Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Interface Behavior in Diblock Copolymer Brushes GOKCE UGUR, BULENT AKGUN, WILLIAM J. BRITTAIN, MARK D. FOSTER, Maurice Morton Institute of Polymer Science,The University of Akron, Akron, OH 44325, XUEFA LI, DONG RYEOL LEE, JIN WANG, Experimental Facilities Division, Argonne National Laboratory, Argonne, IL 60439 — A polymer brush is an assembly of polymer chains with one end tethered to a surface or an interface with a tethering density high enough that the polymer chains are forced to stretch away from the substrate. This stretching of polymer chains along the direction normal to surface is different from the typical behavior of flexible chains. The study of surface and interface properties of polymer brushes is important for their use in nano-scale applications. We investigated the surface and interface structure of polystyrene-b-polymethylacrylate (PS-*b*-PMA) diblock copolymer brushes that have been synthesized using atom transfer radical polymerization (ATRP). Grazing incidence small angle X-ray scattering (GISAXS) was used to probe the structure of the surface as well as the buried interfaces of the brushes. It showed that there are lateral correlations inside the brush and that the spacing of these structures is on the order of the top layer thickness of the brush. Analysis of the GISAXS data provides information for values of the in-plane scattering vector that are larger than those accessible using a conventional transverse scan.

Mark D. Foster
The University of Akron

Date submitted: 30 Nov 2005 Electronic form version 1.4