



3rd International Nanotechnology Conference & Expo

May 7-9, 2018 Rome, Italy

The Study of Perovskite Solar Cell with Solvent Substitution

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In this study, we developed a method to prepare a high-quality $\text{CH}_3\text{NH}_3\text{PbI}_3$ layer based on solvent (isopropanol) substitution. The difference between the IPA-substitution method with the two-step sequential coating method lies in the deposition of PbI_2 film via solvent IPA-substitution by us instead of a conventional anneal-treatment developed by others. First, we discussed the effects of IPA-substitution on the PbI_2 film morphology, crystallization, growth and device characteristics by Scanning Electron Microscope (SEM) and X-ray diffraction (XRD). Secondly, a PbI_2 -IPA nanostructure was endowed with affluent channels that are convenient for inserting $\text{CH}_3\text{NH}_3\text{I}$ and enhancing the complete conversion. As a result, the device achieved a high power conversion efficiency of 17.84% and exhibited high reproducibility.