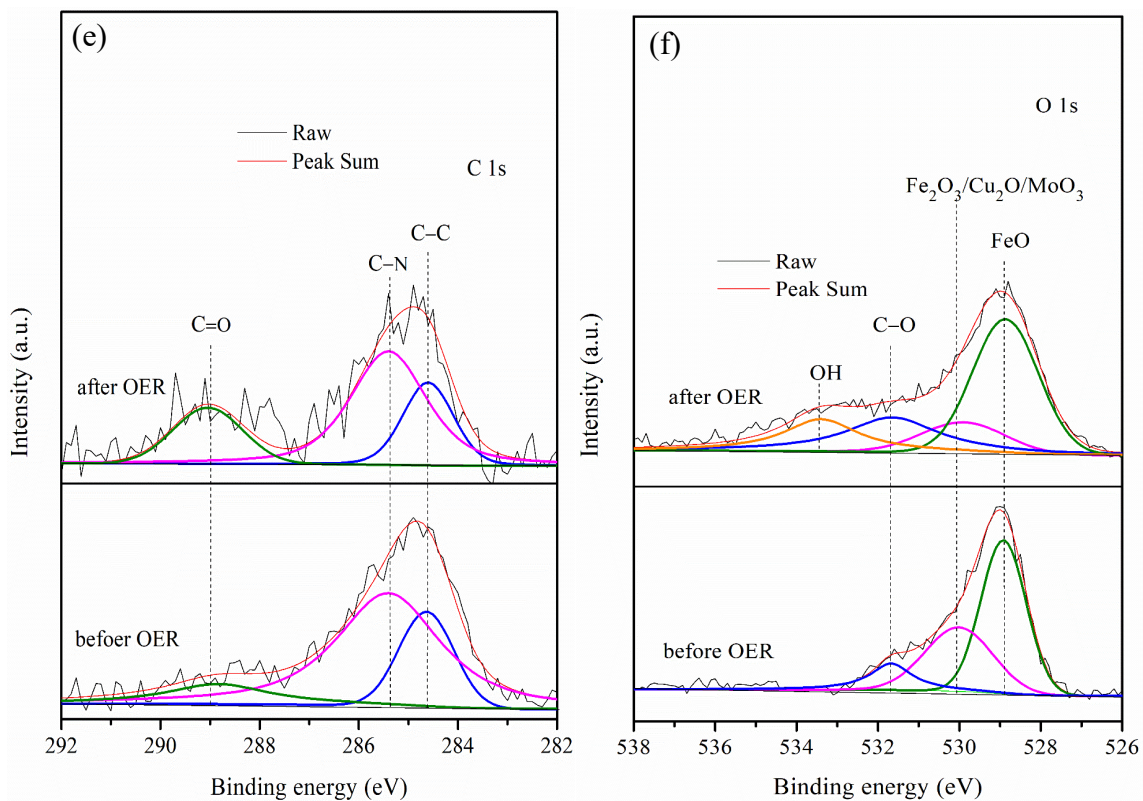
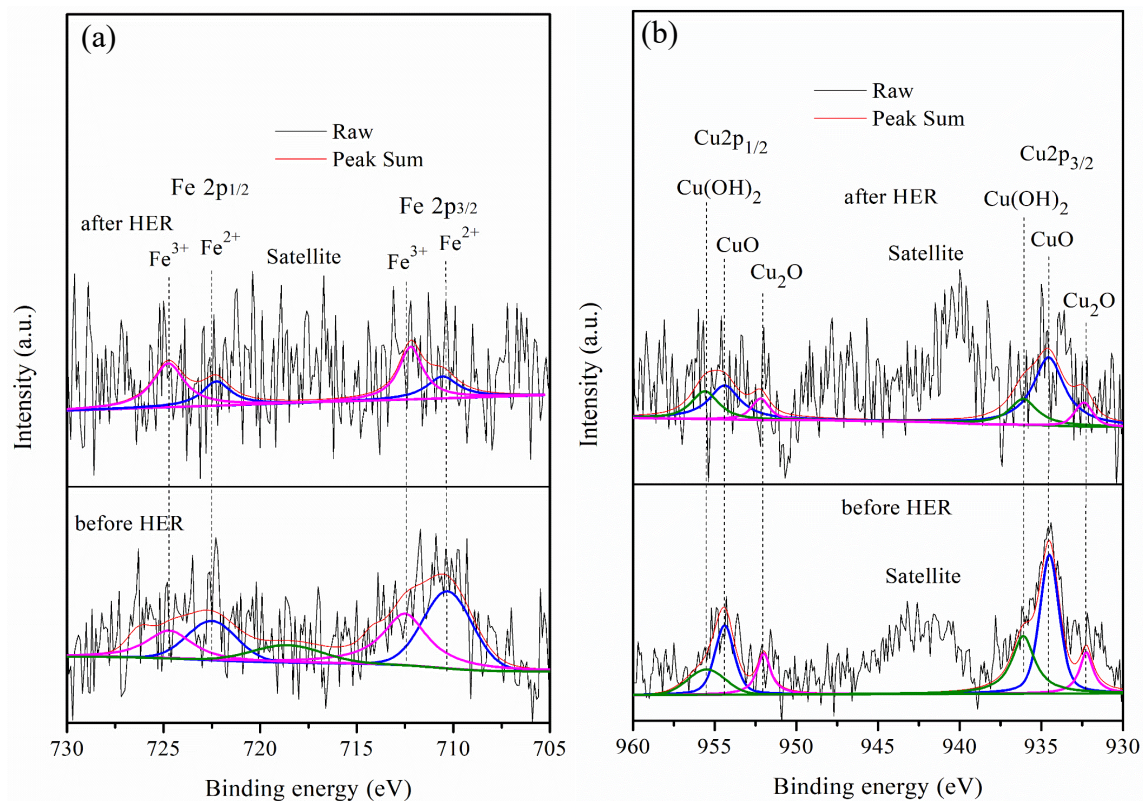


Figure S7. XPS spectra of (a) Fe 2p, (b) Cu2p, (c) Mo3d, (d) N1s, (e) C1s, (f) O1s of the $\text{Fe}_{0.5}\text{Cu}_{0.5}\text{Mo}_{0.5}\text{-SB-600}$ of before and after OER.



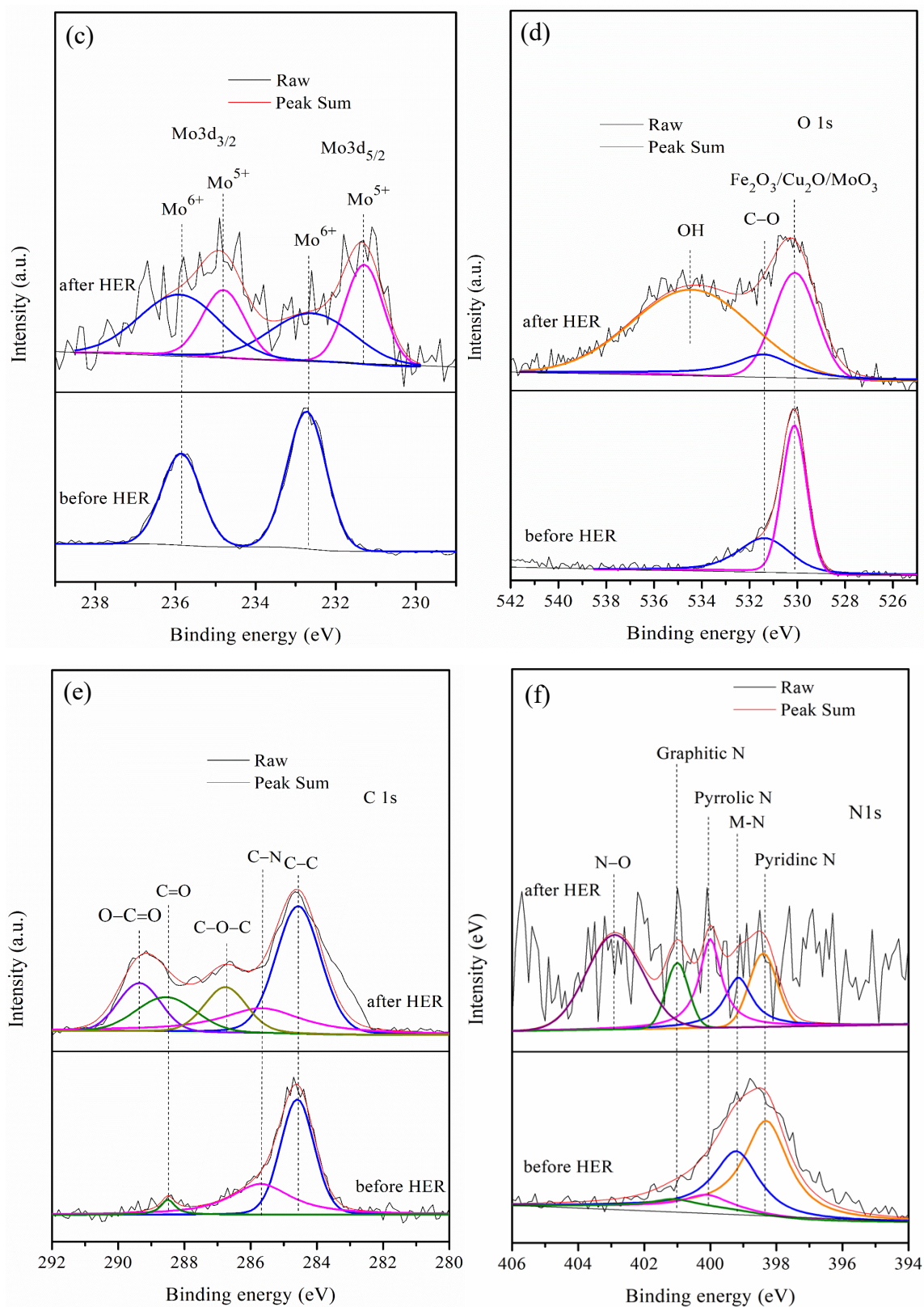


Figure S8. XPS spectra of (a) Fe 2p, (b) Cu 2p, (c) Mo 3d, (d) O 1s, (e) C 1s, (f) N 1s, on the Fe_{0.5}Cu_{0.5}Mo_{0.5}-SB-300 of before and after HER.

Table S2. The electrocatalytic performance of various electrocatalysts comparison.

Electrocatalysts	ORR η_3 (mV)	OER η_{10} (mV)	OER η_{30} (mV)	HER η_{10} (mV)	HER η_{30} (mV)	Electrolyte	Reference
Fe _{0.5} Cu _{0.5} Mo _{0.5} - SB	560	650	950	550	670	0.1 MKOH	This work
Commercial Pt/C	800			280	> 1000	0.1 MKOH	This work
Commercial RuO ₂	-	0.55	1020			0.1 MKOH	This work
NiO-NiS/N-C	-	370mV	400	-		1 MKOH	[1]
Co salen- CNTorCo salen- CNT	680	-	-	-		0.1 MKOH	[2]

[1] M. Gao, L. Yang, B. Dai, X. Guo, Z. Liu, B. Peng, *J. Solid State Electrochem.*, 2016, **20**, 2737–2747.

[2] L. Bai, M. Li, J. Guan, *ChemistrySelect*, 2018, **3**, 581 –585.