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Adsorption and Photocatalytic Performances of BiOI Nanostructures for Methyl Orange and Rhodamine B: Ag and Ti-Loading Effects

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We synthesized BiOI nanostructures with various doped-concentrations of Ag (0.1, 1.0, 5.0, 10.0 mol%) and Ti (1.0, 5.0, 10.0, 30.0, 50.0 mol%). They show spherical echinoid-like structures examined by scanning electron microscope. The BET surface areas were measured to be in the range of 40~70 m²/g, which is reduced by doping. The indirect band gap was estimated to be 1.8 eV for undoped BiOI with no change and 1.0 eV increase upon Ag and Ti doping, respectively. The structures were further examined by X-Ray diffraction analysis, FT-IR, and photoluminescence. We also demonstrated adsorption and photocatalytic degradation performances for methyl orange and Rhodamine B on the echinoid-like BiOI structures.

Keywords: BiOI, Adsorption, Photocatalysis, Dye degradation