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Thin film Phase behavior and domain spacing of binary and ternary homopolymer/block copolymer (BCP) blends. MD FAKAR UDDIN, BARAKA S. LWOYA, AMY GOODSON, AMIRA MUHSEN, JULIE N.L. ALBERT, Tulane Univ — The phase behavior of binary and ternary blends composed of poly(styrene-*b*-dimethylsiloxane) (PS-*b*-PDMS) and corresponding homopolymers of polystyrene (PS) and polydimethylsiloxane (PDMS) in thin films was investigated using atomic force microscopy(AFM). Films were cast on preferential surfaces that led to parallel orientation upon thermal annealing. AFM height images revealed the formation of islands or holes at the surface of the films from which the domain spacing was determined. The addition of PS to PS-*b*-PDMS changes the composition, which results in domain swelling as well as a shift in nano/microstructure in binary blends. For ternary blends, incorporation of PS and PDMS in the BCP system is done such that the overall composition of the blends remains the same as the pristine PS-*b*-PDMS. Again, domain spacing increased with increasing homopolymer addition; because the lamellar nano/microstructure was retained, a shift from holes to islands was observed for constant film thickness. Additionally, as long as the thin film blends retain morphological integrity, the theoretical and experimental surface coverage of island/hole features showed good agreement for both binary and ternary blend systems.

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