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Effect of Interfacial Curvature on the Miscibility of Mixed Charged and Neutral Polymer Brushes YOU-YEON WON, KEVIN WITTE, Purdue University — We present a theoretical study of the phase behavior of a mixture of neutral and polyelectrolyte polymers attached to a surface or interface in a brush configuration. The Edward's formalism for the Green's function is extended to incorporate electrostatic effects and allow for mixtures of mutually incompatible brushes. The resultant self-consistent field (SCF) equations are numerically evaluated for spherical and cylindrical geometries within the mean field approximation. Phase behavior of the surface constrained polymer mixture (assuming mobile grafting points) is explored by calculating the system free energy and applying the standard free energy of mixing analysis. The effect on the brush mixture miscibility of varying the surface/interface curvature at constant grafting density is extensively investigated. It is further demonstrated that the correlation between brush miscibility and curvature vary with the charge of the polyelectrolyte brushes.

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