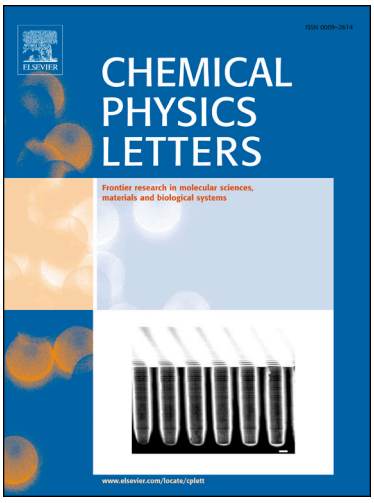

Research paper

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In-situ growth of $ZnIn_2S_4$ decorated on electrospun TiO_2 nanofibers with enhanced visible-light photocatalytic activity

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Abstract: A series of $ZnIn_2S_4$ nanosheets/TiO_2 nanofibers heterojunctions were fabricated through an electrospinning-hydrothermal two-step process. The $ZnIn_2S_4$ nanosheets were intensively and uniformly covered on the surface of TiO_2 nanofibers. The $ZnIn_2S_4$/TiO_2 heterojunctions exhibited enhanced visible-light photocatalytic activity compared to the individual TiO_2 nanofibers and $ZnIn_2S_4$ nanosheets in the photodegradation of methyl orange, especially, when the molar ratio of $ZnIn_2S_4$ to TiO_2 was 20:100, the $ZnIn_2S_4$/TiO_2 catalysts exhibited the optimum photocatalytic activity. The improved visible-light photocatalytic performance was ascribed to a Z-scheme photocatalytic process, abundant active sites of $ZnIn_2S_4$ nanosheets as well as efficient photogenerated charge separation.

Keywords: $ZnIn_2S_4$ nanosheets; TiO_2 nanofibers; Z-scheme photocatalyst; Heterojunctions; Methyl orange

1. Introduction

Titanium dioxide (TiO_2) was firstly introduced to photoelectrochemically splitting water under UV irradiation in the pioneering work of Fujishima and Honda in 1972 [1]. Since then, TiO_2 as a potential photocatalyst was extensively studied on the fields of energy development and environment remedy due to its high reactivity,