

Abstract Submitted
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Improvement of the polymer composite: ZnO-nanocolumn solar cell performance through surface modification¹ FANG-CHI HSU, National United University, CHIANG-TING CHEN, National Taiwan University, SHANG-WEI KUAN, National United University, WEI-FANG SU, YANG-FANG CHEN, National Taiwan University — Incorporating ordered inorganic nanostructures into polymer matrix has been considered as one of the methods to improve the charge collection efficiency of the photogenerated carriers. However, the surface states of the inorganic nanostructure could serve as the charge trapping center for free carriers. We use a conductive ligand, amine terminated 3-hexylthiophene (oligomer 3HT-NH₂), to modify the surface of ZnO-nanocolumn embedded in poly(3-hexylthiophene)/(6,6)-phenyl C₆₁ butyric acid methyl ester (P3HT/PCBM) composite. We found that the addition of oligomer 3HT-HH₂ ligand layer between the polymer composite and the ZnO-nanocolumn structures improves the short circuit current (J_{SC}) and open circuit voltage (V_{OC}) of the devices resulting in a 25% increment in the power conversion efficiency before device optimization.

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