

Development of Perovskite Structured Materials for Solar Cells

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Perovskite solar cells have drawn significant attention from the scientists and the industrialists because of the high efficiency. However, the fabrication of high quality film of perovskite material is a very difficult task. In this study methyl ammonium lead iodide perovskite ($\text{CH}_3\text{NH}_3\text{PbI}_3$) material was synthesized using two step spin coating method, first applying lead iodide (PbI_2) and then methyl ammonium iodide ($\text{CH}_3\text{NH}_3\text{I}$, MAI). Fabricated films were analyzed by X-Ray Diffraction (XRD) and Scanning Electron Microscope (SEM). It is confirmed that the methyl ammonium lead iodide ($\text{CH}_3\text{NH}_3\text{PbI}_3$) perovskite structured material with average crystal size of 550 nm was formed. The effect of morphological changes with the concentration of MAI was also studied. SEM images show the enhancement of the film quality with decreasing MAI concentrations. Maximum fill factor of 0.32 has been achieved with the lowest MAI concentration (0.1M).

Keywords: Perovskite, Solar cell, Morphology, Concentration, Fill factor