

## Optimization of CdS/TiO<sub>2</sub> Nano-Bulk Composite (NBC) Photocatalysts for Hydrogen Production from Na<sub>2</sub>S/Na<sub>2</sub>SO<sub>3</sub> Aqueous Electrolyte Solution under Visible Light ( $\lambda \geq 420\text{nm}$ )

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Nano-bulk composite (NBC) photocatalysts based on bulk CdS were fabricated as precipitation method and sol-gel synthesis. CdS-TiO<sub>2</sub> NBC photocatalyst consisted of bulky CdS with a high crystallinity decorated with nanosized TiO<sub>2</sub> particles. This configuration of the composite photocatalyst exhibited an unprecedented high rate of hydrogen production under visible light irradiation ( $\lambda \geq 420\text{nm}$ ) from water containing sulfide and sulfite as hole scavengers. In this work, we investigated the physicochemical properties of CdS(bulk)/TiO<sub>2</sub> composite photocatalysts and optimized their preparation conditions for the high photocatalytic activity of hydrogen production from water containing Na<sub>2</sub>S and Na<sub>2</sub>SO<sub>3</sub> as a sacrificial reagents under visible light irradiation.