Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supplementary Information

Sacrificial agent-free photocatalytic CO_2 reduction by a 2D cobalt porphyrin-based MOF/graphene heterojunction

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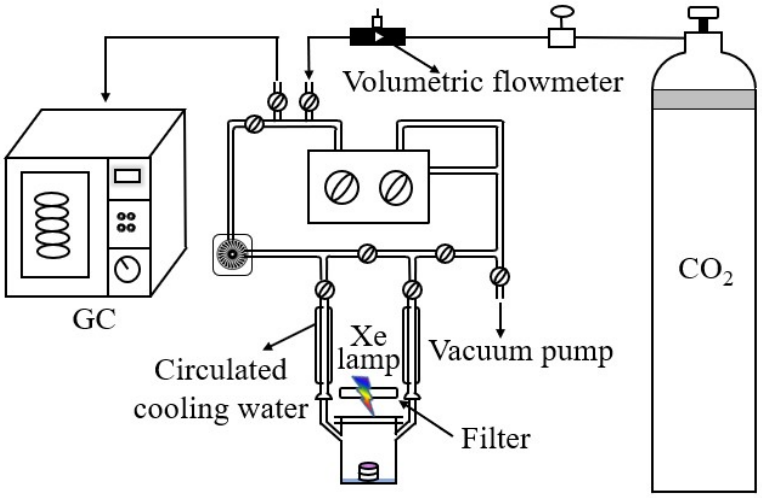

Fig. S1. Diagram of photocatalytic CO_2 reduction device.

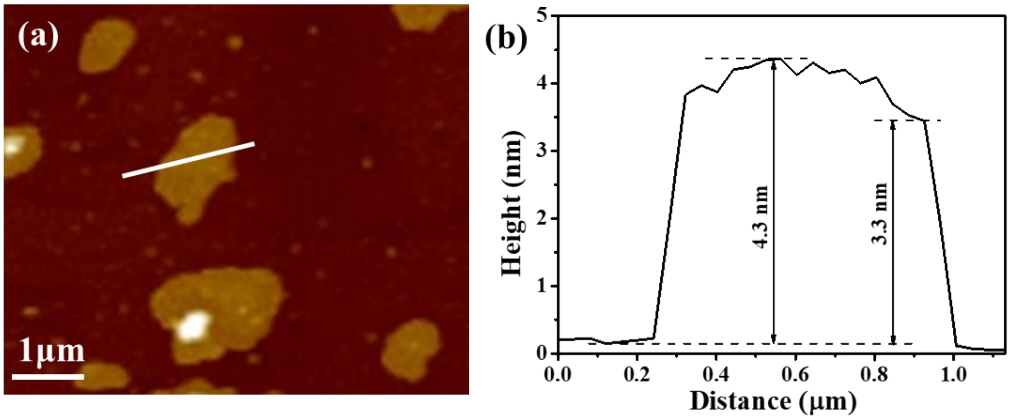

Fig. S2. (a) AFM image and (b) the corresponding height profile of Co-PMOF.

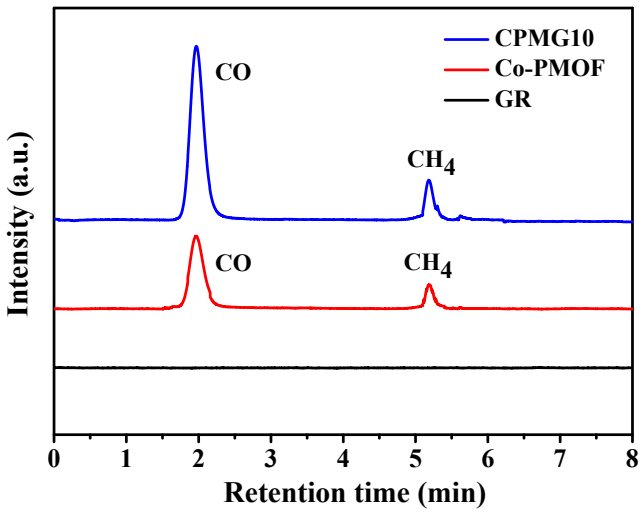

Fig. S3. Original chromatograms for the as-synthesized samples after 8 h of irradiation.

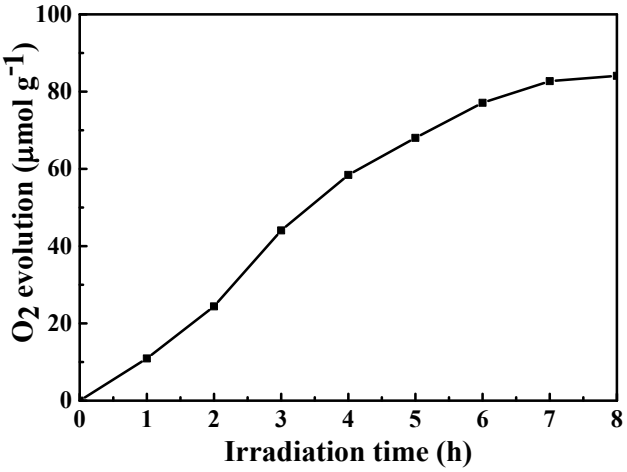

Fig. S4. Photocatalytic O_2 evolution over CPMG10.

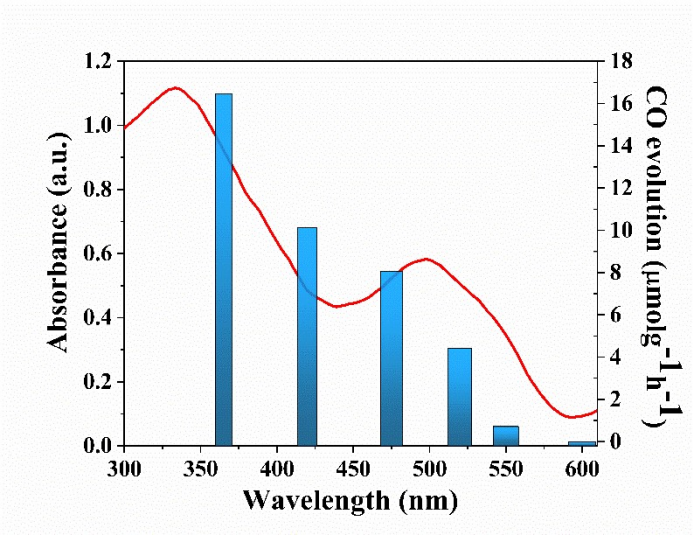

Fig. S5. Wavelength-dependence of the CO evolution rate over CPMG10.

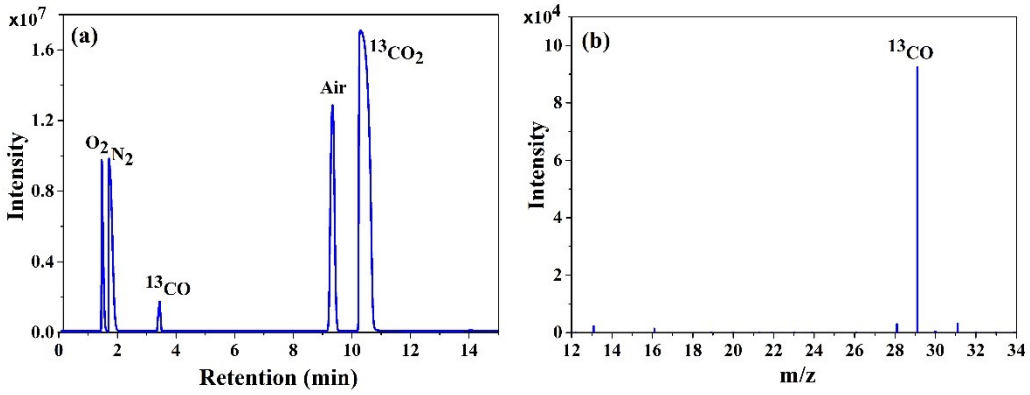

Fig. S6. GC-MS data of CO produced during photocatalytic $^{13}CO_2$ reduction over CPMG10.

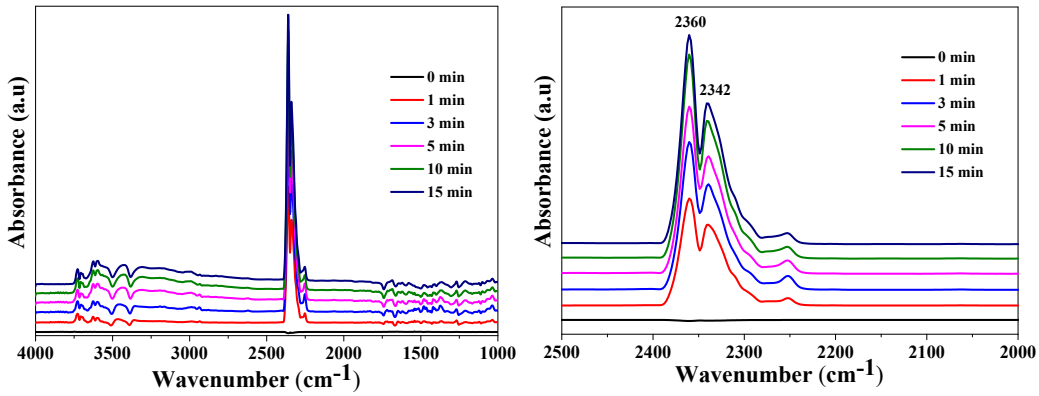

Fig. S7. In situ DRIFT spectra of CO_2 and H_2O absorption on CPMG10 in dark.

Table S1. Comparison of the photocatalytic performance in this work with the previous reported photocatalysts for CO_2 reduction.

Sample	Reaction condition	Light source	Yield rate ($\mu mol \cdot g^{-1} \cdot h^{-1}$)	Ref.
Co-PMOF/GR	CO_2/H_2O vapor	300 W Xe lamp (λ>420 nm)	20.25/1.61 (CO/CH_4)	This work
Co-MOF/Cu_2O	CO_2/H_2O vapor	300 W Xe lamp (λ>420 nm)	3.83 (CO)	1
CdS-P25/ZIF-67	CO_2/H_2O vapor	300 W Xe lamp (320≤λ≤780 nm)	14.9/15.8 (CO/CH_4)	2
$Co_{0.1}Ni_{0.9}$-MOF	CO_2/H_2O vapor	300 W Xe lamp	38.74 (CO)	3
CdS/Ni-MOF	CO_2/H_2O vapor	300 W Xe lamp	1.87/0.11 (CO/CH_4)	4
Zn-MOF/$BiVO_4$	CO_2/H_2O vapor	300 W Xe lamp (λ>420 nm)	4.31/0.62 (CO/CH_4)	5
PCN-222(Cu)/TiO_2	CO_2/H_2O vapor	300 W Xe lamp	13.24/1.73 (CO/CH_4)	6
$CsPbBr_3$@ZIF-8	CO_2/H_2O vapor	100 W Xe lamp equipped with AM 1.5G filter	15.49 (CO)	7
TiO_2/UiO-66	CO_2/H_2O vapor	300 W Xe lamp	17.9/1.9 (CH_4/CO)	8
TiO_2/NH_2-MIL-125(Ti)	CO_2/H_2O vapor	300 W Xe lamp (λ>420 nm)	1.18 (CH4)	9

References

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