



Effects of Thermal Annealing Duration on the Film Morphology of Methylamine Lead Triiodide (MAPbI₃) Perovskite Thin Films in Ambient Air

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Abstract

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In the present communication we have studied the effect of thermal annealing duration on morphology of methylamine lead triiodide (MAPbI₃) perovskite (prepared using single step method) semiconductor that changes into lead iodide (PbI₂). Furthermore, the effect of annealing duration on thin films is investigated and correlated with its potential photovoltaic application. Thin films characteristics study by X-ray diffraction and scanning electron microscopy results indicate MAPbI₃ degraded strongly by annealing duration. However, thin films (about 1.25 micron-thick) annealed at 80 °C for 10 min in ambient conditions cause minimum degradation with smooth and uniform surface morphology. It also shows a higher absorption coefficient with the band gap of 1.5 eV rendering this perovskite suitable for practical applications.

Keywords: Ambient Air; Annealing Duration; Degradation; MAPbI₃; Perovskite; Thin Film