Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Influence of Light Absorption on the Chain Conformation of Conjugated Polymers BRIAN MORGAN, MARK DADMUN, University of Tennessee Knoxville - Chemistry — The interaction of conjugated polymers with light leads to the creation of electron-hole pairs (exciton) through photo-excitation of the electron. As these entities travel along and across polymer chains, their potential effects on chain conformation, and ultimately macroscopic physical properties, is largely unstudied. Recently, Reiter et al. have demonstrated that the absorption of photons by a conjugated polymer reversibly decreases the rate of dewetting in polystyrene/conjugated polymer thin film blends. To investigate the cause of this phenomenon, we have completed small angle neutron scattering experiments to determine the configuration of several semiconducting conjugated polymers in solution in both the presence and absence of light. Substantial differences are observed in the measured structure factor of the chain with illumination. The extent of the differences varies with polymer concentration, solvent choice, and light exposure methodology. Analysis of the neutron scattering curves points towards significant change in conjugated polymer conformation as a result of its absorption of photons.

Brian Morgan
University of Tennessee Knoxville - Chemistry

Date submitted: 15 Nov 2013 Electronic form version 1.4