

Abstract Submitted  
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**pH-Responsive Behavior of Poly(acrylic acid) Brushes of Varying Thickness** VIVEK YADAV, MEGAN ROBERTSON, JACINTA CONRAD, Univ of Houston — We have investigated the pH-dependent response of polyelectrolyte brushes of varying thickness. Our model system consists of poly(acrylic acid) brushes, which change from hydrophobic and neutral at low pH to hydrophilic and negatively charged at high pH, synthesized using a grafting-from approach at constant grafting density. As the polymer brush thickness increased, the brushes exhibited greater hysteresis in static water contact angle as a function of pH. We extracted the pKa of the polymer brushes from contact angle measurements. The relationship between the pKa and brush thickness depended on the order in which the brushes were exposed to solutions of varying pH: pKa decreased on increasing brush thickness when going from basic to acidic medium whereas pKa increased on increasing brush thickness when going from acidic to basic medium. We speculate that the origin of hysteresis can be explained by pH-dependent conformational changes in these polyelectrolyte brushes.

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