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Fabrication of P3HT/PCBM Inverted Solar Cells with ZnO electron transport layer

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ABSTRACT

Organic solar cells (OSCs) have gained much popularity among researchers as possible candidate for fulfilment of future energy requirements. P3HT:PCBM based bulk heterojunction OSC is one of the most popular types. In this study, inverted P3HT:PCBM OSCs were fabricated on Stainless Steel (SS) substrate with and without ZnO layer in between the SS and active material. In fabrication of the device ZnO and P3HT:PCBM layers were deposited using spin coating technique while PEDOT:PSS layer was deposited using doctor blade method. Finally, Au front contact was sputter coated. In comparison with the best SS/P3HT:PCBM/PEDOT:PSS/Au device, we could fabricate a SS/ZnO/P3HT:PCBM/PEDOT:PSS/Au device with a 280% increase in power conversion efficiency (PCE). This PCE enhancement is due to the improvement of short wavelength response with the introduction of ZnO to the device.

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