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Resonant soft x-ray GISAXS on block copolymer films CHENG WANG, T. ARAKI, B. WATTS, H. ADE, NCSU, A. HEXEMER, LBNL, S. PARK, T.P. RUSSELL, UMass, W.F. SCHLOTTER, SSRL, G.E. STEIN, C. TANG, E.J. KRAMER, UCSB — Ordered block copolymer thin films may have important applications in modern device fabrication. Current characterization methods such as conventional GISAXS have fixed electron density contrast that can be overwhelmed by surface scattering. However, soft x-rays have longer wavelength, energy dependent contrast and tunable penetration, making resonant GISAXS a very promising tool for probing nanostructured polymer thin films. Our preliminary investigation was performed using PS-*b*-P2VP block copolymer films on beam-line 5-2 SSRL, and beam-line 6.3.2 at ALS, LBNL. The contrast/sensitivity of the scattering pattern varies significantly with photon energy close to the C K-edge (~ 290 eV). Also, higher order peaks are readily observed, indicating hexagonal packing structure in the sample. Comparing to the hard x-ray GISAXS data of the same system, it is clear that resonant GISAXS has richer data and better resolution. Beyond the results on the A-B diblock copolymers, results on ABC block copolymers are especially interesting.

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