Soft X-ray Reflectivity for DSA BCP Characterization

Daniel F. Sunday¹, Michael Maher², Summer Tein³, Gregory Blachut², Yusuuee Asano³, C. Grant Willson², Chris Ellison³, R. Joseph Klíne¹

1. Materials Science and Engineering Division, National Institute of Standards and Technology, Gaithersburg, MD
2. Department of Chemistry, University of Texas, Austin, TX
3. McKetta Department of Chemical Engineering, University of Texas, Austin, TX

Reducing BCP Interface Width Through Polymer Blends

The addition of a selectively associating additive to a BCP can raise the effective χ between the two phases. Using soft X-ray reflectivity we investigate the distribution of PVPH throughout PS-b-PMMA and how it impacts the interfacial width between blocks.


Relating Topcoat-Polymer Interface Width to Preferentiality

Higher χ BCPs generally want to orient parallel to the surface, due to uneven surface energies. Top coats can be used to control the orientation of the BCP. The interface width between the polymer and the topcoat can be related to the neutrality condition which leads to perpendicular orientation.


Measuring the Profile of High χ BCPs

New high χ polymers enable BCPs to reach sub 10-nm pitches. Reflectivity enables the characterization of the interface width and the extent of segregation.

Higher χN leads to reduced interface width and increased segregated.