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Preparation of Yb³⁺ doped microspherical BiOI and its photocatalytic activity for the degradation of Rhodamine B in water

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Bismuth oxychloride (BiOI) has a good visible light responsive property due to their relatively narrow band gap, and its photocatalytic performance is further improved by doping ytterbium ions (Yb³⁺) which could be attributed to stronger optical absorption in UV-visible light region, effective separation of the photogenerated electron-hole pairs, and the capacity of Yb³⁺ ions to up-convert near-IR light into visible-light and UV light. In this study, a facile solvothermal method was adopted to synthesize different Yb³⁺ ions doped BiOI photocatalysts. The doped photocatalysts with molar ratios of 0, 0.5, 1, 1.5, 2 and 2.5% Yb³⁺ ions were prepared and 2% Yb³⁺ ions doped BiOI exhibited the highest photocatalytic degradation efficiency, which was 2 times higher than that of pure BiOI. As-prepared photocatalysts were further studied through SEM, XRD, UV-Vis DRS and free radical capture experiments, etc. which indicated that the doping ions entered into Lattice of BiOI photocatalysts and improved the photocatalytic performance. This work provided some potential application of Yb³⁺ doped BiOI for the degradation of organic contaminants in water.

Biography

Linping Zhang has completed her PhD from the Chinese University of Hong Kong. She is an Associate Professor of Donghua University in China. She has published more than 45 papers in reputed journals.

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