

Hydrogen Production over Nano Bulk Composite (NBC) Photocatalyst Based on Bulk CdS under Visible Light Irradiation ($\lambda \geq 420\text{nm}$)

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Nano-Bulk composite (NBC) photocatalysts based on bulk CdS were fabricated as precipitation method and sol-gel synthesis. The contact between two phases was maximized and the electron carrier component was in a nanoparticulate form. Their photocatalytic activity of H₂ production was investigated from aqueous solution containing hole scavengers such as sulfide and sulfite under visible light irradiation ($\lambda \geq 420\text{nm}$). The amount of hydrogen evolution of CdS based-composite photocatalyst was increased by ca. 4.5 times from that of single-phase CdS photocatalyst. Therefore, in this work, it could be confirmed that the formation of NBC photocatalyst is an effective strategy to acquire an active photocatalyst probably because the photoelectrons generated from CdS photocatalyst diffuse rapidly toward TiO₂ nanoparticles enabling an efficient electron-hole separation.