Abstract Submitted
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**Correlation Between Optical Properties and Charge Carrier Mobility in Regioregular Poly (3-hexylthiophene) Thin Films**[1] AARON MEBANE, Univ of Dallas, XIN XU, SEOHEE KIM, ANANTH DODABALAPUR, University of Texas at Austin — The ability to efficiently and accurately determine the charge carrier mobility (CCM) in poly (3-hexylthiophene-2,5-diyl) (P3HT) thin films is important for measurements of quality in P3HT based electronic devices. P3HT is an important semiconducting organic polymer that is one of the leading candidates for use in organic thin-film and, flexible electronics. CCM is routinely determined using methods such as field effect mobility measurements; however, this requires the devices fabrication to be completed in addition to a process of probing the device for current vs voltage readings. Because of these requirements a non-contact optical method was investigated to efficiently predict the CCM of P3HT thin films. Ellipsometric methods were used to examine the anisotropic nature of P3HT with a goal of determining the overall order of the polymer chains in the film and thereby predicting CCM. Results indicate that P3HT chains easily adopt a preferred order in the film, that charge transport is two dimensional, and that annealing temperature does not affect the anisotropic nature of P3HT but does increase the size of the crystallites. These findings will be discussed in detail.

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