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Electric Transport Phenomena of Nanocomposite Organic Polymer Thin Films[1] NICHOLAS C. JIRA, ILDAR SABIRIANOV, CAROLINA C. ILIE, SUNY Oswego — We discuss herein the nanocomposite organic thin film diodes for the use of plasmonic solar cells. This experimental work follows the theoretical calculations done for plasmonic solar cells using the MNPBEM toolbox for MatLab. These calculations include dispersion curves and amount of light scattering cross sections for different metallic nanoparticles. This study gives us clear ideas on what to expect from different metals, allowing us to make the best choice on what to use to obtain the best results. One specific technique for light trapping in thin films solar cells utilizes metal nanoparticles on the surface of the semiconductor. The characteristics of the metal, semiconductor interface allows for light to be guided in between them causing it to be scattered, allowing for more chances of absorption. The samples were fabricated using organic thin films made from polymers and metallic nanoparticles, more specifically Poly(1-vinylpyrrolidone-co-2-dimethylaminoethyl methacrylate) copolymer and silver or gold nanoparticles. The two fabrication methods applied include spin coating and Langmuir-Blodgett technique. The transport properties are obtained by analyzing the I-V curves. We will also discuss the resistance, resistivity, conductance, density of charge carriers.

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