

Accepted Manuscript

Grain-boundary effect and post treatment of active layer for efficient inverted planar perovskite solar cells

Chunpeng Yang, Junyi Wang, Xichang Bao, Jun Gao, Zhiwen Liu, Renqiang Yang



PII: S0013-4686(18)31159-9

DOI: [10.1016/j.electacta.2018.05.114](https://doi.org/10.1016/j.electacta.2018.05.114)

Reference: EA 31900

To appear in: *Electrochimica Acta*

Received Date: 23 March 2018

Revised Date: 11 May 2018

Accepted Date: 16 May 2018

Please cite this article as: C. Yang, J. Wang, X. Bao, J. Gao, Z. Liu, R. Yang, Grain-boundary effect and post treatment of active layer for efficient inverted planar perovskite solar cells, *Electrochimica Acta* (2018), doi: 10.1016/j.electacta.2018.05.114.

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.

Grain-boundary effect and post treatment of active layer for efficient inverted planar perovskite solar cells

Chunpeng Yang^a, Junyi Wang^a, Xichang Bao^{*,a}, Jun Gao^a, Zhiwen Liu^b, and Renqiang Yang^a

^a Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences, Qingdao 266101, China.

^b Nanotechnology Measurement Operation, Keysight Technologies, China, Beijing 100102, China.

Corresponding author: baoxc@qibebt.ac.cn (X. Bao)

ABSTRACT: Organometal halide perovskite ($\text{CH}_3\text{NH}_3\text{PbI}_3$) solar cells with excellent photovoltaic performance have obtained great attention. In this work, conductive atomic force microscopy is used to investigate the conduction mechanism of perovskite film, and the results clearly show that grain boundaries are beneficial to the charge transport in perovskite solar cells. However, there are large gaps between grains in some as-prepared perovskite films, and the related grain boundaries or grains have poor charge transport capability, which leads to undesirable photovoltaic performance. After iso-propyl alcohol treatment, the charge transport capabilities of both grain boundaries and grains are improved. The power conversion efficiency of related device using PEDOT:PSS as hole transport material is increased from 13.72% to 15.65% with concurrently improved open circuit voltage, short circuit current density and fill factor. This research addresses that

Download English Version:

<https://daneshyari.com/en/article/6602302>

Download Persian Version:

<https://daneshyari.com/article/6602302>

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