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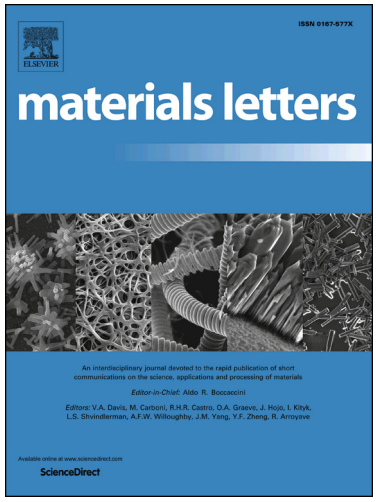

Single-step electrospray deposited nitrogen-doped ZnO nanosheets yield hysteresis-free perovskite solar cells

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PII: S0167-577X(18)30695-5
DOI: https://doi.org/10.1016/j.matlet.2018.04.092
Reference: MLBLUE 24259

To appear in: *Materials Letters*

Received Date: 23 March 2018
Revised Date: 20 April 2018
Accepted Date: 20 April 2018

Please cite this article as: K. Mahmood, A. Khalid, Single-step electrospray deposited nitrogen-doped ZnO nanosheets yield hysteresis-free perovskite solar cells, *Materials Letters* (2018), doi: https://doi.org/10.1016/j.matlet.2018.04.092

Single-step electrospray deposited nitrogen-doped ZnO nanosheets yield hysteresis-free perovskite solar cells

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Abstract

Electrospraying technique has been used for the one-step deposition of electron-rich nitrogen-doped ZnO (N-ZnO) nanosheets (NS,s) as a novel electron transporting layers (ETL,s) for highly efficient and hysteresis-free hybrid perovskite solar cells. The perovskite devices based on NZO NS,s demonstrate the average power conversion efficiency (PCE_{avg}) of 14.4% and the maximum power conversion efficiency (PCE_{max}) of 15.91%, owing to their better morphology, conductivity and optical transmittance which enhances the faster transfer of electrons and better infiltration of perovskite absorber into the oxide layer.

Keywords: Zinc oxide, Thin films, Solar energy materials, Energy storage and conversion

1. Introduction

Organolead-halide perovskite based solar cells (PSCs) have emerged as a most promising candidate for next generation photovoltaics because of their superb light-