

## Study of the Energy Level Alignment of Organic Materials' Planar Junction Prepared by Electro spray Vacuum Deposition

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We investigated the energy levels of valence region at the planar junction of poly (3-hexylthiophene) (P3HT) and C61-butyric acid methylester (PCBM) using ultraviolet photoemission spectroscopy (UPS) with ultra high vacuum. These are the most widely used materials for bulk heterojunction (BHJ) organic solar cells due to their high efficiency. In order to make the planar junction, we carried out the electro spray vacuum deposition (EVD) of PCBM onto spin-coated P3HT in high vacuum conditions ( $\sim 10^{-5} - 10^{-6}$ ). The planar junction interface exhibited 0.71 eV for the offset between P3HT HOMO and PCBM LUMO, which is different from the gap (0.85 eV) of individual values and is closer to the open circuit voltage of solar cells fabricated with the same material combination.

**Keywords:** UPS, organic solarcell, opencircuit voltage, P3HT, PCBM