

Accepted Manuscript

Optimization of chemical bath deposited cadmium sulfide buffer layer for high-efficient CIGS thin film solar cells

Zhangbo Lu, Ranran Jin, Ya Liu, Longfei Guo, Xinsheng Liu, Jingling Liu, Ke Cheng, Zuliang Du

PII: S0167-577X(17)30852-2
DOI: <http://dx.doi.org/10.1016/j.matlet.2017.05.117>
Reference: MBLUE 22692

To appear in: *Materials Letters*

Received Date: 7 April 2017
Revised Date: 24 April 2017
Accepted Date: 26 May 2017

Please cite this article as: Z. Lu, R. Jin, Y. Liu, L. Guo, X. Liu, J. Liu, K. Cheng, Z. Du, Optimization of chemical bath deposited cadmium sulfide buffer layer for high-efficient CIGS thin film solar cells, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.05.117>

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.



Optimization of chemical bath deposited cadmium sulfide buffer layer for high-efficient CIGS thin film solar cells

*Zhangbo Lu, Ranran Jin, Ya Liu, Longfei Guo, Xinsheng Liu, Jingling Liu, Ke Cheng, Zuliang Du**

Key Laboratory for Special Functional Materials of Ministry of Education, Collaborative Innovation Center of Nano Functional Materials and Applications, Henan Province, Henan University, Kaifeng, 475004, PR. China.

ABSTRACT:

An optimization of CdS chemical deposition process is presented in order to fabricate high quality CdS buffer layer for high-performance CIGS thin film solar cells. It is found that the heterogeneous and homogeneous reaction can be regulated conveniently by changing the concentration of cadmium acetate. No obvious large CdS particles on the surface of CdS film can be observed due to the dominant heterogeneous reaction and suppressed homogeneous precipitation under the suitable concentration of cadmium acetate. The device with CdS buffer layer deposited at 0.052 M cadmium acetate shows the best efficiency of 11.42%. The performance of the device can be further improved by post-annealing treatment in air. An improved champion efficiency of 12.57% is achieved at the annealing temperature of 180 °C.

Keywords: CdS buffer layer; Cu(In,Ga)Se₂; Raman; Annealing treatment; Thin films.

* Corresponding author. Tel & Fax: +86 0371 23881358

E-mail address: zld@henu.edu.cn (Z. L. Du)

Download English Version:

<https://daneshyari.com/en/article/5463785>

Download Persian Version:

<https://daneshyari.com/article/5463785>

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