

This work studies various properties of polymer layers and hybrid layers containing inorganic nanoparticles. MEH-PPV and Polythiophene films are characterized by different experimental techniques. Dark J-V characteristics were measured at different temperatures and the mobility of holes was evaluated in a few cases. Photovoltage spectra are used for a determination of the exciton diffusion length and the SPV method is discussed. The influence of the inorganic nanoparticles CdS and ZnO incorporated into the polymer layers is studied by various experimental methods and the applications of these layers in the inorganic-organic hybrid solar cells are discussed. The inorganic nanoparticle size distributions are obtained by several experimental techniques and the results correspond with the assumptions.