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Investigation of Inorganic electron–hole transport material for high efficiency, stable and low-cost perovskite solar cell

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Abstract

The low-cost inorganic materials, KFeO_2/ZnO , have been investigated as hole transport layer (HTL)/electron transport layer (ETL) and show better stability and high-power conversion efficiency for perovskite solar cell. Perovskite solar cells with two planar structures n-i-p and p-i-n have been fabricated using KFeO_2 and ZnO showing 12.81% and 10.83% power conversion efficiency, respectively. The stability for the perovskite solar cell has been tested at 30 °C with 40–45% relative humidity for 240 h. Time-resolved photoluminescence spectra revealed that decay time for n-i-p is higher than p-i-n. The mechanism for high stability and efficiency is discussed.