

Segment Distributions of Deuterated Short Diblock in Binary Blends of Block Copolymers Having Secondary Bonding

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A binary mixture of two block copolymers whose blocks are capable of forming the hydrogen bonding allows one to obtain various microdomains that could not be expected for neat block copolymer. For instance, we reported that the binary blend of symmetric polystyrene-*block*-poly(2-vinylpyridine) copolymer (PS-*b*-P2VP) and polystyrene-*block*-polyhydroxystyrene copolymer (PS-*b*-PHS) blends where the hydrogen bonding occurred between P2VP and PHS showed hexagonally packed (HEX) cylindrical and body centered cubic (BCC) spherical microdomains. To explain the unexpected results, one should investigate the exact location of short block copolymer chains in the interface. For this purpose, we synthesized deuterated polystyrene-*block*-polyhydroxystyrene copolymer (d-PS-*b*-PHS) and prepared a binary mixture with PS-*b*-P2VP. Through SAXS and neutron reflectivity (NR), the exact location of shorter dPS block in the mixture near the interface of the microdomains was investigated.