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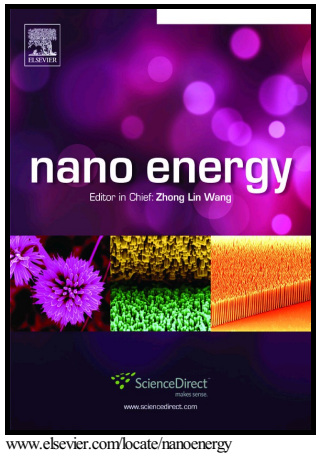

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Abstract

The recent rapid rise in power conversion efficiencies (PCEs) of perovskite solar cells (PSCs) has attracted worldwide extensive research. However, the PSC applications are limited by their poor stability due to perovskite degradation in moisture. We used a fullerene amine interlayer in planar PSCs to reduce the interface barrier between ETL and metal electrode and resist the moisture. The utilization of fullerene amine interlayer allowed for the enhancement of PSCs' performance, showing a highest power conversion efficiency (PCE) >17.2% with small hysteresis. More importantly, the air stability of PSCs with fullerene amine was improved: the unpackaged devices stored in air condition can keep their high performance with no obvious PCE loss in 10% humidity and >90% of the initial PCE in 45% humidity after 20 days.

Introduction

Organic metal halide perovskite solar cells (PSCs) have been intensively studied in recent years, whose power conversion efficiency (PCE) record has already reached more than