Supporting information for “Facile preparation of ZnS/g-C3N4 nanohybrids for enhanced optical properties”

Yongqian Shi,a,b Saihua Jiang,a,b Keqing Zhou,a Bibo Wang,a Biao Wang,a Zhou Gui,*a Yuan Hu,*a,b Richard K. K. Yuenbc

a State Key Laboratory of Fire Science, University of Science and Technology of China, 96 Jinzhai Road, Hefei, Anhui 230026, P.R. China.

b USTC-CityU Joint Advanced Research Centre, Suzhou Key Laboratory of Urban Public Safety, Suzhou Institute for Advanced Study, University of Science and Technology of China, 166 Ren’ai Road Suzhou, Jiangsu 215123, P.R. China.

c Department of Building and Construction, City University of Hong Kong, Tat Chee Avenue Kowloon, Hong Kong.

* To whom correspondence should be addressed.

Tel.: +86-551-3601288; fax: +86-551-3601669. E-mail address: zgui@ustc.edu.cn (Z. Gui).

and

Tel.: +86-551-3601664; fax: +86-551-3601664. E-mail address: yuanhu@ustc.edu.cn (Y. Hu).
**Experimental**

**Materials**

Urea, Zinc acetate dehydrate and thioacetamide were obtained from Sinopharm Chemical Reagent Co., Ltd (China).

**Preparation of g-C₃N₄**

The g-C₃N₄ nanosheets were fabricated by thermal pyrolysis. Briefly, urea was treated thermally in a crucible with a cover under ambient pressure in air. After dried at 80 °C, the urea was put in a Muffle Furnace and heated to 540 °C for 1 h and further kept at 540 °C for 5 h to complete the reaction. The as-obtained product was faint yellow color.

**Modification of g-C₃N₄ with ZnS**

80 mg g-C₃N₄ was re-dispersed in 60 mL deionized water with the assistance of ultrasonication at room temperature. Then, 10 mL 0.16 mmol L⁻¹ Zn²⁺ solution was transferred to the above-mentioned solution under agitation for 2 h followed by addition of 10 mL 0.24 mmol L⁻¹ thioacetamide. The as-prepared mixture was put into a 100 mL Teflon-lined autoclave and heated at 120 °C for 4 h. Finally, the precipitate was filtered, washed and dried in a vacuum oven at 60 °C over night. The as-synthesized product was labeled as ZnS/g-C₃N₄ (20 wt%). Both ZnS/g-C₃N₄ (40 wt%) and ZnS/g-C₃N₄ (80 wt%) were prepared by the similar hydrothermal route. For comparison, neat ZnS were also obtained under the same conditions.
Fig. 1S. Raman spectra of g-\( \text{C}_3\text{N}_4 \), ZnS and the nanohybrids.
Fig. 2S. The bandgap of nanohybrids vs different content of g-C₃N₄.
Fig. 3S. The change curves of enhancement factor with g-C₃N₄ content for all the nanohybrids.