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Characterization of Inverted Polymer Bulk Heterojunction Solar Cells TYLER CARNEY, MARIAN TZOLOV, Department of Physics, Lock Haven University — Inverted solar cells were proven to be an improvement over polymer solar cells in terms of durability and reliability. We have fabricated the solar cells using P3HT and PCPDTBT as the active polymer with PC60BM as the electron acceptor. The materials we deposited from solution by spin coating on glass substrates with ITO film. Molybdenum oxide was thermally evaporated overtop the spin coated polymer solar cell to realize the inverted design. The devices were finalized by thermally evaporated aluminum contacts which were then mechanically reinforced with silver paste. Current voltage characteristics were performed both in dark and under illumination to characterize the inverted solar cells and to verify the inverted solar cell design. Impedance spectroscopy in dark and under illumination were used to gain more information about the photoelectric processes in the devices and to build a realistic equivalent circuit model of the inverted solar cells. The inverted solar cells were then compared against standard polymer bulk heterojunction solar cells produced with the same active materials.

Tyler Carney
Department of Physics, Lock Haven University

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