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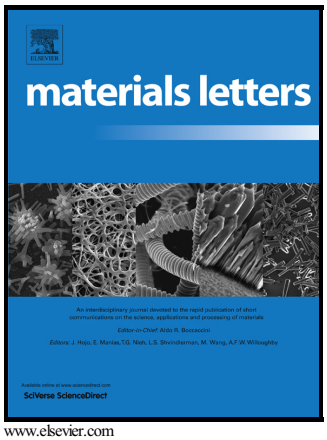

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One-step synthesis of porous BiOBr film and Bi nanopowder simultaneously from Bi plate via electrochemical method

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Abstract: A novel electrochemical approach has been developed to prepare porous BiOBr thin film and Bi nanopowder simultaneously with bulk Bi plate as anode and Ti sheet as cathode. The structures, morphologies, and optical properties of BiOBr/Bi film and Bi nanopowder were characterized by XRD, SEM, TEM, HRTEM and DRS. A possible formation mechanism of obtained products has been proposed. Furthermore, the BiOBr/Bi film has also been used in the photodegradation of methyl orange (MO) and bisphenol A (BPA) under ultraviolet light irradiation, the results indicated that the BiOBr/Bi film expressed excellent photocatalytic activities and good chemical stability, facilitating its practical application.

Key words: BiOBr/Bi film; Bi nanopowder; electrochemical method; formation mechanism; photocatalytic activity; semiconductor

1. Introduction

Over the last decades, tremendous efforts have been put into the exploitation of semiconductors to improve their photocatalytic activity in the treatment of wastewater [1,2]. Among various semiconductors, BiOBr has drawn considerable attention due to its suitable band gap energy and high stability [3]. It was also reported that BiOBr has