

Synergistic interaction between g-C₃N₄ and Cu-Zn-MOFs via electrostatic assembly for enhanced electrocatalytic CO₂ reduction

Xiaoqing Lu,^a Zhaolong Yue,^a Hongyu Chen,^{*b} Siyuan Liu,^a Shuxian Wei,^b Zhaojie Wang^a

^aSchool of Materials Science and Engineering, China University of Petroleum (East China), Qingdao 266580, P. R. China

^bCollege of Science, China University of Petroleum (East China), Qingdao 266580, P. R. China

Corresponding Author:

*E-mail: hychen1226@163.com

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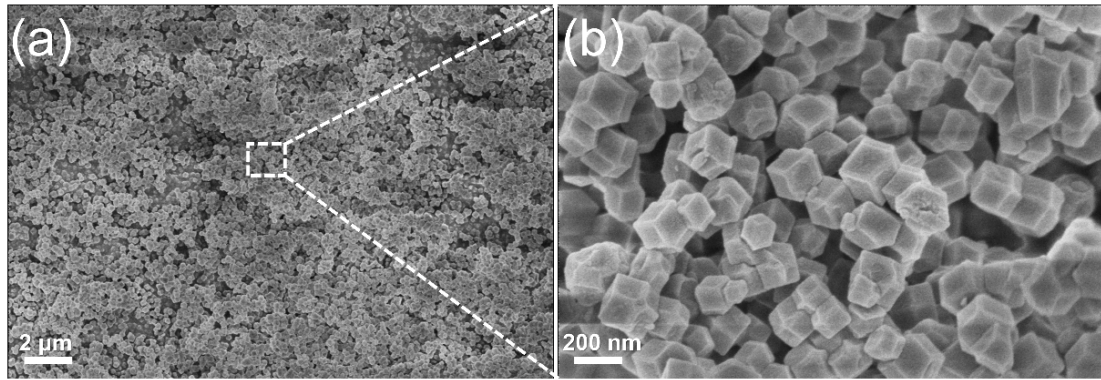


Fig. S1. SEM and corresponding high-magnification images of ZIF-8.

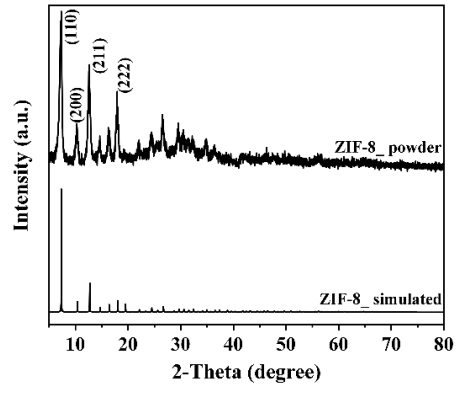


Fig. S2. XRD patterns of ZIF-8 powder and ZIF-8 simulation.

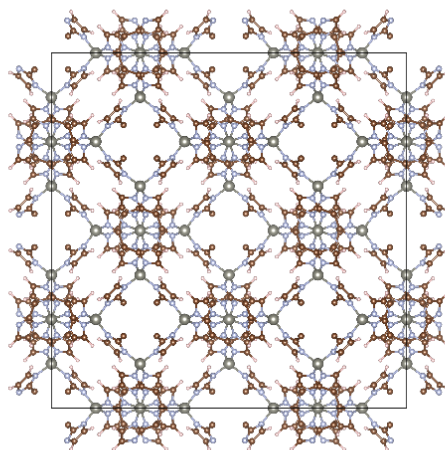


Fig. S3. The crystal pattern of simulated ZIF-8.

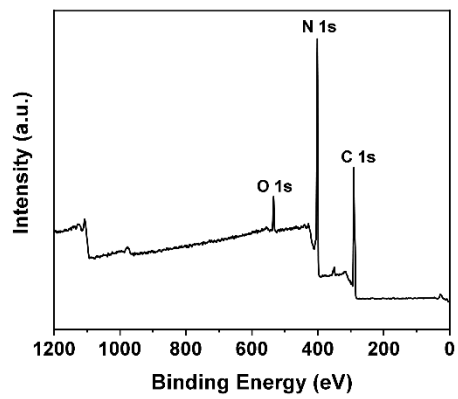


Fig. S4. XPS survey spectrum of g-C₃N₄.

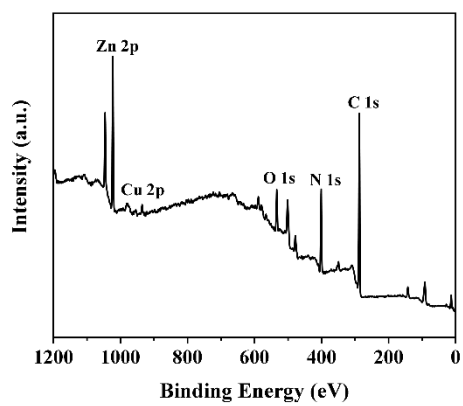


Fig. S5. XPS survey spectrum of Cu-Zn-MOFs.

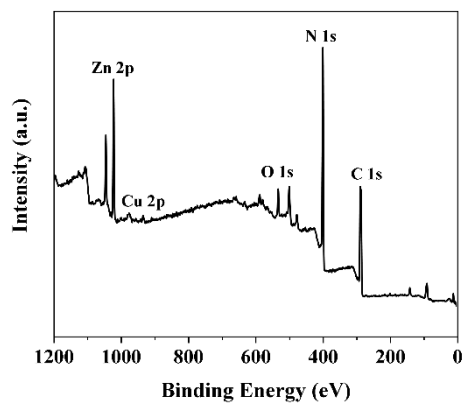


Fig. S6. XPS survey spectrum of g-C₃N₄@Cu-Zn-MOFs-1:1.

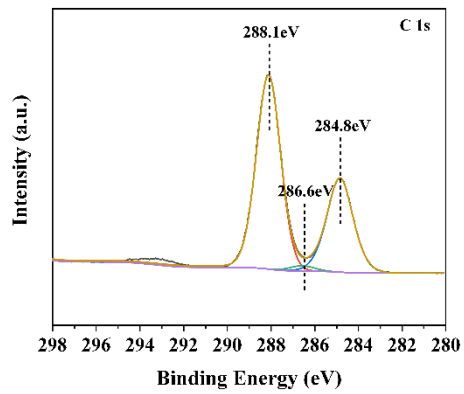


Fig. S7. XPS spectrum. C 1s of g-C₃N₄.

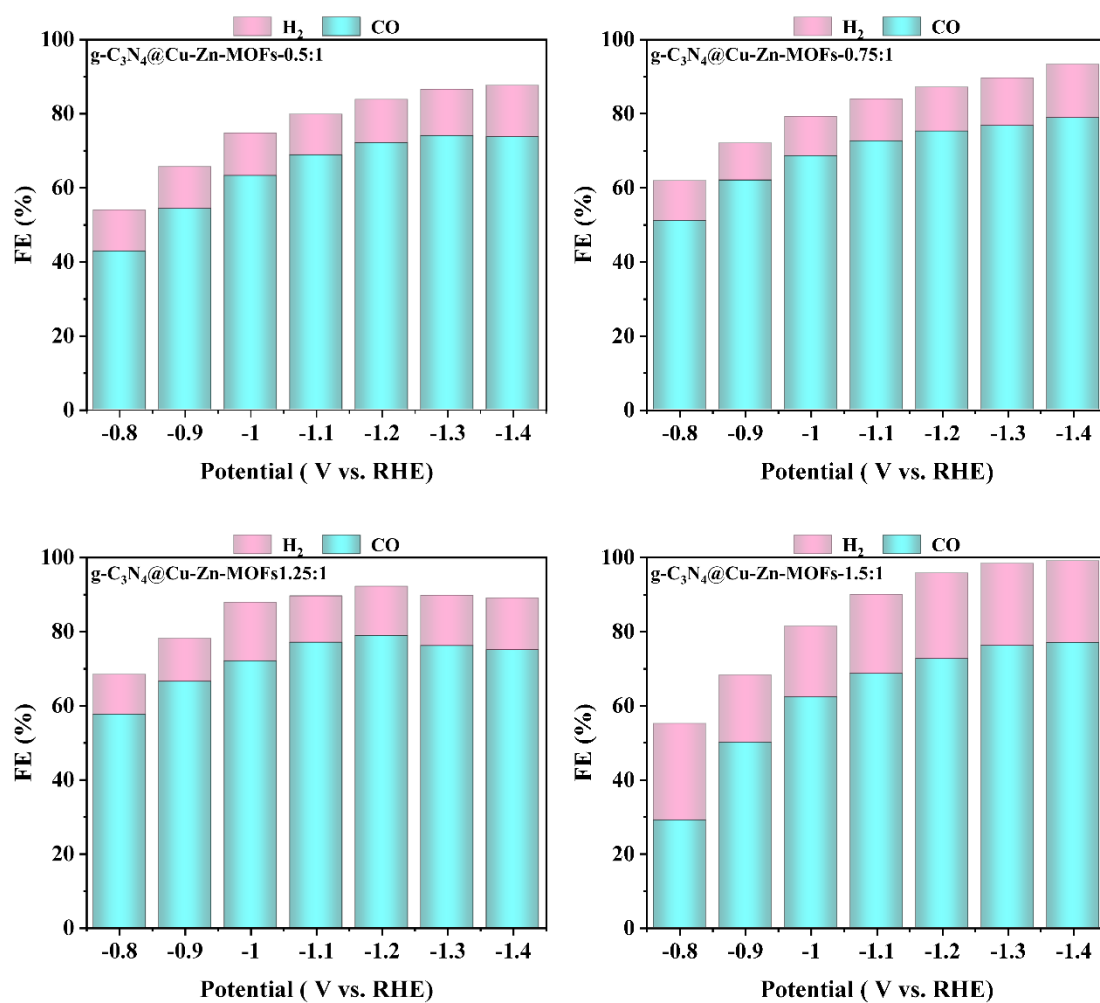


Fig. S8. Potential-dependent Faradaic efficiency of (a) g-C₃N₄@Cu-Zn-MOFs-0.5:1, (b) g-C₃N₄@Cu-Zn-MOFs-0.75:1, (c) g-C₃N₄@Cu-Zn-MOFs-1.25:1, and (d) g-C₃N₄@Cu-Zn-MOFs-1.5:1.

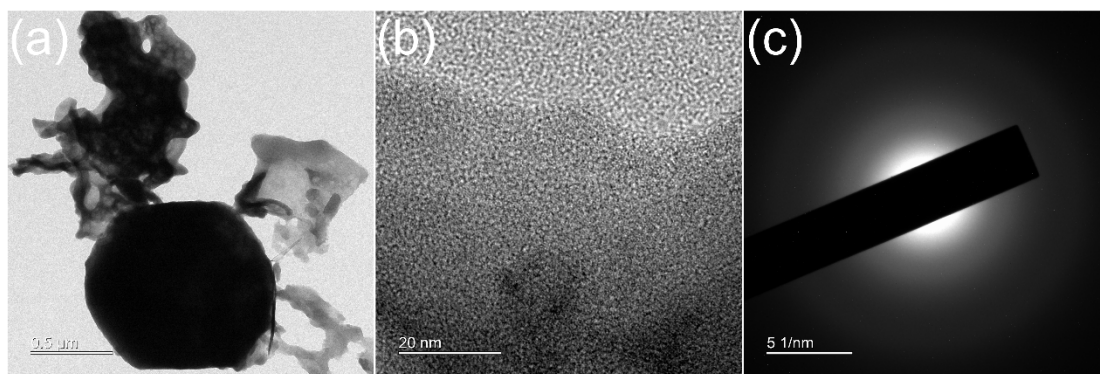


Fig. S9. (a) TEM, (b) HRTEM, and (c) SAED images of $g\text{-C}_3\text{N}_4@\text{CuZn-MOFs-1:1}$ after $e\text{CO}_2\text{R}$.

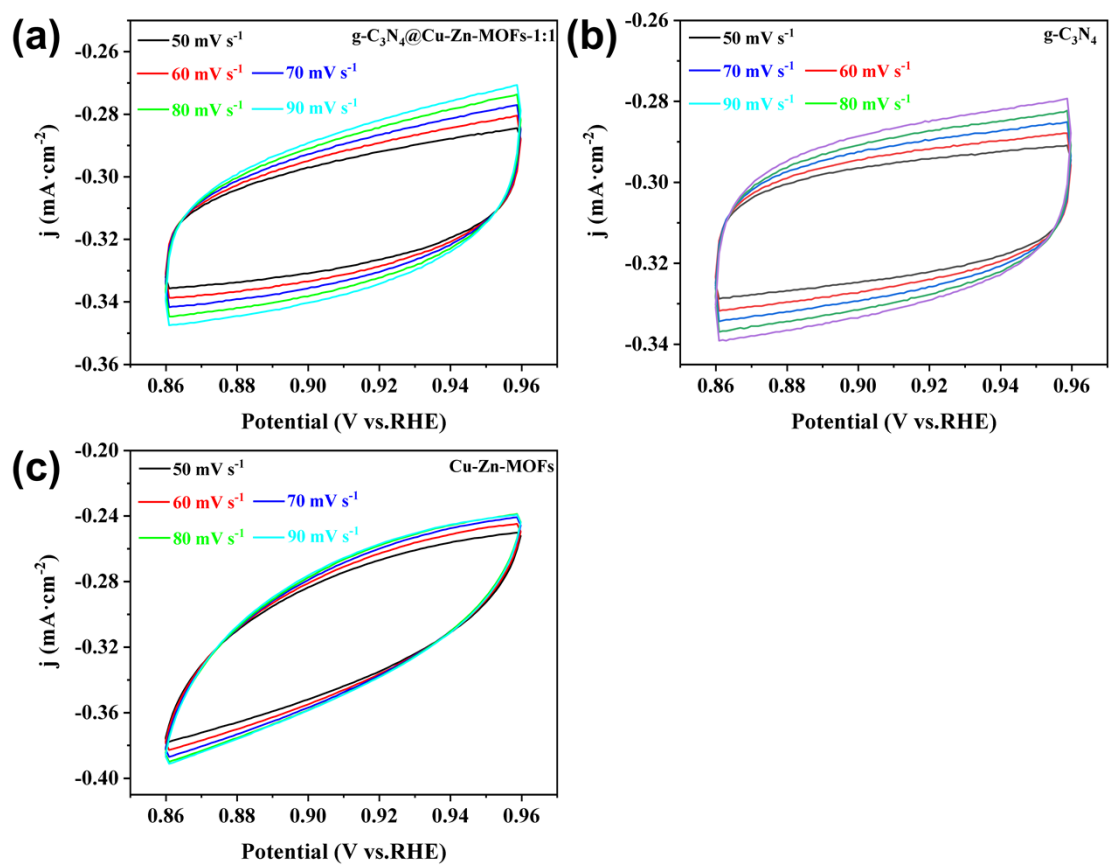


Fig. S10. Cyclic voltammograms of (a) $\text{g-C}_3\text{N}_4@\text{Cu-Zn-MOFs-1:1}$, (b) $\text{g-C}_3\text{N}_4$, and (c) Cu-Zn-MOFs at different scan rates.

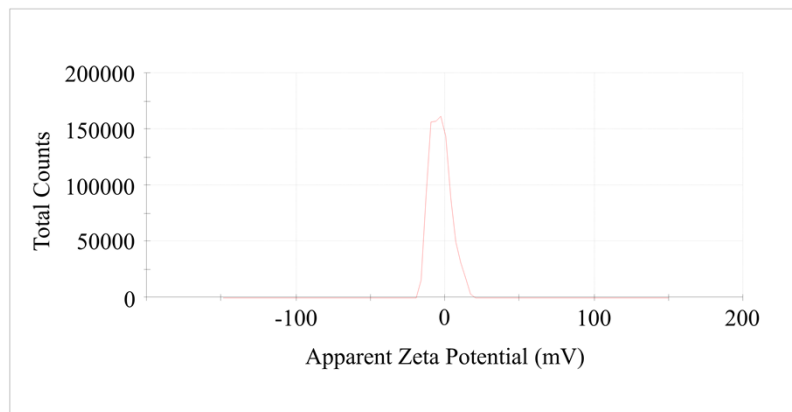


Fig. S11. Zeta potential distribution of g-C₃N₄.

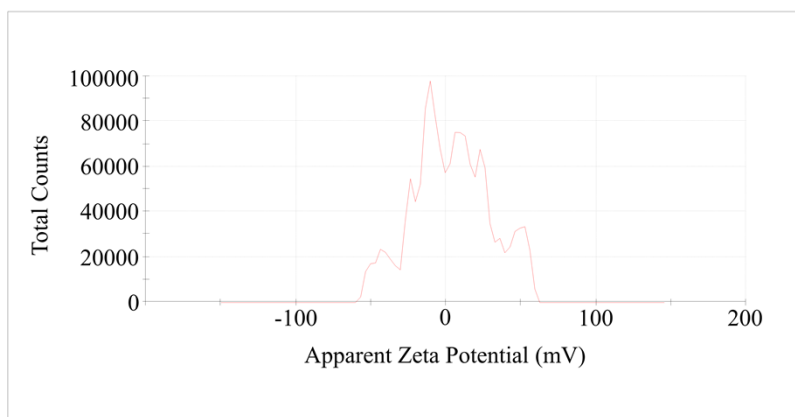


Fig. S12. Zeta potential distribution of Cu-Zn-MOFs.

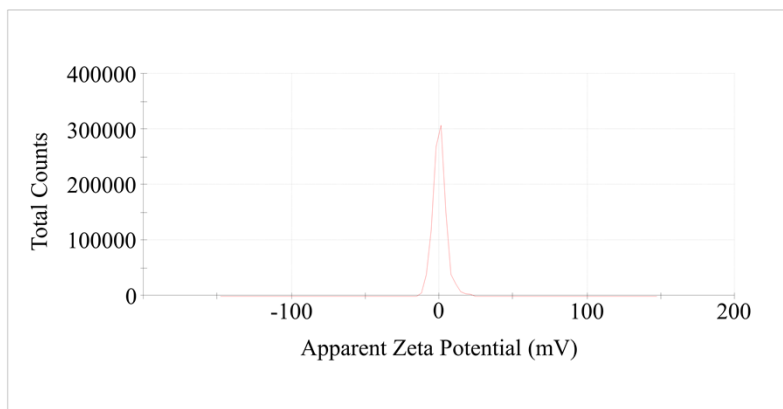


Fig. S13. Zeta potential distribution of g-C₃N₄@Cu-Zn-MOFs-1:1.

Table S1. The contents of C, N, O, Zn, and Cu in g-C₃N₄@Cu-Zn-MOFs-1:1 measured by the energy dispersive spectrometer (EDS) spectrum.

Elements	C	N	O	Zn	Cu
wt.%	64.44	21.19	7.08	6.44	0.86

Table S2. Summary of the reported NC-, g-C₃N₄-, and MOFs-based electrocatalysts for eCO₂R to CO.

Electrocatalysts	Potentials (V vs. RHE)	FE_{CO} (%)	<i>j</i>_{CO} (mA cm⁻²)	References
g-C ₃ N ₄ @Cu-Zn- MOFs-1:1	-1.3	85	21.3	This work
Fe-N ₅ /C	-0.7	67.8	3.8	[S1]
Fe NP/NC	-0.7	35.7	1.1	[S1]
g-C ₃ N ₄ /MWCNTs	-0.75	60	0.55	[S2]
CuSe/g-C ₃ N ₄	-1.2	85.2	8.5	[S3]
NRMC-900	-0.7	80	2.9	[S4]
NCNTs	-0.8	80	0.8	[S5]
NC-900	-0.95	78	0.8	[S6]
ACN-850	-1.1	80	2.4	[S7]
Ag/g-C ₃ N ₄	-0.7	94	10.1	[S8]
P-Ag/g-C ₃ N ₄	-0.9	80.9	9.8	[S8]
PcCu-O ₈ -Zn/CNT	-0.7	88	8	[S9]
Ag@Ui-66-SH	-1.1	74	19.5	[S10]
NiSA-N ₂ -C	-0.8	98	14.7	[S11]
Cu-MOFs [Cu(L)SO ₄] \cdot H ₂ O	-0.89	77.5	3	[S12]
Ag ₂ O/layered ZIF	-1.2	80.6	26.2	[S13]
Re-SURMOFs	-1.6	93	2.5	[S14]
2D Ni(Im) ₂ -5 nm	-0.9	79.3	5.2	[S15]

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