Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Magnetic Field Alignment of Rod-Coil Block Copolymers and Identification of Liquid Crystalline Orientation X. GU, University of California, Berkeley, B.D. OLSEN, A. HEXEMER, E. GANN, R.A. SEGALMAN, UC BERKELEY TEAM, LAWRENCE BERKELEY LABS TEAM — Conjugated rod-coil block copolymers are potentially useful for a number of optoelectronics applications, but properties rely strongly on the orientation of both the conjugated rods and of the nanodomains. Here, a magnetic field was used to control the self-assembly of a model conjugated rod-coil block copolymer (poly(alkoxyphenylenevinylene-b-isoprene) such that the rods align with the field direction. After alignment, the samples were re-annealed below the microphase order-disorder transition temperature to allow equilibration of the rod orientation within the lamellar nanodomains. Small angle and wide angle X-ray scattering simultaneously determine the rod tilt relative to the lamellar normal. Rods were found to be parallel to the lamellar normal for coil fractions of 42-85 percent at all temperatures below the microphase order-disorder transition temperature. The orientation of the rod blocks in rod-coil block copolymers impacts carrier transport and optical properties in organic electronic devices, making the control of rod orientation necessary for device optimization.

Xun Gu
University of California, Berkeley

Date submitted: 20 Nov 2008 Electronic form version 1.4