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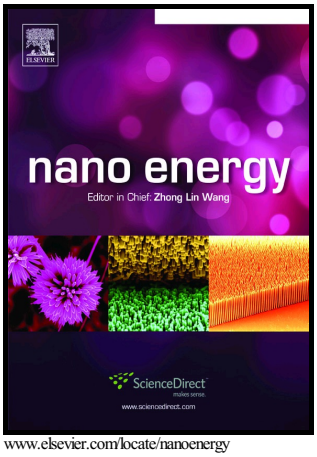

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Non-Halogenated Solvent-Processed Single-Junction Polymer Solar Cells with 9.91% Efficiency and Improved Photostability

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Abstract

High-efficiency bulk heterojunction (BHJ) polymer solar cells (PSCs) with power conversion efficiencies of 9.91% are achieved by using non-halogenated and environment-friendly solvent. To the best of our knowledge, it is the champion efficiency achieved by the random polymer based PSCs which are processed with all non-halogenated solvents. The photostability of the PSCs processed from halogenated solvent and non-halogenated solvent is intensively investigated by using grazing incidence wide-angle X-ray scattering (GIWAXS) combined with resonant soft X-ray scattering (R-SoXS) measurement, which is found to be efficient in monitoring the changes of the blend film morphology during irradiation. The results suggest that the crystallinity of the polymer as well as the domain purity of the blends with 1,8-diiodooctane (DIO) residual decrease dramatically in the illumination condition,

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