Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Phase Behavior of poly(2-vinyl pyridine)-*block*-poly(4-vinyl pridine) Copolymers SUNG HYUN HAN, DONG HYUN LEE, JIN KON KIM, Pohang Univ of Science and Technology — Phase behavior of a block copolymer depends on the volume fraction (f) of one block, total degree of polymerization (N), and the segmental interaction parameter (χ). Recently, we found that the order-to-disorder transition temperature (T_{ODT}) of polystyrene-*block*-poly(2-vinylpridine) copolymer (PS-P2VP) was much lower than that of PS-*block*-poly(4-vinylpridine) copolymer (PS-P4VP) at similar values of f and N. The only difference between PS-P2VP and PS-P4VP is the different location of the nitrogen group in phenyl ring (2 versus 4-position). In this study, we studied, via small angle X-ray scattering (SAXS), rheometry, and birefringence, the phase behavior P2VP-*block*-P4VP copolymers (P2VP-P4VP) with various f and N. We determined the temperature dependence of χ between P2VP and P4VP from SAXS profiles in the disordered states with the aid of the random phase approximation. We found that the value of χ between P2VP and P4VP was relatively large. For instance, it is larger than χ between PS and P2VP. Thus, even when the molecular weight of symmetric P2VP-P4VP is ca. 12000, the T_{ODT} is larger than 280 ^{o}C. This work was supported by Creative Research Initiative Program supported by KOSEF

Jin Kon Kim
Pohang Univ of Science and Technology

Date submitted: 16 Nov 2006 Electronic form version 1.4