

## **Abstract**

The effects of boron and nitrogen-doped carbon nanotubes (B- or N-CNTs) have been investigated as photoactive and charge extracting layer in bulk heterojunction organic solar cell composed of poly(3-hexylthiophene) [P3HT] and 1(3-methoxycarbonyl)propyl-1-phenyl-[6,6] C61 (PCBM). Two types of device configurations were employed by casting the doped CNTs close to either the hole or electron collecting electrodes next to a film of P3HT:PCBM blend. The electrical properties of OPV devices measured under standard 1.5 AM illumination suggest that those devices with B-CNTs layer close to the hole collecting electrode improved by 141 % while the devices with N-CNTs layer next to electron collecting electrode improved only by 38 %. The results are attributed to enhanced charge carrier's transfer to the electrodes by reducing recombination at the interfaces. The doped CNTs layer near the photoactive medium of OPV is found to enhance device performance compared to the incorporation of CNTs in P3HT:PCBM blend.