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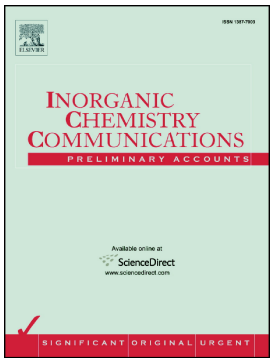

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Preparing BiOI photocatalyst for degradation of methyl blue in wastewater

Jingnan Zhang[a,1], Zhizhong Chen[a,1], Yunyi Qiu[c], Mingyang Li[a]*, Hao Yang[a]*, Yongchao Huang[b]* and Jian Chen[a],

a. The Key Lab of Low-Carbon Chemistry & Energy Conservation of Guangdong Province, MOE of the Key Laboratory of Bioinorganic and Synthetic Chemistry, Sun Yat-sen University, China

b. Key Laboratory for Water Quality and Conservation of the Pearl River Delta, Ministry of Education, Institute of Environmental Research at Greater Bay, Guangzhou University

c Guangzhou NO.1 High School, Guangzhou

[1] These authors contributed equally to this work.

E-mail: yanghao9@mail2.sysu.edu.cn (H. Yang); limy6@mail2.sysu.edu.cn (M. Li); huangych@gzhu.edu.cn (Y. Huang)

Abstract

Photocatalytic oxidation on semiconductors is a green and friendly route to deal with environmental issues. Herein, a novel C/$BiOI_{defect}$ photocatalyst was prepared by one-step hydrothermal method, and this nanocomposite exhibited excellent photocatalytic degradation performance under visible light irradiation. The substantially increased visible light absorption and separation of photoinduced carriers were attributed to the high photocatalytic performance. Moreover, the C/$BiOI_{defect}$ also shows outstanding adsorption capacity and photochemical stability, which are also extremely important for practical application.

Keyword

Bismuth oxyhalide; photocatalysis; oxygen vacancy; carbon; charge separation

Bismuth oxyiodide (BiOI) is considered as one of the most photocatalysts due to its greatest light absorption and special structure[1-4]. However, the quick recombination rate of photogenerated carriers limits its application[5-7]. In recent years, many strategies have been performed to enhance the photocatalytic performance of BiOI, such as heterojunction, defect construction or elemental doping. For example, heterostructures of BiOI-based can greatly facilitate the separation of photogenerated electron-hole pairs and suppress their recombination, and hence enhance the photocatalytic activity. Many BiOI heterojunction photocatalysts such as BiOI/ZnO[8], Pt/BiOI/MnO_x[9], BiOI/$Bi_4O_5I_2$[5], BiOI/BiOBr[10] and BiOI/BiOCl[11] have been developed and showed enhanced photoactivity.

In addition, recent reports have been demonstrated that BiOI with oxygen vacancies can absorb visible light and display excellent photocatalytic