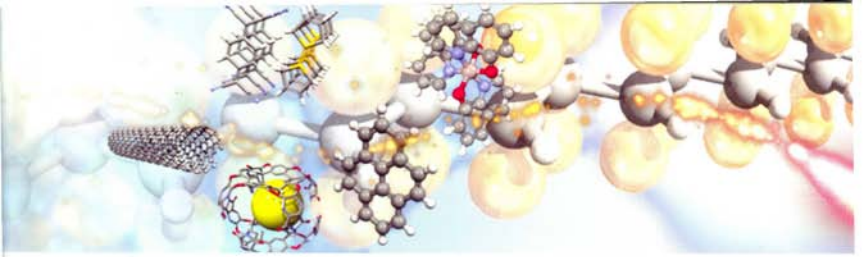

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Nanoscale Optical Properties of Hybrid Nanoparticles of P3HT and PCBM

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Poly (3-hexylthiophene) (P3HT) and [6,6]-phenyl C_{61} butyric acid methyl ester (PCBM) hybrid nanoparticles (NPs) were fabricated by using mini-emulsion method. Through SEM, TEM and AFM images, we studied the surface morphology of P3HT/PCBM hybrid NPs. The radius of P3HT/PCBM hybrid NPs was 25~50 nm. Structural characteristics of the hybrid NPs were investigated through micro Raman, FT-IR and UV/Vis absorbance spectra. The nanoscale photoluminescence (PL) characteristics of the P3HT/PCBM hybrid NPs as a function of concentrations of the PCBM were measured by using a laser confocal microscope. As the concentration of PCBM material increased, the PL peaks of the hybrid NPs were blue-shift. The optoelectronic properties of the organic solar cells using P3HT/PCBM hybrid NPs are also presented.