

Effect of Methylammonium Lead Iodide Layer Thickness on Performance of Perovskite Solar Cell

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Abstract : The Methylammonium Lead Iodide $\text{CH}_3\text{NH}_3\text{PbI}_3$ is used in solar cell as an absorber layer since 2009. The efficiencies of these technologies have increased from 3.8% in 2009 to 29.15% in 2019. So, these technologies Methylammonium Lead Iodide is promising for the development of high-performance photovoltaic applications. Due to the high cost of the experimental of the solar cells, researchers have turned to other methods like numerical simulation. In this work, we evaluate and simulate the performance of a $\text{CH}_3\text{NH}_3\text{PbI}_3$ lead-based perovskite solar cell when the amount of materials of absorber layer is reduced. We show that the reducing of thickness the absorber layer influent on performance of the solar cell. For this study, the one-dimensional simulation program, SCAPS-1D, is used to investigate and analyze the performance of the perovskite solar cell. After optimization, maximum conversion efficiency was achieved with 300 nm in absorber layer.

Keywords : methylammonium lead Iodide, perovskite solar cell, characteristic J-V, efficiency

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