

Eosin-Y dye sensitized Co-TiO₂ photocatalysts for efficient water splitting under visible light

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Cobalt-doped TiO₂ (Co-TiO₂) photocatalyst was prepared by the impregnation method using TiO₂ powder (P-25) and Co(NO₃)₂ · 6H₂O. Eosin Y dye was employed for the sensitization on the surface of Co-TiO₂ catalyst. By the morphological, Co particles was apparently seen or aggregated on the outer surface and near the outer surface of TiO₂ via normal impregnation method. UV-DRS spectra was shown significant blue shift that confirmed Co doping into TiO₂, further dye sensitized on Co-TiO₂ catalyst showed a longer shift with hump peak within the wide wavelength range of 450-580 nm with decreased in the band gap (2.48 eV). By photocatalytic water splitting results, eosin Y-Co/TiO₂ catalyst obtains very high rates of H₂ evolution of ~ 1232.6 (mol/g.cat/h) as compared to Co-doped TiO₂ and bare TiO₂ which might attribute to the increased surface oxygen defects by cobalt doping for the adsorption of Eosin Y on Co-doped TiO₂.