Fabrication of BiOI Nanoflowers Decorated TiO₂ Nanotube Arrays on Porous Titanium with Enhanced Photocatalytic Performance for Rhodamine B Degradation

Yu-Long Xie^{}, Li-Fang Guo, Cuo-Ji Ben*

Key Laboratory of Resource Chemistry and Eco-environmental Protection in Tibetan Plateau of State Ethnic Affairs Commission, School of Chemistry and Chemical Engineering, Qinghai Minzu University, Xining, Qinghai, 810007, China

*E-mail: yulongxie2012@126.com

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We successfully deposited the BiOI nanosheets onto the surface of three-dimensional porous TiO₂ nanotube arrays (NTs) substrate by the successive ionic layer adsorption and reaction (SILAR) method. The coupling of BiOI and TiO₂ NTs significantly improved the photocatalytic activity of Rhodamine B (RhB) degradation under visible-light irradiation. By further investigating the charge transportation and separation behaviors, the energy band structure experiments were carried out. Thus, a possible photocatalysis mechanism of p-n Heterojunction was proposed, which not only facilitated the effective separation of photoelectrons, but also proved the advanced capability of photoelectrocatalysis in the degradation of organic dyes. According to the results of calculation and experiment, the possible mechanism of enhancement of photocatalytic activity of BiOI/TiO₂ NTs was proposed, and the conclusion was confirmed by the photocurrent experiment.

Keywords: TiO₂ nanotube arrays, BiOI, Photocatalytic, Photoelectrochemical performance

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