

Discussion on Morphology and Efficiency of Perovskite Solar Cells by Dripping Amount of Toluene

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Since the discovery of perovskite solar cells (PSCs) that are cheap to manufacture and have a high efficiency, it is expected that PSCs will replace silicon solar cells in the near future. One method to achieve higher efficiency of PSCs is to produce a flat and uniform perovskite film. However, it is difficult to obtain such a film through typical processing methods, so a new process known as solvent engineering has recently emerged. This method allows us to be able to get a denser and more uniform perovskite film than ever before. Here, we have used this method to observe the changes in the morphology of the MAPbI₃ perovskite film and the efficiency of the PSCs by adjusting the dripping amount of toluene, a typical solvent used in solvent engineering. Also, we could determine the ideal amount required to fabricate the perovskite film with a certain morphology that displayed the highest efficiency. These results show the relationship between perovskite film morphology and perovskite device performance.