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Swelling Behavior of Diblock Copolymer Brushes. BULENT AKGUN, Department of Materials Science and Engineering, University of Maryland, College Park, MD 20742, SUSHIL SATIJA, Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, Maryland 20899, GOKCE UGUR, MARK D. FOSTER, Department of Polymer Science, The University of Akron, Akron, OH 44325 — Diblock copolymer brushes (DCBs) have garnered enormous interest in recent years due to their stimuli-responsive behavior. The characteristics of a surface of a DCB can be changed reversibly from those of one type to those of another by using a selective solvent for one block. There has not been any experimental study to prove either the dry state structure or the surface rearranged structure or the mechanism of that rearrangement. To understand the switching mechanism we have investigated the swelling behavior of DCBs in selective and good solvents using in-situ using neutron reflectivity. When DCBs are treated with selective solvents, in-situ measurements show that the structure changes to minimize the unfavorable interaction between solvent and the block that does not like the solvent. When swollen with a liquid solvent good for both blocks, DCBs behave similarly to homopolymer brushes, establishing a parabolic profile of chain segment density.

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