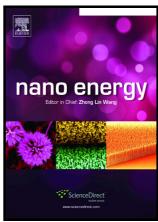
Author's Accepted Manuscript

One-Step Roll-to-Roll Air Processed High Efficiency Perovskite Solar Cells

Chuantian Zuo, Doojin Vak, Dechan Angmo, Liming Ding, Mei Gao



www.elsevier.com/locate/nanoenergy

PII: S2211-2855(18)30045-4

DOI: https://doi.org/10.1016/j.nanoen.2018.01.037

Reference: NANOEN2473

To appear in: Nano Energy

Received date: 8 December 2017 Revised date: 9 January 2018 Accepted date: 22 January 2018

Cite this article as: Chuantian Zuo, Doojin Vak, Dechan Angmo, Liming Ding and Mei Gao, One-Step Roll-to-Roll Air Processed High Efficiency Perovskite Solar Cells, *Nano Energy*, https://doi.org/10.1016/j.nanoen.2018.01.037

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 galley proof before it is published in its final citable 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.

ACCEPTED MANUSCRIPT

One-Step Roll-to-Roll Air Processed High Efficiency Perovskite Solar Cells

Chuantian Zuo^{a,b,c}, Doojin Vak^a, Dechan Angmo^a, Liming Ding^{b,c}*, and Mei Gao^a*

^aC. Zuo, Dr. D. Vak, Dr. D. Angmo, Dr. M. Gao

CSIRO Manufacturing, Bag 10, Clayton South, Victoria 3169, Australia

E-mail: Mei.Gao@csiro.au

^bC. Zuo, Prof. L. Ding

Center for Excellence in Nanoscience (CAS), Key Laboratory of Nanosystem and Hierarchical Fabrication (CAS), National Center for Nanoscience and Technology,

Beijing 100190, China

E-mail: ding@nanoctr.cn

^cC. Zuo, Prof. L. Ding

University of Chinese Academy of Sciences, Beijing 100049, China

Abstract:

The rapid improvement in power conversion efficiencies (PCE) to record high levels have highlighted perovskite solar cells' great potential to be commercialized in the near future. Continuous roll-to-roll (R2R) processing on flexible substrates enables ultra low-cost and high throughput manufacturing, which is essential for perovskite solar cells to make a breakthrough in cost per Watt compared to commercially established solar cells technologies. Here we demonstrate a facile spin-coating-free and R2R compatible blowing-assisted drop-casting (BADC) method to prepare CH₃NH₃PbI₃ films for perovskite solar cells. The crystallinity and morphology of CH₃NH₃PbI₃ films and device performance are significantly improved by optimization of the formulation with an NH₄Cl additive. The perovskite solar cell prepared in air with a maximum PCE of 19.48% is obtained using modified poly(3,4-ethylenedioxythiophene):polystyrene sulfonate (m-PEDOT:PSS) as the hole transport layer (HTL). The cells based the of on structure

Download English Version:

https://daneshyari.com/en/article/7952809

Download Persian Version:

https://daneshyari.com/article/7952809

<u>Daneshyari.com</u>