

Supporting Information

Artificial light-harvesting 2D photosynthetic system with iron phthalocyanine/graphitic carbon nitride composites for highly efficient CO₂ reduction

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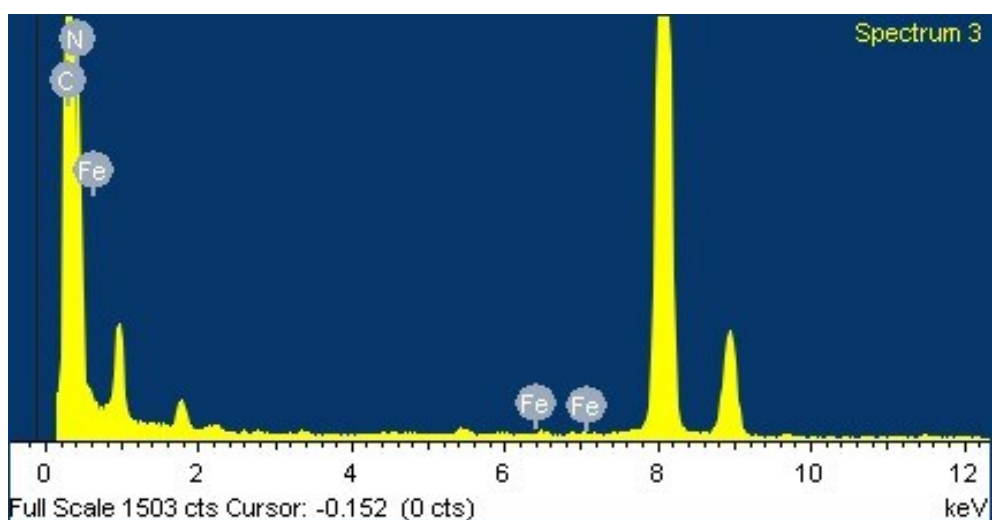


Fig. S1 The EDS spectra of FePc/g-C₃N₄ hybrid catalyst.

Table S1 The ICP-Fe results of FePc/g-C₃N₄ and FePc/g-C₃N₄@PET.

Sample	m(mg)	V(mL)	C(mg/L)	F	Result(mg/kg)
FePc/g-C ₃ N ₄ @PET	21.0	25	0.266	1	317
FePc/g-C ₃ N ₄	21.1	25	2.664	1	3156

(F: Dilution factor, result=CV/m)

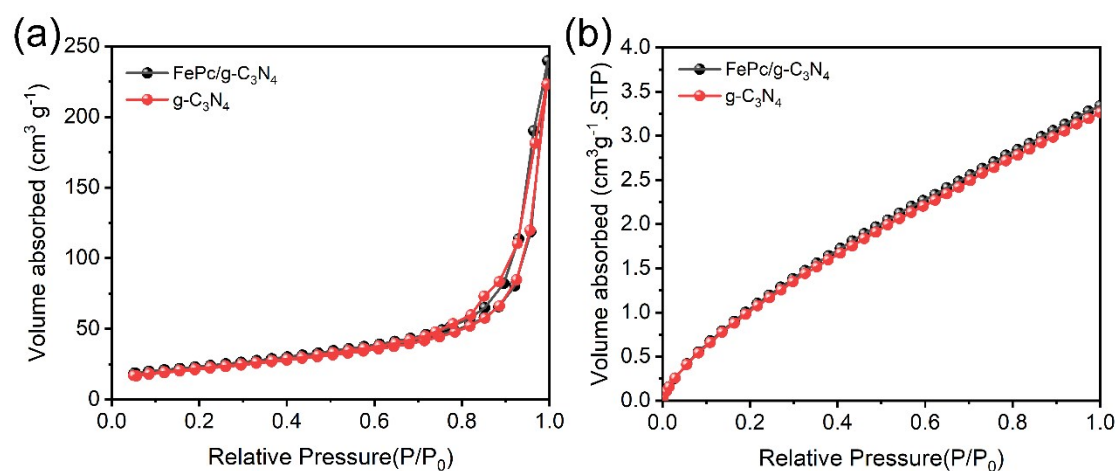
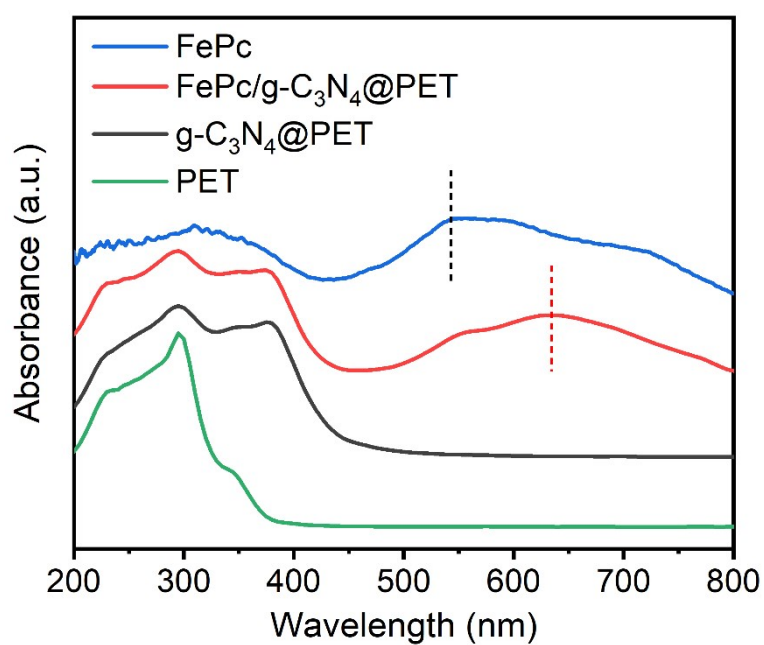


Fig. S2 N₂ adsorption-desorption isotherms (a) and CO₂ adsorption isotherms (b) of g-C₃N₄ and FePc/g-C₃N₄.

Table S2 Chemical composition of samples.

Samples	Chemical composition (wt%)		
	C	N	H
g-C ₃ N ₄	34.79	61.23	1.85
5%FePc/g-C ₃ N ₄	36.00	60.06	1.896
g-C ₃ N ₄ @PET	60.23	2.17	4.109
5%FePc/g-C ₃ N ₄ @PET	59.96	3.32	4.115
PET	61.74	0.00	4.322

**Fig. S3** UV-vis diffuse reflectance absorption spectra of PET, g-C₃N₄@PET and FePc/g-C₃N₄@PET.

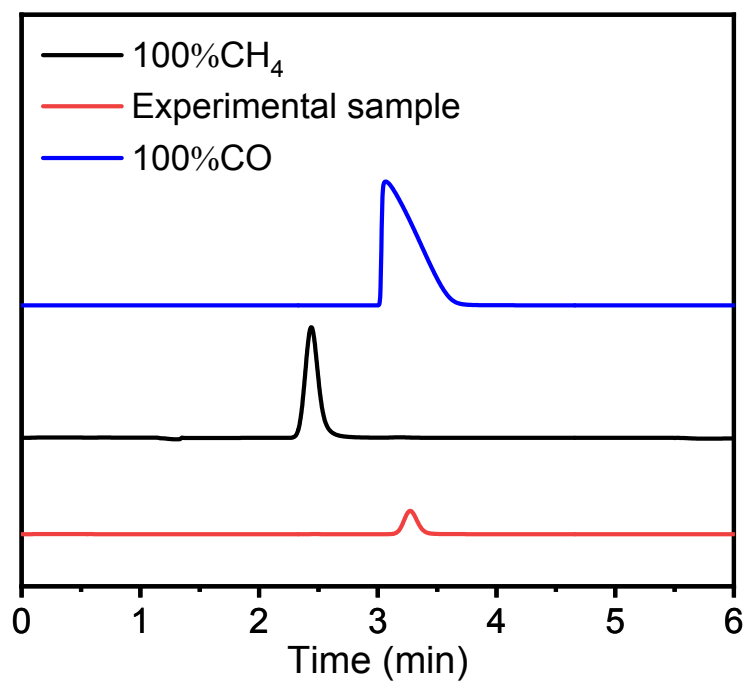


Fig. S4 GC Chromatogram of the product (CO).

Table S3 Blank experiment results of hybrid catalysts.

Parametrs					Yield($\mu\text{mol/g/h}$)	
g-C ₃ N ₄	Light	FePc	TEA	CO ₂	CO	CH ₄
✓	✓	✓	✓	✓	64.56	/
	✓	✓	✓		/	/
	✓	✓	✓	✓	/	/
✓	✓		✓		/	/
✓	✓	✓	✓		/	/
✓		✓	✓	✓	/	/
✓			✓	✓	/	/
✓	✓	✓		✓	/	/

Table S4 Blank experiment results of catalytic fibers.

Parametrs				Yield($\mu\text{mol/g/h}$)	
$\text{g-C}_3\text{N}_4@\text{LMPET}$	Light	$\text{FePc/g-C}_3\text{N}_4@\text{LMPET}$	CO_2	CO	CH_4
✓	✓	✓	✓	41.11	/
	✓	✓		/	/
	✓	✓	✓	/	/
✓	✓			/	/
✓	✓	✓		/	/
✓		✓	✓	/	/
✓			✓	/	/

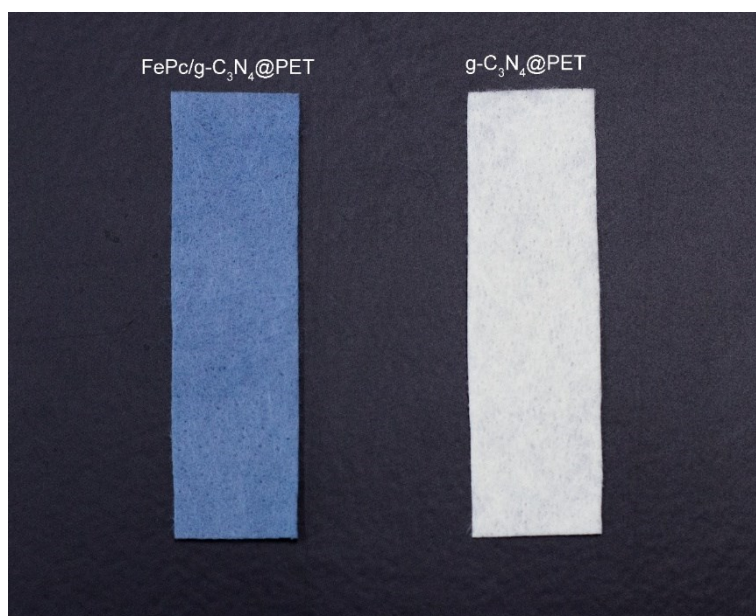
**Fig. S5** The visual appearances of $\text{FePc/g-C}_3\text{N}_4@\text{PET}$ and $\text{g-C}_3\text{N}_4@\text{PET}$.



Fig. S6 The CO₂ reduction devices under natural sunlight for catalytic fibers.