Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Self-assembly of rod-coil block copolymers from weakly to moderately segregated regimes RAFFAELE MEZZENGA, NICOLAS SARY, University of Fribourg, Physics Department, GEORGES HADZIIOANNOU, CYRIL BROCHON, University Louis Pasteur, France — We report on the self-assembly behaviour of two homologue series of rod-coil block copolymers in which, the rod, a π-conjugated polymer, is maintained fixed in size and chemical structure, while the coil is allowed to vary both in molecular weight and chemical nature. This allows maintaining constant the liquid crystalline interactions, expressed by Maier-Saupe interactions, ω, while varying the tendency towards microphase separation, expressed by the product between the Flory-Huggins parameter and the total polymerization degree, χN. Therefore, the systems presented here allow testing directly some of the theoretical predictions for the self-assembly of rod-coil block copolymers in weakly segregated regime. The two rod-coil block copolymer systems investigated, were poly(DEH-p-phenylenevinylene-b-styrene), whose self-assembly takes place in the very weakly segregated regime, and (DEH-p-phenylenevinylene-b-4vinylpyridine), for which self-assembly behaviour happens under increased tendency towards microphase separation, hereby refereed as moderately segregated regime. Experimental results for both systems are compared with predictions based on Landau expansion theories.

Raffaele Mezzenga
University of Fribourg, Physics Department

Date submitted: 02 Dec 2007 Electronic form version 1.4