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Response of Semifluorinated-Si Containing Diblock Co-polymers to Solvent Stimuli UMESH SHRESTHA, DVORA PERAHIA, Clemson University, STEPHEN CLARSON, University of Cincinnati — The response of semifluorinated diblock co-polymers to solvents has been studied by neutron reflectometry. Polytrifluoro propyl methyl siloxane -*b*- polystyrene (FSi-PS) with different volume fraction of the fluorinated block ranging from 0.03 to 0.5 were exposed to water and toluene as stimuli. FSi-PS segregated into layers with the air interface being fluorine rich. Upon exposure to water as stimuli, at small volume fractions of the FSi, no response was observed. Increasing the size of the FSi segments resulted in small interfacial rearrangements however no swelling was observed. The small interfacial changes are sufficient to affect the surface energy and adhesion of the diblocks as desired of a responsive interface. Changing the nature of the stimuli to toluene, which is a good solvent for polystyrene, the diblock co-polymer swelled almost immediately independent on the volume fraction, though the inherent layered structure was retained. The degree of fluorine that resides at the interface in this case depends on the volume fraction and the exposure time. Over all, the study has shown that internal segregation of the blocks and their distinct different affinities to the solvents provide the driving forces for their response.

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