

Different Cathode Buffer Layers in Organic Solar Cells

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Abstract : Considerable progress has been made in the development of bulk-heterojunction organic solar cells (OSCs) based on a blend of p-type and n-type organic semiconductors. To optimize the interfacial properties between the active layer and the electrode, a cathode buffer layer (CBL) is introduced. This layer can reduce the leakage current, increasing the open-circuit voltage and the fill factor while improving the OSC stability. In this work, the performance of PM6:Y6 OSC with 1-Chloronaphthalene as an additive is examined. To accomplish this, three CBLs PNDIT-F3N-Br, ZrAcac, and PDINO, are compared using the conventional configuration. The device with PNDIT-F3N-Br as CBL exhibits the highest power conversion efficiency of 16.04%. The results demonstrate that modifying the cathode buffer layer is crucial for achieving high-performance OSCs.

Keywords : bulk heterojunction, cathode buffer layer, efficiency, organic solar cells

Conference Title : ICASEM 2020 : International Conference on Advances in Solar Energy Materials

Conference Location : London, United Kingdom

Conference Dates : December 10-11, 2020