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Combined theoretical formulation of Energetic and Entropic driving forces of polymers towards surfaces and comparison with experiments
VENKAT MINNIKANTI, School of Chemical and Biomolecular Engineering, Cornell University, LYNDEN ARCHER, School of Chemical and Biomolecular Engineering, Cornell University — An analytical comparison of the energetic attraction of a polymer towards a surface with entropic driving forces of a polymer has been elusive in the field of surface enrichment of polymers at surfaces. The prediction of crossover molecular weights for surface enrichment of polymers in blends, wherein the dominant of the above mentioned effects is reversed have been restricted to computer simulations in the past. Here we will provide a simple linear response theory that will compare these effects as competitive driving forces towards a surface. Predictions will be made using this theory for the cross over molecular weights and the analysis is extended for polymers of branched architectures. Comparisons of this theory with experiments involving star-linear blends of polybutadienes as well as with lattice simulations will be presented.

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