

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Evaporative Self-Assembly and Formation of the Lyotropic Liquid Crystalline Phase of Poly(3-hexyl thiophene)**<sup>1</sup> MIN SANG PARK, AVISHEK AIYAR, JUNG OK PARK, ELSA REICHMANIS, MOHAN SRINIVASARAO, Georgia Institute of Technology — In this study, we electrically and optically interrogated the evolution of the thin film structure in conjugated systems using poly(3-hexylthiophene) (P3HT) as a model semiconducting polymer. In an effort to understand the electrical properties of the conducting channel in terms of polymer chain orientation and relaxation in solution, we performed in-situ micro-Raman measurements using polarized incident light. We measured the extent of molecular chain alignment during the process of film formation and showed the existence of a lyotropic liquid crystal phase at the three-phase contact line. The variation of frequency dispersion and the shift of position for Raman active mode, combined with the structural anisotropy of P3HT films, suggest a phase transition to the lyotropic liquid crystalline phase. The orientational order of P3HT chains in the liquid crystalline phase was quantified as a function of evaporation time using solidified solvent, 1,3,5-trichlorobenzene (1,3,5-TCB).

<sup>1</sup>This work was supported, in part, by the Office of Basic Energy Science, Department of Energy, Grant No. DESC0001412 and by an NSF, Grant No. DMR0706235.

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Date submitted: 27 Nov 2010

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