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Interface modification to elevate charge collection of carbon electrode based perovskite solar cell to improve conversion efficiency and stabilityChang Gung University¹, Advanced Energy Materials Lab.² (M2) Yu-ZheLiu^{1,2}, Kun-Mu Lee^{1,2}E-mail: kmlee@mail.cgu.edu.tw

Abstract

This study is through the carbon electrode perovskite solar cells (PSCs), which is cheap and has long-term stability. It has been considered to be practical and competitive in the future. The disadvantage is that the energy level mismatch and poor hole transmission at the interface between the carbon electrode and the perovskite make the performance of the battery element poor. In this study, we used spin coating of P3HT as an interface improvement application to improve the charge collection at the carbon electrode/perovskite layer. This is because the P3HT layer enables the carbon electrode to have a higher work function and better hole transmission capacity. However, P3HT causes defects in the parallel resistance, we further added copper phthalocyanine (CuPc) as the interface modification layer between the P3HT/perovskite. This perovskite solar cell has a power conversion efficiency of 12.63% under the irradiation of 100 mW/cm² simulated sunlight and shows a good stability under 65 °C thermal stress and continue illumination.

References

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