

Divalent Metal Doped Absorbing layers for Perovskite Solar Cells

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Abstract

Perovskite solar cells (PSC) having a unique crystal structure of ABX_3 (A-Monovalent Cation, B-Divalent Cation, X-Halogen anion) that provides good power conversion efficiency (PCE) in cost-effective photovoltaic. The main reason for its crucial role in today's photovoltaic is its rapidly increased PCE up to 22.1% within a few years. This highest PCE obtained by only using lead (Pb) as light absorbing material; although, chemical instability and environmental hazards of lead are still a big challenge. Stability can be improved by modifying the halogen ions (Cl-, Br- and I-) and exchanging divalent cation (CH_3NH_3I). Even the percentage of lead consumption in perovskite is low, but it causes more harm to the environment and also acts as a carcinogenic agent for humans due to its water solubility and chemical instability. In the path of lead-free perovskite solar cells, we made a try of doping divalent metals with the Pb as an absorbing layer and analysed. The absorbance of the active layer is analysed by UV-Visible spectrophotometer. X-Ray Diffractometer result confirms the structure of perovskite. I-V characteristics of fabricated PSC device have been analysed by Keithley Source Meter-2450.