Short Communication

Organometal Halide Perovskite $\text{CH}_3\text{NH}_3\text{PbI}_3$ as an Effective Photosensitizer for p-Type Solar Cells

Jie Qu^{1,*}, Wenchang Wang¹, Jia Cheng², Shuai Zhang¹, Jianning Ding^{1,*}, Ningyi Yuan¹

¹ School of Materials Science and Engineering, Jiangsu Collaborative Innovation Center of Photovoltaic Science and Engineering and Jiangsu Province Cultivation base for State Key Laboratory of Photovoltaic Science and Technology, Changzhou University, Changzhou 213164, P. R. China

² Hunan Hua Teng Pharmaceutical Co., Ltd, Changsha 410205, P. R. China

* E-mail: qujie1981@cczu.edu.cn, dingjn@cczu.edu.cn

doi: 10.20964/2016.12.66

Received: 12 September 2016 / Accepted: 19 October 2016 / Published: 10 November 2016

$\text{CH}_3\text{NH}_3\text{PbI}_3$ sensitizers are prepared with different mixed solvents. Using butyrolactone/dimethyl sulphoxide mixed solvent, a smooth film with roughness of 12 nm is obtained. The prepared $\text{CH}_3\text{NH}_3\text{PbI}_3$ are used as photosensitizers of p-DSSC. Photoelectrical performance indicates that $\text{CH}_3\text{NH}_3\text{PbI}_3$ with butyrolactone/dimethyl sulphoxide presents a higher J_{sc} of 7.5 mA cm⁻² and a higher efficiency of 0.53%, which may contribute to its improved UV-vis absorption and smooth film. Researches further indicate that $\text{CH}_3\text{NH}_3\text{PbI}_3$ with butyrolactone/dimethyl sulphoxide provides fast hole transport, less recombination and improved hole collection efficiency.

Keywords: p-type solar cells; perovskite; photocathode; photoelectrical performance

[FULL TEXT](#)

© 2016 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).