

Perovskite Solar Cell With Nanoimprinted Mesoporous TiO₂ thin film as Anti-Reflective Layer

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Perovskite solar cells have recently attracted as their high energy conversion efficiency, low-cost production, simple process such as solution techniques at low temperatures, and flexibility. The increasing light harvesting is the best way to improve the energy conversion efficiency of solar cells. However, it is difficult to adapt the light harvesting materials in perovskite solar cells because the device architectures are consist of thin film layers. Proper engineering of solar cell structure can improve the device performance. Here we used nanoimprint lithography technique to well-ordered nanoimprinted layer of mesoporous TiO₂ on blocking TiO₂/FTO substrate. The nanoimprinted layer resulted in ideal scattering characteristics for optimum light trapping. Compared to the plain layer of mesoporous TiO₂, the nanoimprinted-layers device yielded 14.24% increase of power conversion efficiency.