Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Controlling the Thermal and Optoelectronic Properties in Poly(3-alkylthiophene) Random Copolymers VICTOR HO, HOI NG, RACHEL SEGALMAN, University of California, Berkeley — Although thermal annealing is a common technique for changing the crystalline texture of polymer-based active layers, the high thermal transition temperatures of many conjugated polymers, such as poly(3-alkylthiophenes) (P3ATs), prevents precise control over the morphology and optoelectronic properties studied at room temperature. In the past we have shown that substitution of the aliphatic side chain is an effective method to alter thermal transitions over a range of 150C while still retaining similar crystalline texture in homopolymer thin films. In this talk random copolymerization of P3ATs results in cocrystallization of repeat units over all the entire range of compositions into unit cells which are related to one of the two parent homopolymers. In turn, the optical absorption edge closely matches that of either of the two homopolymers while the melting temperatures gradually transition between that of the pure components. This presents a synthetically convenient approach to controlling the melting transition of conjugated polymers without detrimentally affecting the optical absorption.

Victor Ho
University of California, Berkeley

Date submitted: 12 Nov 2013 Electronic form version 1.4