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Tethered Polymer Interactions with Attractive Surface Potentials RYAN VAN HORN, JOSEPH X. ZHENG, HUIMING XIONG, WILLIAM Y. CHEN, KYUNGMIN LEE, RODERIC P. QUIRK, University of Akron, BERNARD LOTZ, Institut of Charles Sadron, EDWIN L. THOMAS, MIT, AN-CHANG SHI, McMaster University, STEPHEN Z.D. CHENG, University of Akron — Due to their surface modification capabilities, tethered polymer chains have been a research focus for several years. Experimental and theoretical work has been done to understand the conformations and interactions of these systems at varying tethering densities. A new technique developed in our group makes it possible to use single crystals of crystalline-amorphous diblock copolymers to study tethered polymer chains. These systems have controlled density through defined fold numbers and controlled MW through living polymerization. Zheng and coworkers found that the reduced tethering density is 3.7 for the onset of interchain interaction and 14.3 for the highly-stretched brush. This work provides, for the first time, the values of these two onsets with high certainty; however, the systems studied do not provide general results. Both systems had repulsive interactions between the surface and the tethered chains. In order to broaden the scope of the physics behind tethered polymer chains, the study should include systems with attractive potentials. Preliminary studies of one such system, PMMA-b-PLLA, will be presented.

Ryan Van Horn
University of Akron

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