

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

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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.

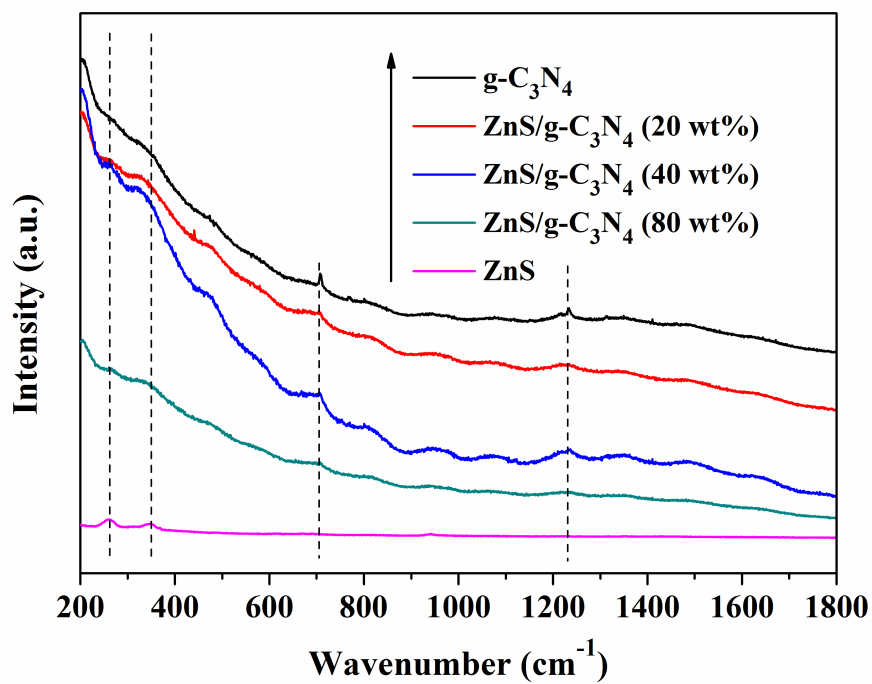


Fig. 1S. Raman spectra of g-C₃N₄, ZnS and the nanohybrids.

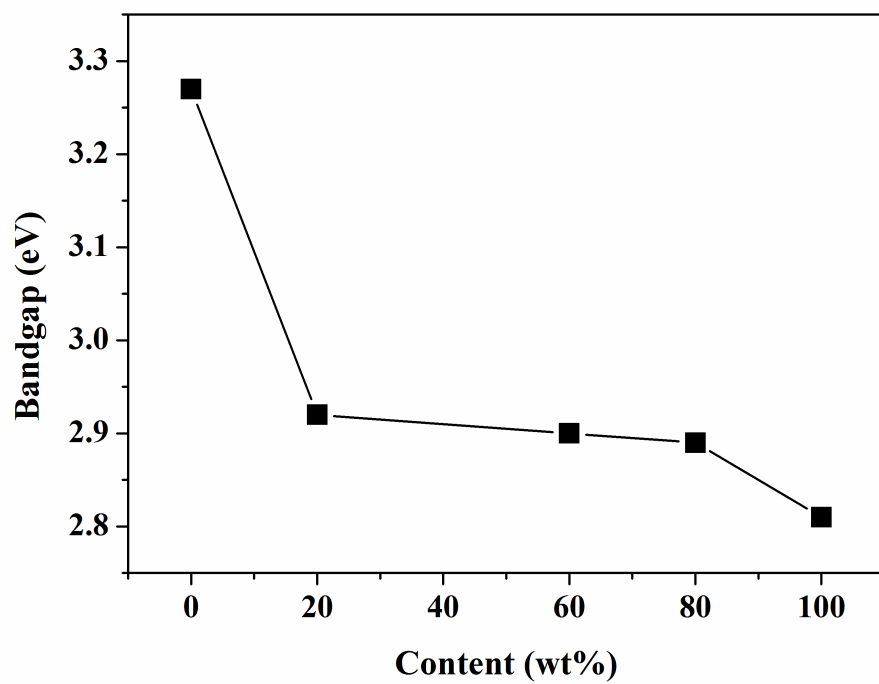


Fig. 2S. The bandgap of nanohybrids vs different content of g-C₃N₄.

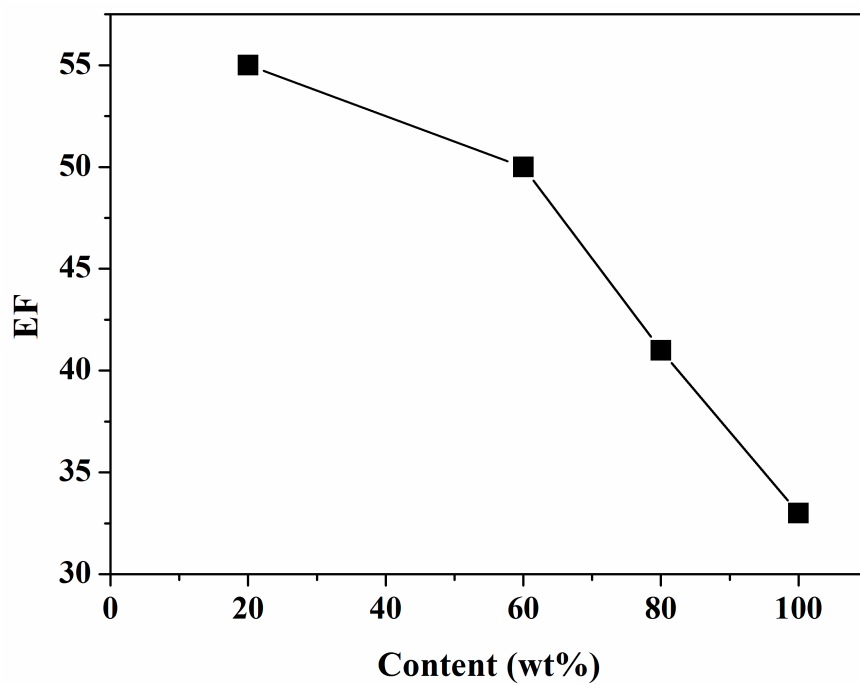


Fig. 3S. The change curves of enhancement factor with g-C₃N₄ content for all the nano hybrids.