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Structural Rearrangement of Semifluorinated Diblock copolymer Thin Films Exposed to Selective Solvents UMESH SHRESTHA, DVORA PERAHIA, Clemson University, STEPHEN CLARSON, University of Cincinnati — A neutron reflectometry study reveals the response of a semifluorinated diblock copolymer poly trifluoro propyl methyl siloxane -*b*- polystyrene co-polymer thin films of ca. 50-70nm, to selective solvents. This diblock forms surface induced layered structure at volume fractions of the F segment ranging from 0.03 to 0.50. When exposed to toluene, a selective solvent for PS, the film swelled instantaneously, while retaining its layered structure. The solvent however penetrates into both the PS and the semifluorinated layers. In contact with decane vapor, the solvent penetrates predominantly the top fluorinated layers. The rate of penetration increases with increasing volume fraction of the fluorinated segment. In contrast with toluene, the solvent remains at the top layer only for extended periods again retaining the layered structure. The incompatibility and specific affinity of different blocks drive structural rearrangements at the interface as a response to external stimuli, retaining the layers structure.

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