

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Confined Discotic Liquid Crystalline Self-Assembly in a Novel Coil-Coil-Disk Triblock Oligomer¹ LI CUI, JIANJUN MIAO, LEI ZHU, Polymer Program, Institute of Materials Science and Department of Chemical Engineering, The University of Connecticut, Storrs, CT 06269-3136, IGORS SICS, BENJAMIN HSIAO, Chemistry Department, State University of New York at Stony Brook, Stony Brook, NY 11794-3400 — An asymmetric ABC coil-coil-disk triblock oligomer, based on polyethylene-*block*-poly(ethylene oxide)-*block*-pentakis(pentyloxy)triphenylene (PE-*b*-PEO-*b*-P5T or EEO-P5T), was successfully synthesized by coupling a hydroxyl group terminated PE-*b*-PEO diblock oligomer and 2-hydroxy-3,6,7,10,11-pentakis(pentyloxy)triphenylene using oxalyl chloride. The structure and morphology of supramolecular self-assembly in bulk EEO-P5T was studied by small- and wide-angle X-ray scatterings and transmission electron microscopy. The PE block was found to crystallize into interdigitated, extended chain crystals with a chain-tilting angle of 23° from the lamellar normal, where their melting temperature (T_m) was at 93.8° C. The PEO block remained in the amorphous state because both its ends were tethered to other two blocks. Bilayer P5Ts, sandwiched between amorphous PEO layers, exhibited a nematic columnar (N_{col}) to nematic discotic (N_D) transition at *ca.* 23° C. Intriguingly, the N_D to isotropic (or *vice versa*) transition was observed to coincide with the melting (or crystallization) of the PE block.

¹This work was supported by NSF CAREER award DMR-0348724.

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Date submitted: 23 Nov 2004

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