

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Internal Structure of Diblock Copolymer Brushes. BULENT AKGUN, CHARLES F. MAJKRZAK, SUSHIL SATIJA, Center for Neutron Research, National Institutes of Standards and Technology, Gaithersburg, MD 20899, GOKCE UGUR, WILLIAM J. BRITTAIN, MARK D. FOSTER, Department of Polymer Science, The University of Akron, Akron, OH 44325-3909, XUEFA LI, JIN WANG, Experimental Facilities Division, Argonne National Laboratory, Argonne, IL 60439 — Although diblock copolymer brushes (DCBs) have been studied due to their stimuli-responsive behavior, their internal structure has been unknown. We have resolved the internal structure of DCBs using neutron reflectivity and grazing incidence small-angle X-ray scattering (GISAXS). The internal brush structure of DCBs of polystyrene-*b*-poly(methyl acrylate) (PS-*b*-PMA) and PMA-*b*-PS depends strongly on the block sequence and the value of χN . For the thinnest films a model of two layers with an interfacial region of finite width provides a good description of the data. For dPS-*b*-PMA films that are thicker and of sufficiently asymmetric composition, a third layer must be included. The necessity of including a third layer is consistent with lateral ordering of some type in the center of the brush, as evidenced by correlation peaks in GISAXS data.

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Date submitted: 21 Nov 2008

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