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Effects of deuterium labeling at PS/PMMA interfaces studied with resonant soft x-ray reflectivity H. ADE, C. WANG, S. E. HARTON, B. WATTS, T. ARAKI, NCSU — The interfacial widths of PS/PMMA and deuterated-PS/PMMA bilayer interfaces were analyzed using resonant soft x-ray reflectivity (RSoXR). The PS and dPS utilized had the same molecular weight and polydispersity. Identical sample preparation and film thicknesses were used, respectively. The PS/PMMA bilayer width was consistently smaller than the dPS/PMMA width for a number of different thickness combinations. This is unexpected, based on previously reported bulk Flory-Huggins parameters for PS/PMMA and dPS/PMMA, respectively. Based on these bulk values, self consistent field theory asserts that the width of a PS/PMMA interface would be greater than that of a dPS/PMMA interface. In contrast, Harton *et al.* [1] have recently reported the strong preferential segregation of dPS to a dPS:PS/PMMA interface. The RSoXR results are qualitatively consistent with the results of Harton *et al* and confirm that the thermodynamic properties of PS/PMMA interfaces are substantially different from the properties in the bulk. [1] S. E. Harton *et al.*, Macromolecules **39**, 1639 (2006).

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