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The Effect of a Nematic Liquid Crystal Environment on the Alignment of the Conductive polymer MEH-PPV as a Function of Polymer Chain Length DAVID SOLIS, University of Dallas, ALEXEI TCHERNIAK, Rice University, ANDREW TANGONAN, T. RANDALL LEE, University of Houston, STEPHAN LINK, Rice University, UNIVERSITY OF HOUSTON RANDALL LEE GROUP COLLABORATION — MEH-PPV (poly(2-methoxy, 5 ethyl (2' hexyloxy) para-phenylene vinylene)) is a conductive, highly fluorescent polymer that has important technological applications in photovoltaic devices such as organic solar cells and light emitting diodes. It is known that the polymer conformation can be controlled through the environment in which it is present. By using a nematic liquid crystal solvent, 5CB (4-pentyl-4'-cyanobiphenyl) as a host for the MEH-PPV, we are able to stretch and align the polymer chains along the liquid crystal director to a much greater extent than it is possible in an isotropic solvent. We use single molecule polarization spectroscopy to determine the solute order parameter for the MEH-PPV – 5CB solute-solvent system. Using MEH-PPV samples with different molecular weights, we are able to investigate the dependence of the solute order parameter on the polymer chain length. We observe a decrease in order parameter for shorter polymer chains with the solute order parameter equaling that of the solvent for a single molecule solute (rhodamine 6G).

Richard Olenick
University of Dallas

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