

Abstract Submitted  
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**Towards a Universal Profile for Polymer Brushes: Effect of Surface Heterogeneity on Brush Structure** S. MICHAEL KILBEY, II, PENG TIAN, Department of Chemical Engineering, Clemson University, HIROSHI WATANABE, Institute for Chemical Research, Kyoto University — Amphiphilic block copolymers can be preferentially assembled at the solid-fluid interface to form polymer brushes. Brushes are of interest because they can mediate interactions across interfaces and confer desirable properties to the underlying surface. Using the surface forces apparatus, we have studied the forces of interaction between opposing brushes made from comb and mikto-arm copolymers (made of polystyrene/polyvinylpyridine and polystyrene/polyisoprene copolymers) as these layers are brought into and out of molecular level contact. The brushes formed from these branched polymer amphiphiles display an additional repulsion due to local effects (branching) and anchor block heterogeneity. We will describe how we have used these results on branched brushes and their linear analogs to develop a predictive universal profile based on a mean field description of the brush that properly scales the dependence of the force of interaction on molecular weight, tethering density, segment size, branching, solvent quality, and surface heterogeneity.

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