

Low-temperature processable hybrid electron-collecting buffer layers for high efficiency polymer solar cells

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Charge-collecting buffer layers, which are a core component to transfer charges from the photoactive layers to corresponding electrodes, have been extensively studied for high efficiency organic solar cells. For inverted-type organic solar cells, electron-collecting buffer layers play a critical role because they should make good contacts with bottom electrodes as well as upper active layers. To date, zinc oxide (ZnO) have been widely employed as an ECBL via sol-gel processes but the precursor layers should be subjected to high temperature annealing processes for reasonable performances. Recently, ZnO nanoparticles have been directly coated but the resulting film quality is still one of the main issues. Our group has recently invented a particular hybrid ECBL, which consists of ZnO and polymers, featuring a nano-crater structure and enabling low temperature processes. In this presentation, we will discuss hybrid ECBLs for high efficiency polymer:nonfullerene solar cells.