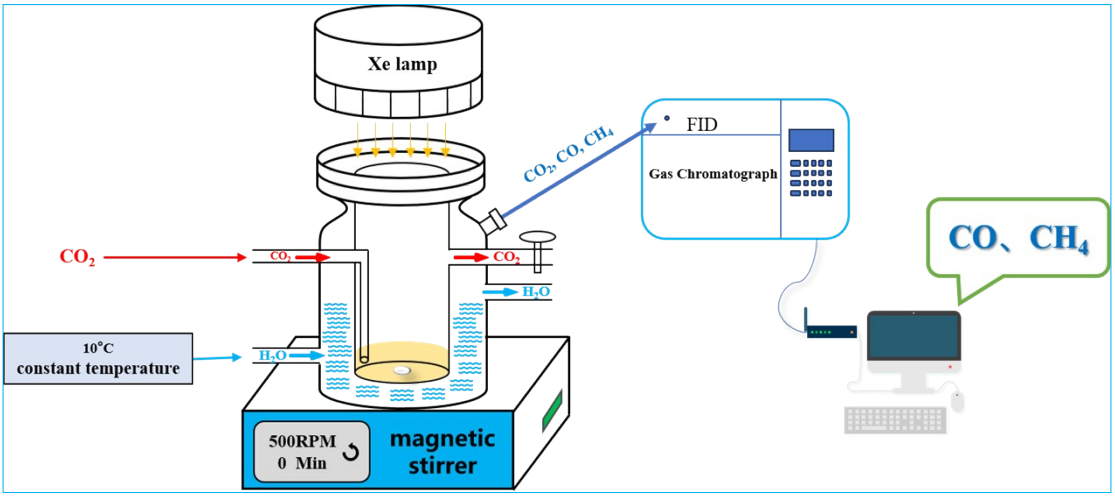
Supporting information

Fabrication of the direct Z-scheme heterojunction of UiO-66-NH_2 and tubular g-C_3N_4 for stable photocatalytic reduction of CO_2 to CO and CH_4

Hongyang Liu, Yang Yang, Chaojun Guo, Yonghua Zhou*

College of Chemistry and Chemical Engineering, Central South University, Changsha 410083, China



Schematic S1. The schematic of the photocatalytic reactor and the CO_2 reduction experiment conducted.

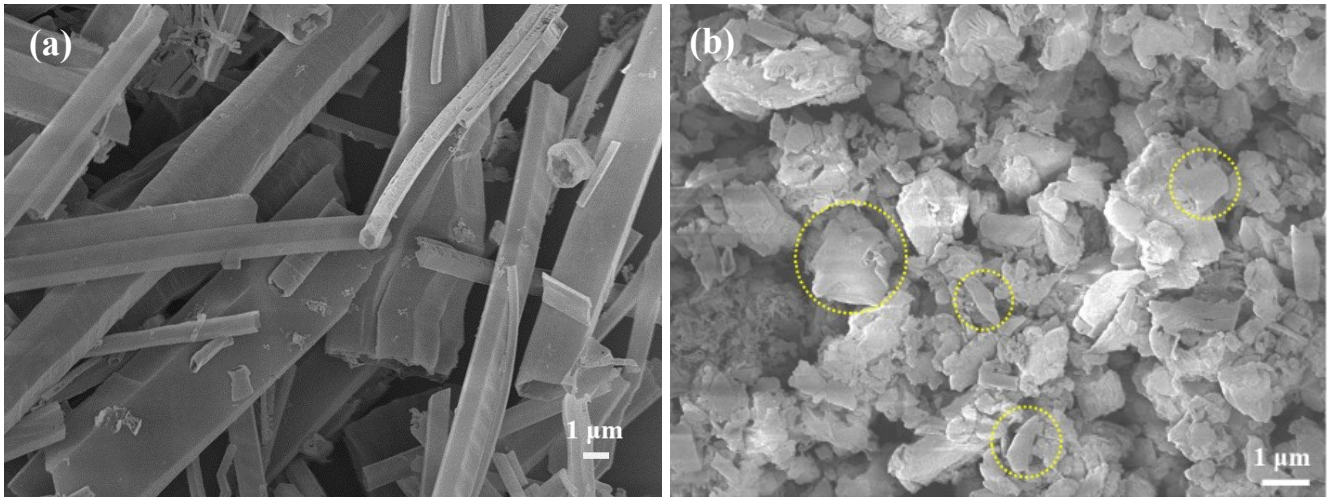


Fig. S1. SEM images of TCN (a) and SCN (b).

Table S1. XPS elemental content of UNH and T/U-0.65.

	Atomic%			
	C	N	O	Zr
UNH	53.98	5.36	33.93	6.74
T/U-0.65	51.51	31.37	15.6	1.52

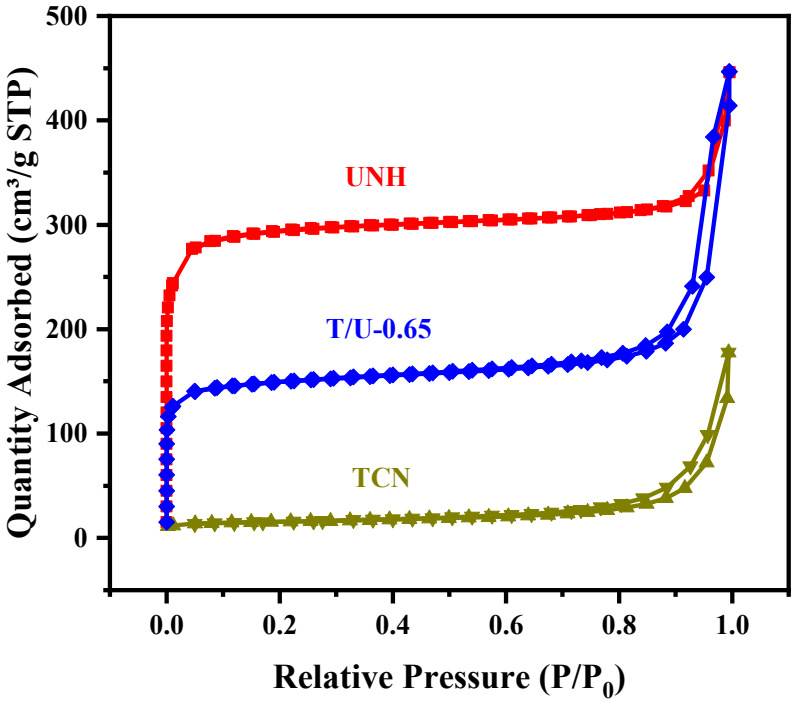


Fig. S2. N_2 adsorption-desorption isotherms of TCN, pure UNH and T/U-0.65.

Table S2. S_{BET} and pore volume data for TCN, pure UNH and T/U-0.65.

	S_{BET} (cm^2/g)	V_{total}(cm^3/g)	V_{mic}(cm^3/g)	V_{mes}(cm^3/g)
TCN	58	0.27	0.014	0.13
UNH	1172	0.69	0.44	0.25
T/U-0.65	592	0.68	0.20	0.48

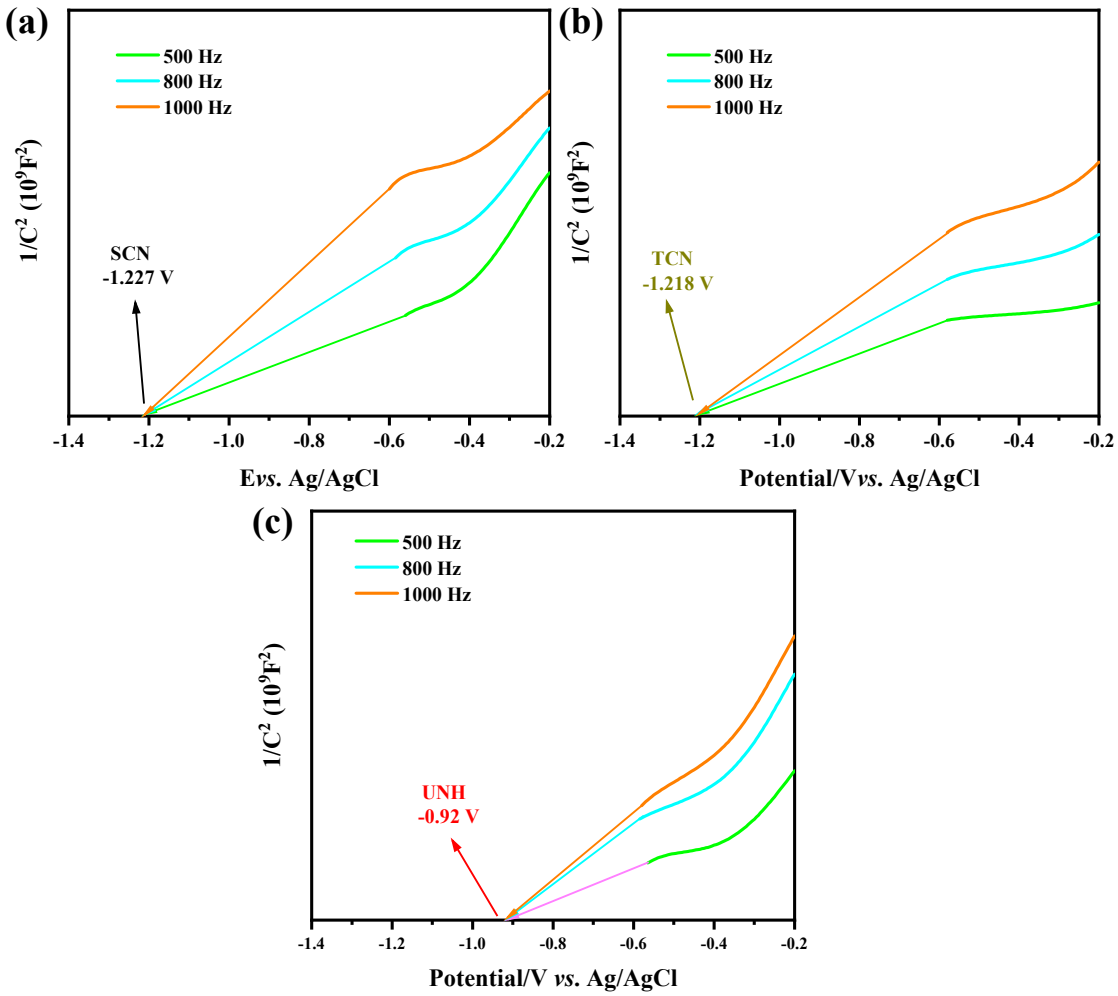


Fig. S3. Mott-Schottky curves of SCN (a), TCN (b) and pure UNH (c).

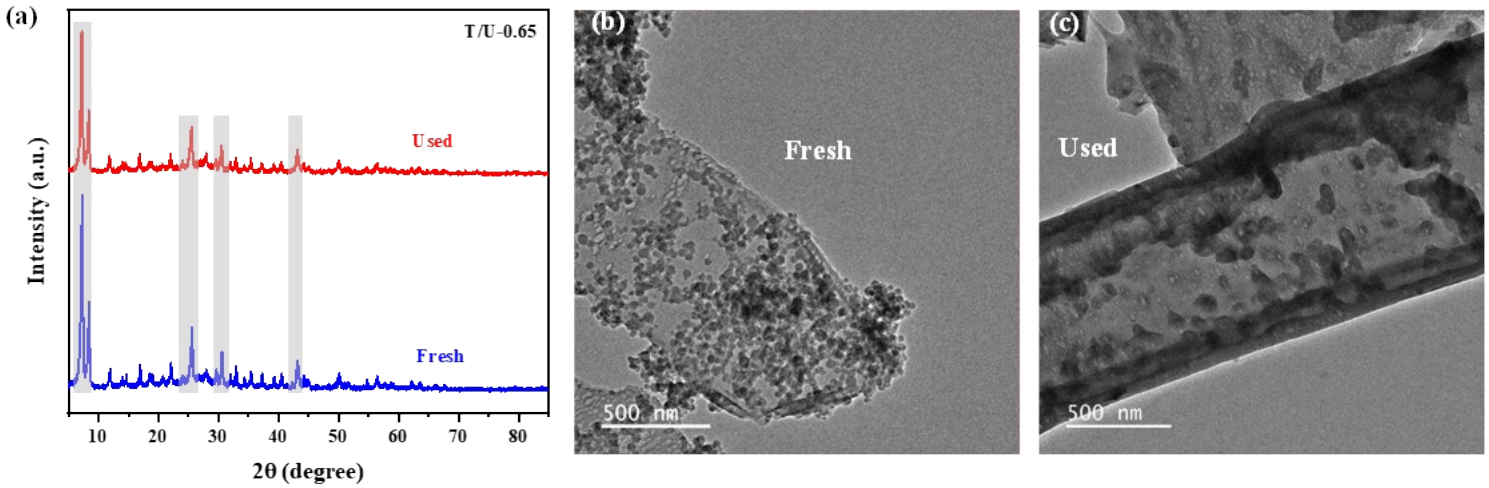


Fig. S4. XRD patterns (a) and TEM images (b, c) of fresh and used T/U-0.65 catalyst.

Table S3. Comparison of CO_2 photoreduction performance over some reported catalysts and this work.

Catalysts	CO and CH_4 yields ($\mu mol\ g^{-1}\ h^{-1}$)	S_{CH4} (%)	Reaction time(h)	Reducing agent	References
UiO-66-NH_2/Cu_2O/Cu-0.39	CO：4.54	0	12	H_2O	1
f-MoS_2@UiO-66-NH_2	CO：23.16 CH_4：27.18	82.44	25	H_2O, MeCN	2
8%NU66/CIS	CO：11.24 CH_4：2.92	51	18	H_2O	3
NH_2-UiO-66/CuZnS	CO：22.85	0	14	water vapor	4
UNH/Ce $(HCOO)_3$-1.80	CO：16.45 CH_4：29.4	84	15	H_2O, TEOA	5
NU/CC-1.6-90	CO：20.6 CH_4：14	73	15	H_2O, TEOA	6
UiO-66(NH_2)/HGN	CO：31.6 CH_4：1.82	18.7	48	H_2O, TEOA	7
T/U-0.65	CO：4.33 CH_4：14.68	93.1	**40**	H_2O, TEOA	This work

References

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