Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Characterization of interactions in weakly interacting block copolymer by two-dimensional heterospectral analysis of WAXS and FTIR[1] HYE JEONG KIM, JIN KON KIM, Pohang Univ of Science and Technology, YOUNG MEE JUNG, Kangwon University, SEUNG BIN KIM, Pohang Univ of Science and Technology — We investigated, via 2D hetero-spectral correlation analysis of wide angle X-ray scattering (WAXS) and infrared (IR) spectroscopy, the specific chemical interactions existing in polystyrene-block-poly(n-pentyl methacrylate) copolymer (PS- PnPMA). The specific interaction between PS and PnPMA block is mainly arising from the dipole in the benzene ring of PS and the induced dipole in the PnPMA due to the cluster formation with a size of 1∼2 nm. We found that the synchronous 2D WAXS-IR spectrum of the ordered state was completely different from that in the two disordered states. The CH group of the main chains of PS and PnPMA did not contribute to the cluster formation in the two disordered states, indicating that the main chains of PS and PnPMA blocks were uniformly distributed in the two disordered states. However, only the C=C group in the PS block contributed to the cluster at a disordered state below the LDOT, whereas both the C-C-O group in PnPMA and the entire phenyl ring as well as the C=C group in PS contributed to cluster formation at another disordered state above the UODT.

[1]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