

Accepted Manuscript

Influence of drying temperature on morphology of MAPbI₃ thin films and the performance of solar cells

Hao Zhang, Yalan Wang, Hong Wang, Meryang Ma, Shuai Dong, Qingyu Xu



PII: S0925-8388(18)33463-7

DOI: [10.1016/j.jallcom.2018.09.223](https://doi.org/10.1016/j.jallcom.2018.09.223)

Reference: JALCOM 47642

To appear in: *Journal of Alloys and Compounds*

Received Date: 13 June 2018

Revised Date: 14 September 2018

Accepted Date: 17 September 2018

Please cite this article as: H. Zhang, Y. Wang, H. Wang, M. Ma, S. Dong, Q. Xu, Influence of drying temperature on morphology of MAPbI₃ thin films and the performance of solar cells, *Journal of Alloys and Compounds* (2018), doi: <https://doi.org/10.1016/j.jallcom.2018.09.223>.

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.

Influence of drying temperature on morphology of MAPbI₃ thin films and the performance of solar cells

Hao Zhang¹, Yalan Wang¹, Hong Wang¹, Meryang Ma¹, Shuai Dong^{1,*}, and Qingyu

Xu^{1,2,*}

¹School of Physics, Southeast University, Nanjing 211189, China

²National Laboratory of Solid State Microstructures, Nanjing University, Nanjing 210093 China

*E-mail: sdong@seu.edu.cn (S. D.); xuqingyu@seu.edu.cn (Q. X.)

Abstract

Photoelectric conversion efficiency of organic-inorganic perovskite solar cells has been rapidly raised and attracted great attention in recent years. The quality of perovskite films is vital for the performance of devices. We used the anti-solvent method to prepare CH₃NH₃PbI₃ thin films by spin coating and dried them at various temperature to transform adduct MAI • PbI₂ • DMSO into CH₃NH₃PbI₃. We researched in detail on the relationship between surface morphology of MAPbI₃ thin films fabricated by the anti-solvent method and various drying temperature. We found that surface roughness and grain size of CH₃NH₃PbI₃ films together increased with increasing drying temperature. The larger grain size could efficiently reduce crystal boundaries which is advantageous for the suppression of photo-induced charge carrier recombination resulting in increase of FF. However, increase of surface roughness resulted in larger contact area at interface which might produce more trap states and

Download English Version:

<https://daneshyari.com/en/article/11020012>

Download Persian Version:

<https://daneshyari.com/article/11020012>

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