

Study of Hybrid Cells Based on Perovskite Materials Using Oghmasimulation

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Abstract : Due to its interesting optoelectronic properties, methylammonium perovskite $\text{CH}_3\text{NH}_3\text{PbI}_3$ is used as the active layer in the development of several solar cells. In this work, the hybrid (organic-inorganic) cell with the architecture FTO/pedotps/CH₃NH₃PbI₃/pcdtbt/Al is simulated using the Organic and Hybrid Material Nano Simulation Tool (OghmaNano). We studied the influence of certain parameters, such as thickness, on the characteristics of the solar cell. The effect of the device temperature was also investigated. The photovoltaic characteristic curves, such as current-voltage (j-V), are presented in this work. The optimized final parameters are $V_{oc} = 0.947$ V, $FF = 0.8034\%$, and $PCE = 23.16\%$.

Keywords : OghmaNano software, hybrid perovskite cell, $\text{CH}_3\text{NH}_3\text{PbI}_3$, conversion efficiency

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