

Accepted Manuscript

Construction of $\text{In}_2\text{Se}_3/\text{MoS}_2$ heterojunction as photoanode toward efficient photoelectrochemical water splitting

Yan Jiang, Qi Wang, Lu Han, Xiangyong Zhang, Liangxing Jiang, Zhuangzhi Wu, Yanqing Lai, Dezhi Wang, Fangyang Liu

PII: S1385-8947(18)32037-0
DOI: <https://doi.org/10.1016/j.cej.2018.10.088>
Reference: CEJ 20151

To appear in: *Chemical Engineering Journal*

Received Date: 11 July 2018
Revised Date: 17 September 2018
Accepted Date: 9 October 2018

Please cite this article as: Y. Jiang, Q. Wang, L. Han, X. Zhang, L. Jiang, Z. Wu, Y. Lai, D. Wang, F. Liu, Construction of $\text{In}_2\text{Se}_3/\text{MoS}_2$ heterojunction as photoanode toward efficient photoelectrochemical water splitting, *Chemical Engineering Journal* (2018), doi: <https://doi.org/10.1016/j.cej.2018.10.088>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Construction of In₂Se₃/MoS₂ heterojunction as photoanode toward efficient photoelectrochemical water splitting

Yan Jiang^{a,1}, Qi Wang^{a,1}, Lu Han^a, Xiangyong Zhang^b, Liangxing Jiang^{a,*},
Zhuangzhi Wu^b, Yanqing Lai^a, Dezhi Wang^b, Fangyang Liu^{a,*}

* Corresponding author

E-mail address: lxjiang@csu.edu.cn(Liangxing Jiang),

liufangyang@csu.edu.cn(Fangyang Liu)

Y. J. and Q.W. contributed equally to this work.

^a School of Metallurgy and Environment, Central South University, Changsha, 410083, China.

^b School of Materials Science and Engineering, Central South University, Changsha, 410083, China.

KEYWORDS: κ -In₂Se₃; MoS₂ nanopetals; Heterostructure; Photoanode; P-N junction

ABSTRACT: κ -In₂Se₃, a rarely reported phase of indium selenide, is synthesized here using a hot-injection method. The hexagonal nanoplates show photoresponses at positive bias, thus is considered as a potential material for photoanode utilization. In order to further improve the photoelectrocatalytic performance of κ -In₂Se₃, MoS₂ nanopetals are introduced by a solution-based ultrasonic method. The In₂Se₃/MoS₂ heterojunction exhibits a significantly higher photocurrent density and higher PEC O₂ evolution amount than those of pristine In₂Se₃. PL test shows that the charge separation is promoted, due to numerous p-n junctions formed at the interfaces of In₂Se₃/MoS₂. This led to more efficient utilization of photogenerated electron-hole pairs. Moreover, the charge transfer resistance is greatly reduced by the cooperative

Download English Version:

<https://daneshyari.com/en/article/11263174>

Download Persian Version:

<https://daneshyari.com/article/11263174>

[Daneshyari.com](https://daneshyari.com)