Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Collapse Transitions in Thermosensitive Alternating Copolymers: A Monte Carlo Study IOANNIS BITSANIS, ANASTASIA RISSANOU, FORTH-IESL, Heraklion, Greece, STANISLAV BUROV, St. Petersburgh Univ., Russia, EVEANGELOS MANIAS, Penn State Univ., PA USA — Alternating copolymers are expected to exhibit a rich transition behavior in selective solvents with implications in biology and the design of thermo and pH-sensitive materials. We studied transitions of model alternating copolymers of the type (AAA...)n1(BBB...)n2, in selective solvents by MC simulations. Results showed that the eminent factor, controlling response to external stimuli, is co-polymer's chemical composition.. We focused on the extreme case of a single polymer chain of N = 1000 units, distributed equally in alternate blocks of n1= n2 =100 units (A- and B- blocks). The solvent was quite selective, i.e. good for 5 100-A-blocks, whereas the 5 100 B-blocks were quite insoluble. An extended critical region, characterized by the presence of several distinct intermediate states between coil and globules, and by fluctuations strong enough to induce spontaneous transitions among these states was observed. Our findings underline that in the case of strong blockiness the alternating architecture induces collapse transitions that proceed through stages not existing in the analogous homopolymer and di-block copolymer transitions. GSRT-05-MAT-USA- 14; INTASDMR-0602877; NSF-DMR-0602877; INTAS 05-1000008-8020.

Ioannis Bitsanis

Date submitted: 07 Dec 2008 Electronic form version 1.4