

Accepted Manuscript

Research paper

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PII: S0009-2614(18)30464-0

DOI: <https://doi.org/10.1016/j.cplett.2018.05.074>

Reference: CPLETT 35690

To appear in: *Chemical Physics Letters*

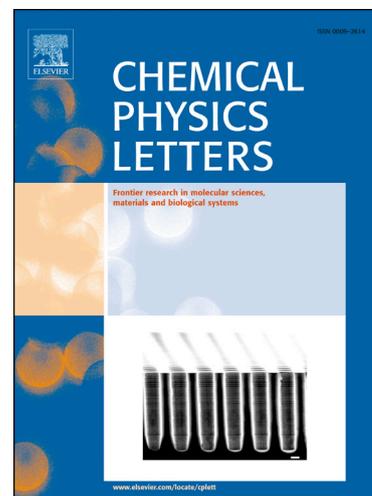
Received Date: 2 April 2018

Revised Date: 28 May 2018

Accepted Date: 29 May 2018

Please cite this article as: S. Chen, S. Li, L. Xiong, G. Wang, In-situ growth of ZnIn_2S_4 decorated on electrospun TiO_2 nanofibers with enhanced visible-light photocatalytic activity, *Chemical Physics Letters* (2018), doi: <https://doi.org/10.1016/j.cplett.2018.05.074>

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In-situ growth of ZnIn₂S₄ decorated on electrospun TiO₂ nanofibers with enhanced visible-light photocatalytic activity

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Abstract: A series of ZnIn₂S₄ nanosheets/TiO₂ nanofibers heterojunctions were fabricated through an electrospinning-hydrothermal two-step process. The ZnIn₂S₄ nanosheets were intensively and uniformly covered on the surface of TiO₂ nanofibers. The ZnIn₂S₄/TiO₂ heterojunctions exhibited enhanced visible-light photocatalytic activity compared to the individual TiO₂ nanofibers and ZnIn₂S₄ nanosheets in the photodegradation of methyl orange, especially, when the molar ratio of ZnIn₂S₄ to TiO₂ was 20:100, the ZnIn₂S₄/TiO₂ catalysts exhibited the optimum photocatalytic activity. The improved visible-light photocatalytic performance was ascribed to a Z-scheme photocatalytic process, abundant active sites of ZnIn₂S₄ nanosheets as well as efficient photogenerated charge separation.

Keywords: ZnIn₂S₄ nanosheets; TiO₂ nanofibers; Z-scheme photocatalyst; Heterojunctions; Methyl orange

1. Introduction

Titanium dioxide (TiO₂) was firstly introduced to photoelectrochemically splitting water under UV irradiation in the pioneering work of Fujishima and Honda in 1972 [1]. Since then, TiO₂ as a potential photocatalyst was extensively studied on the fields of energy development and environment remedy due to its high reactivity,

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