Immobilization of Perylenetetracarboxylic Dianhydride on Al_2O_3 for Efficiently Photocatalytic Sulfide Oxidation

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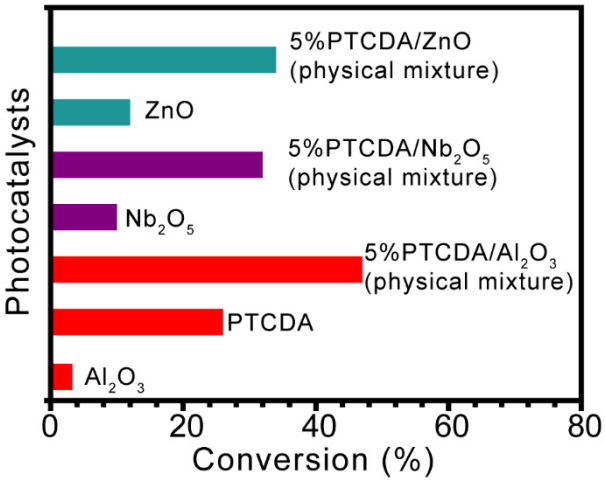


Figure S1 Comparison of activity of series photocatalysts. Reaction conditions: photocatalyst, 10 mg; methanol, 2 mL; substrate, 0.1 mmol; white LED (≥420 nm), 500 mW cm^{-2}; O_2, 1 atm.

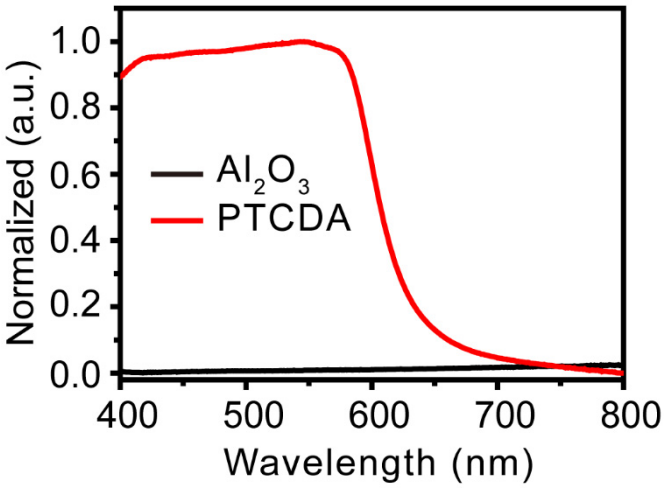


Figure S2 UV-Vis absorption spectra of PTCDA and Al_2O_3.

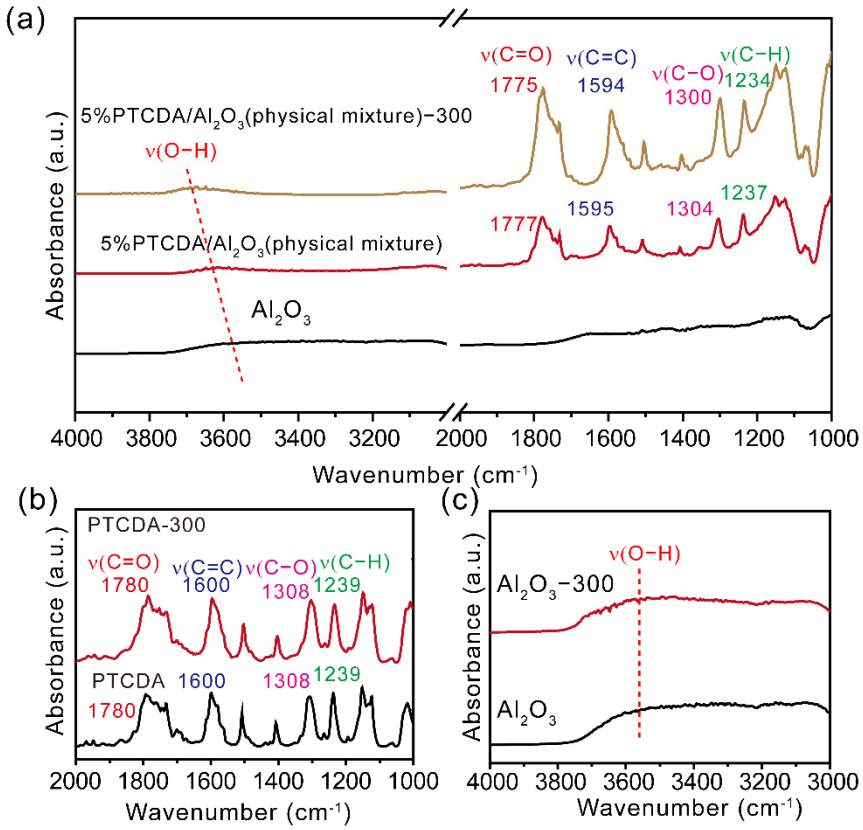


Figure S3 (a) DRIFTs spectra of Al_2O_3, PTCDA/Al_2O_3(physical mixture), and PTCDA/Al_2O_3(physical mixture)−300. PTCDA/Al_2O_3(physical mixture) calcining at 300 °C is symboled as PTCDA/Al_2O_3(physical mixture)−300. (b) DRIFTs spectra of PTCDA and PTCDA calcined at 300 °C (PTCDA−300). (c) DRIFTs spectra of PTCDA and PTCDA calcined at 300 °C (PTCDA-300).

Table S1. Control experiments to study photocatalytic sulfide oxidation.

Entry	Photocatalysts	Time (h)	Atmosphere	Conversion (%)
1	5%PTCDA/Al_2O_3(physical mixture)	6	Ar	0
2	5%PTCDA/Al_2O_3(physical mixture)	6	O_2	93
3	No	6	O_2	0
[a]4	5%PTCDA/Al_2O_3(physical mixture)	6	O_2	0

Reaction condition: photocatalyst, 10 mg; methanol, 2 mL; 0.1 mmol, thioanisole; white LED (≥420 nm), 500 mW cm^{-2}; O_2, 1 atm; time, 6 h. [a]The reaction is conducted in dark.

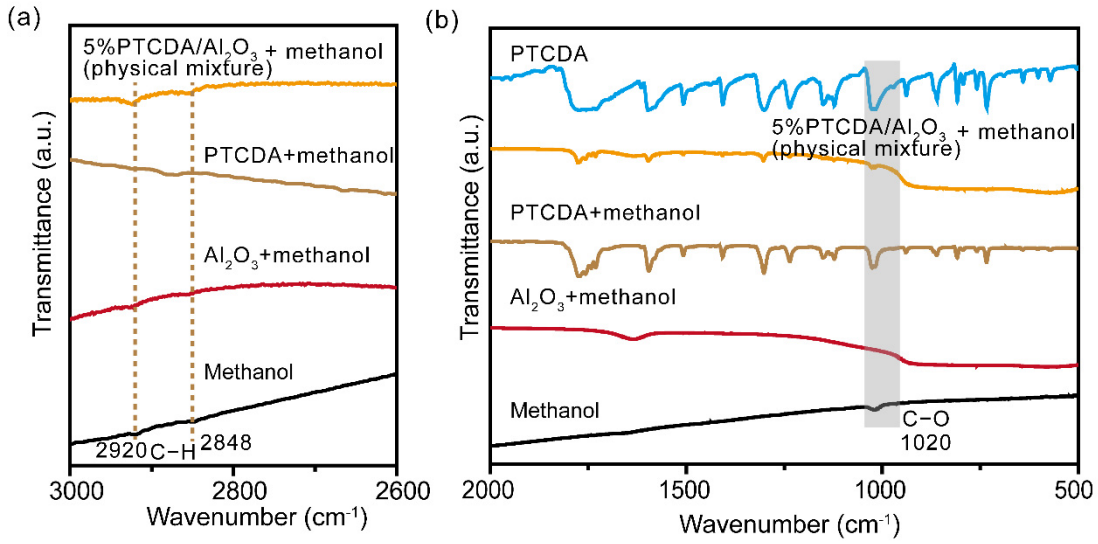
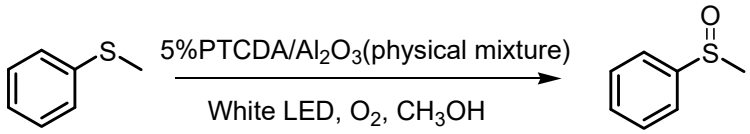


Figure S4 FTIR spectra of Al_2O_3, PTCDA, and 5%PTCDA/Al_2O_3(physical mixture) adsorbing methanol.

Table S2. Control experiments to study photocatalytic sulfide oxidation.



Entry	Photocatalysts	Time (h)	Conversion (%)	Yield (%)
1	5%PTCDA/Al_2O_3(physical mixture)	9	92	62

Reaction condition: photocatalyst, 50 mg; methanol, 25 mL; 1 g, thioanisole; white LED (≥420 nm), 500 mW cm^{-2}; O_2, 1 atm.

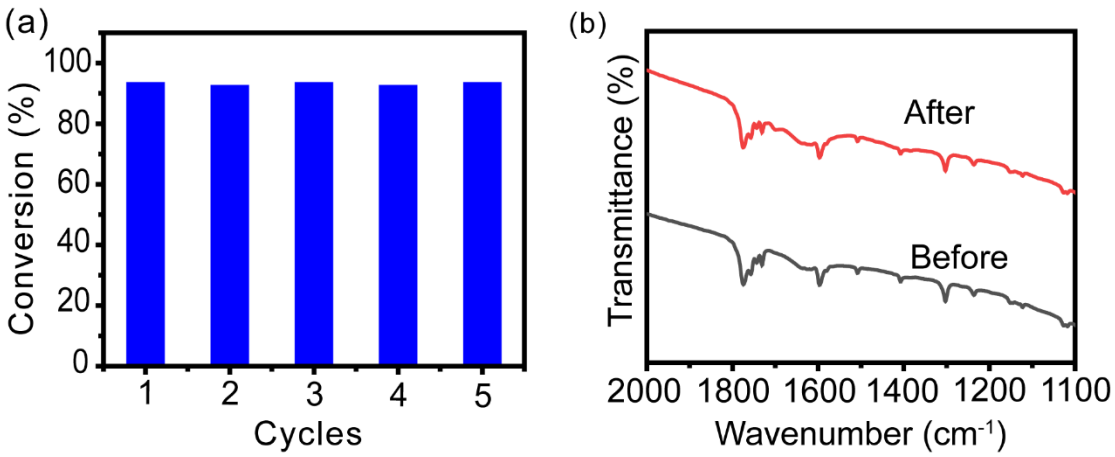


Figure S5 (a) Evaluation of photocatalytic stability. (b) FTIR spectra of 5%PTCDA/Al_2O_3(physical mixture) before and after reaction.