

Electronic Supplementary Information (ESI)

Hexagonal tin disulfide nanoplatelets : A new photocatalyst driven by solar light

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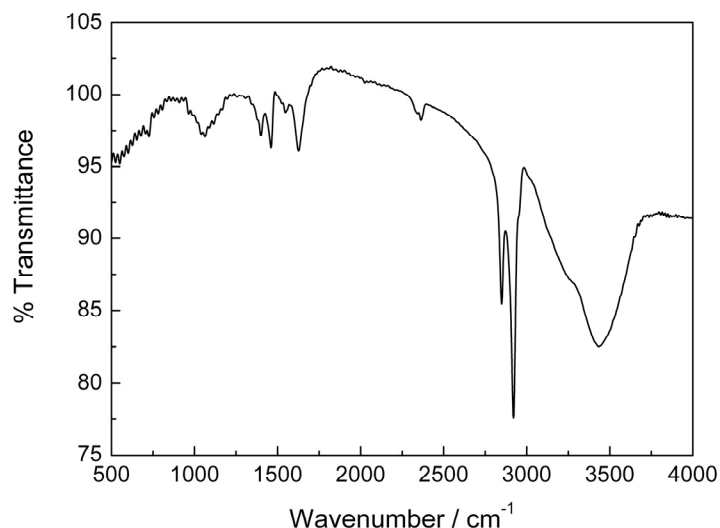


Fig. S1 FTIR spectrum of typical SnS₂ nanoplatelets capped by oleylamine

In the FTIR spectrum, the peaks appeared at 2920 and 2842 cm⁻¹ are the characteristic stretching absorption of methyl and methylene, and the peaks at 1623, 1458 and 1385 cm⁻¹ can be ascribed to the C-H bending vibration. The wide absorption peak at 1050 cm⁻¹ matches the C-N stretching vibration. Careful observation finds that the characteristic N-H stretching vibration of aliphatic primary amines had a certain displacement from 3400 and 3500cm⁻¹ to 3249 and 3420 cm⁻¹ which implied that a stronger interaction existed between tin disulfide and the capping ligand (oleylamine).

Synthesis of the bulk SnS₂ materials:

2mmol SnCl₄·5H₂O powder was added to 24 mL 1.0 mol·L⁻¹ diluted hydrochloric acid at room temperature. When SnCl₄·5H₂O powder fully dissolved, the resulting solution was transferred to a Teflon-lined stainless steel autoclave with a capacity of 30 mL and 20 mmol thioacetamide was added. After the autoclave was sealed and maintained at 180°C for 24 hours in a preheated oven, it was taken out and cooled to room temperature naturally. Yellow products were collected after being repeatedly washed with distilled water and dried in a vacuum oven.

Characterization techniques

Crystal phase of the as-prepared products was characterized on a Rigaku D/Max-2200 diffractometer equipped with a rotating anode and a Cu K α radiation source ($\lambda=0.15418$ nm). The morphology was characterized by field-emission scanning electron microscopy (FESEM, FEI SIRION-200, with an accelerating voltage of 5kV),

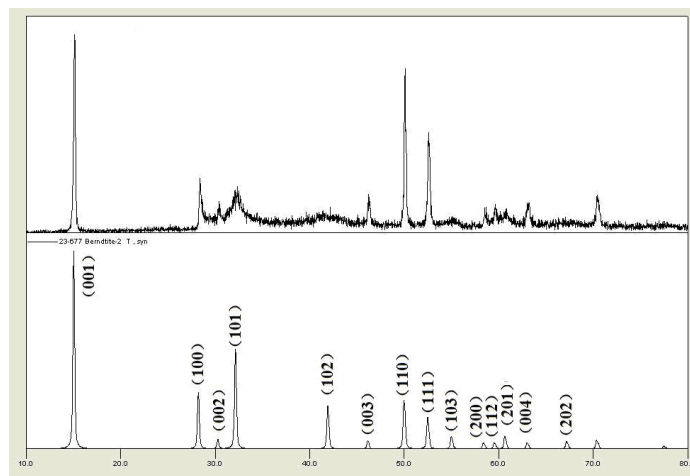


Fig. S2 XRD pattern of the bulk SnS₂ materials

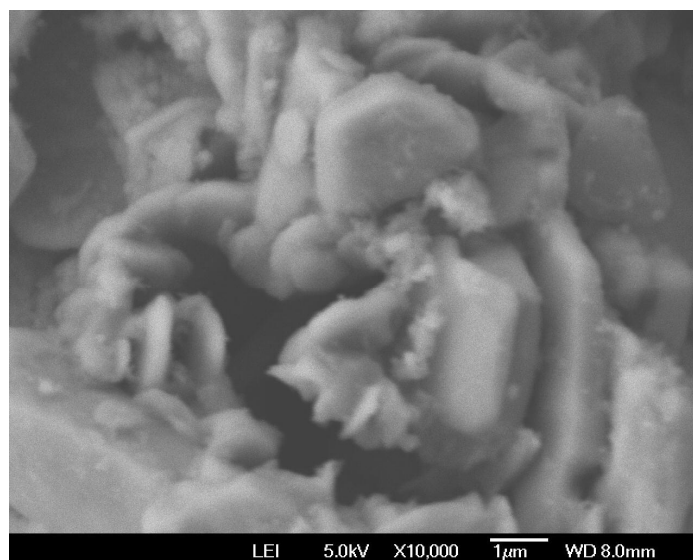


Fig. S3 SEM image of the bulk SnS₂ materials