

Abstract Submitted
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Charge Carrier Lifetime in Poly(3-hexylthiophe)/ZnO Nanowire Array Based Photovoltaic Devices LEE BUTLER, WILLIAM BAUGHMAN, SHAWN DAVID WILBERT, NICK HARRIS, GANG SHEN, NABIL DAWAHRE, JOSEPH BREWER, PATRICK KUNG, SEONGSIN MARGARET KIM, The University of Alabama — Nanostructured electron donor and acceptor materials have shown potential for greatly improving the efficiency of organic photovoltaic (OPV) devices. Inorganic hybrid OPVs utilizing nanowires, nanorods and nanoparticles have been shown to greatly increase the current through P3HT based devices but have yet to achieve the efficiencies of their corresponding bulk-heterojunction OPVs. Determining the carrier properties and interface structure of these hybrid devices could greatly aid in determining limitation of the device structure on the overall efficiency. Here we report the use of terahertz, micro-Raman and micro-photoluminescence spectroscopy in determining carrier lifetime and optical properties of P3HT/ZnO based OPV devices. We will also discuss the effects of surface functionalization on the available phonon modes, carrier lifetimes and absorption properties.

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