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Temperature effects on the interfacial properties of semifluorinated diblock copolymer thin films.[1] UMESH SHRESTHA, Clemson University, STEPHEN CLARSON, University of Cincinnati, DVORA PERAHIA, Clemson university — The interfacial composition and structure of polymer films influence their response to external stimuli and their wetting behavior. Here we probe temperature effects on the interfacial morphology and surface energies of polytrifluoro propyl methyl siloxane-*b*-polystyrene (SiF-b-PS) films with SiF volume fraction of $\varphi = 0.03$ to 0.46 using atomic force microscopy and surface tension measurement. Films were cast from toluene, selective for PS, and annealed at temperatures ranging from 75 to 210C, below and above T_g of the PS block (˜98C). For $\varphi = 0.03$ a network of small aggregates is formed and hardly changed over the temperature range studied. For $\varphi = 0.16$ an asymmetric diblock, spherical aggregates at room temperature transformed to elongated ones at elevated temperatures whereas in the symmetric case, spherical assemblies at room temperature merged into larger structures. Independent of SiF fraction the contact angle increased with temperature which is indicative of migration of fluorine to the interface. Surprisingly, dewetting was not observed even annealing the film at much higher temperature than T_g of PS.

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