

Abstract Submitted  
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**Single Molecule Studies of Anthradithiophene Derivatives** W.E.B. SHEPHERD, A.D. PLATT, G. BANTON, Oregon State University, M.A. LOTH, J. ANTHONY, University of Kentucky, O. OSTROVERKHOVA, Oregon State University — Several solution-processable anthradithiophene (ADT) derivatives have been developed which exhibit charge carrier mobilities of  $> 1 \frac{cm^2}{Vs}$  in films. To better understand charge transport and energy transfer processes in these materials at the molecular level, we apply single-molecule fluorescence spectroscopy (SMFS) techniques to probe effects of intermolecular interactions and external parameters on the molecular properties. In particular, we demonstrate that ADT molecules exhibit high enough quantum yields and photostability to be imaged on a single-molecule level at room temperature. Moreover, we show that the behavior of individual ADT molecules depends on the host matrix (poly (methyl methacrylate) vs a crystalline environment) and is comparable to that of the best fluorophores utilized in SMFS. Finally, we analyze performance of individual ADT molecules depending on their local nanoenvironment (which includes arrangement of the surrounding host molecules and the presence of other guest molecules in the vicinity of the molecule under study).

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