

Fabrication and Characterization ZnS microspheres by using self assembly method for photocatalytic reactions

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ZnS is one of the important II-VI semiconductor materials with wide band gap energy 3.5–3.7 eV for cubic zinc blend structure and 3.7–3.8 eV for hexagonal wurtzite structure. In recent years, attention has been focused on heterogenous photocatalysis of the treatment of toxic pollutants present in the wastewater. In this work, ZnS microspheres consisting of the nanoblocks were fabricated by simple one step assembly method employing a hydrothermal process using $\text{Zn}(\text{CH}_3\text{COO})_2$ and $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ as precursors in the aqueous solution. The products were characterized by field-emission scanning electron microscopy (FE-SEM), X-ray diffraction (XRD), X-ray photoelectron spectrometer (XPS) and Brunauer-Emmett-Teller (BET). The photocatalysts were evaluated using the photodecomposition of methylene blue under UV light. The special microspheres structure supplies a good chance for promoting the performance of materials, which may find applications in catalysis, sensors, absorption, separation, and dye sensitized solar cells.