Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Changes in the Solution Behavior of Conjugated Polymers with Light Absorption MARK DADMUN, BRIAN MORGAN, University of Tennessee — Conjugated polymers are well established as functional materials in a broad range of applications including organic photovoltaics, chemical sensors, and organic light emitting diodes. This functionality is mainly derived from their ability to create electron-hole pair excitons through photoexcitation. The presence of these entities on the polymer chains may alter the chain conformation, solution behavior, and ultimately macroscopic morphology, of the conjugated polymer. Previous studies have shown significant changes in properties such as viscosity and photoluminescence upon exposure of select conjugated polymer films to white light. In order to expand upon these preliminary findings, we have performed small angle neutron scattering experiments on solutions of several semiconducting, conjugated polymers in both the presence and absence of incident light. Substantial differences are observed between the light vs dark samples, the magnitude of which are dependent on polymer dispersion, solvent choice, and solution concentration. Analysis of the neutron curves shows real difference in Kuhn lengths and radius of gyration of the polymer, suggesting possible rearrangement of polymer chain conformation or alteration of polymer chain-solvent interactions.

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Date submitted: 13 Nov 2014 Electronic form version 1.4