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Flory Theorem for Structurally Asymmetric Mixtures ANDREY DOBRYNIN, Institute of Materials Science, University of Connecticut, FRANK SUN, DAVID SHIRVANYANTS, GREGORY RUBINSTEIN, MICHAEL RUBINSTEIN, SERGEI SHEIKO, Department of Chemistry, University of North Carolina at Chapel Hill, HYUNG-IL LEE, KRZYSZTOF MATYJASZEWSKI, Department of Chemistry, Carnegie Mellon University — The generalization of the Flory theorem for structurally asymmetric mixtures was derived and tested by direct visualization of conformational transformations of brushlike macromolecules embedded in a melt of linear chains. Swelling of a brush molecule was shown to be controlled not only by the degree of polymerization of the surrounding linear chains, NB, but also by the degree of polymerization of the brush's side chains, N, which determines the structural asymmetry of the mixed species. The boundaries of the swelling region were established by scaling analysis as $N^2 < NB < NA/N$, where NA is the degree of polymerization of the brush backbone. Experiment and theory demonstrated good agreement.

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