Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Stark Spectroscopy of Conjugated Oligomers and Polymers Important for Organic Devices ALBERTO MOSCATELLI, DAVID C. COPPOCK, LINDA A. PETEANU, Carnegie Mellon University — Fluorescent conjugated polymers have attracted a great deal of attention among scientists and engineers for their potential use in opto-electronic devices. One of the points that remain to be fully understood, however, is the undesirable sensitivity of their charge transport efficiency and emission characteristics on variations of the polymer structure and morphology. Using Stark spectroscopy it is possible to measure directly two important photophysical molecular parameters: (i) the change in the dipole moment, which is related to the degree of charge transfer associated with an optical transition; and (ii) the change in polarizability, which is related to the extent of the electronic delocalization. Poly(phenylenevinylene) (PPV), poly(dialkylfluorene) (PDAF) and ladder-type polyphenylenes (LPPP), as well as related oligomers, have been tested using this approach. Comparison of the results from single chains and from aggregates reveal how intermolecular interactions impact charge transfer and electronic delocalization in these technologically-important systems.

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Date submitted: 22 Nov 2008 Electronic form version 1.4