

PEDOT Engineering for Organic Electronics

박종혁†

연세대학교

(lutts@yonsei.ac.kr†)

Even though poly(3,4-ethylenedioxythiophene):poly(styrenesulfonate) (PEDOT:PSS) has been commonly used as a hole extraction layer (HEL) for p-i-n perovskite solar cells (PSCs), the cells' photovoltaic performance deteriorates because of the low and unstable work functions (WFs) of PEDOT:PSS versus those of a perovskite layer. To overcome this drawback, we synthesized a copolymer (PSS-co-TFPMA) ionomer consisting of PSS and tetrafluoropropylmethacrylate (TFPMA) as an alternative to conventional PEDOT:PSS. The PEDOT:PSS-co-TFPMA copolymer solution and its film exhibited excellent homogeneity and high phase stability compared with a physical mixture of TFPMA with PEDOT:PSS solution. During spin coating, a self-organized conducting PEDOT:PSS-co-TFPMA HEL evolved, and the topmost PEDOT:PSS-co-TFPMA film showed a hydrophobic surface with a higher WF compared with that of the pristine PEDOT:PSS film because of its chemically bonded electron-withdrawing fluorinated functional groups.