

Theory of melt polyelectrolyte blends and block copolymers: Phase behavior, surface tension and microphase periodicity

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Polymer mixtures such as blends or block copolymers are of great interest in energy applications and functional materials, and often, one or more of these species contain charges. Here, we adapt a new and rigorous approach that does not rely on the mean-field assumptions inherent in the PB theory and instead uses Liquid State (LS) integral equation theory to articulate charge correlations that are completely neglected in PB. Beyond providing phase behavior of blends and block copolyelectrolytes, we can use this theory to investigate the interfacial properties such as surface tension and block copolyelectrolyte lamellar spacing.

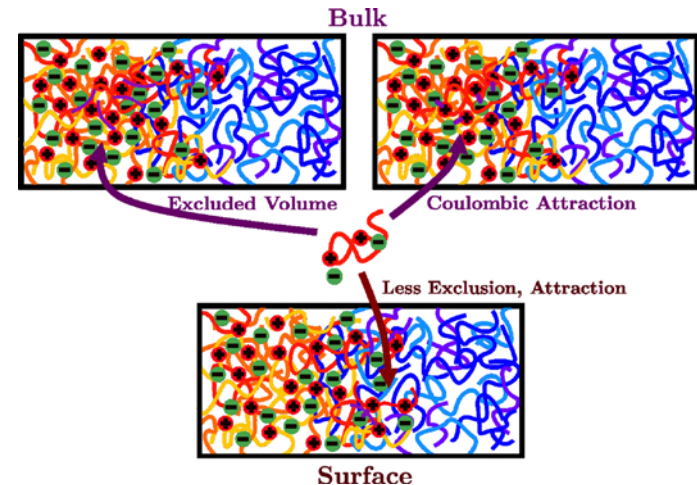


Figure. Placement of a single polyelectrolyte chain into either the bulk or the surface of a phase separated blend provides a conceptual picture of how the surface tension changes as a function of Γ and a .

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