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Predicting the Viscosity of a Miscible Polymer Blend JEFFREY HALEY, TIMOTHY LODGE, University of Minnesota — The composition-dependent rheological properties of polymer mixtures have been a topic of long-standing interest. We present a roadmap for viscosity predictions for the simplest binary polymer mixture, a miscible polymer blend. Drawing on the Lodge-McLeish model to predict the composition dependences of segmental dynamics, and the double reptation model to account for the chain dynamics, we present new comparisons of predictions with model blend viscosity data. The results suggest that some outstanding issues regarding the prediction of component chain dynamics remain. A modified constraint release model improves the prediction of component longest relaxation times and is able to resolve some of the observed discrepancies between experiment and theory.

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