Predicting the Viscosity of Polymer Mixtures

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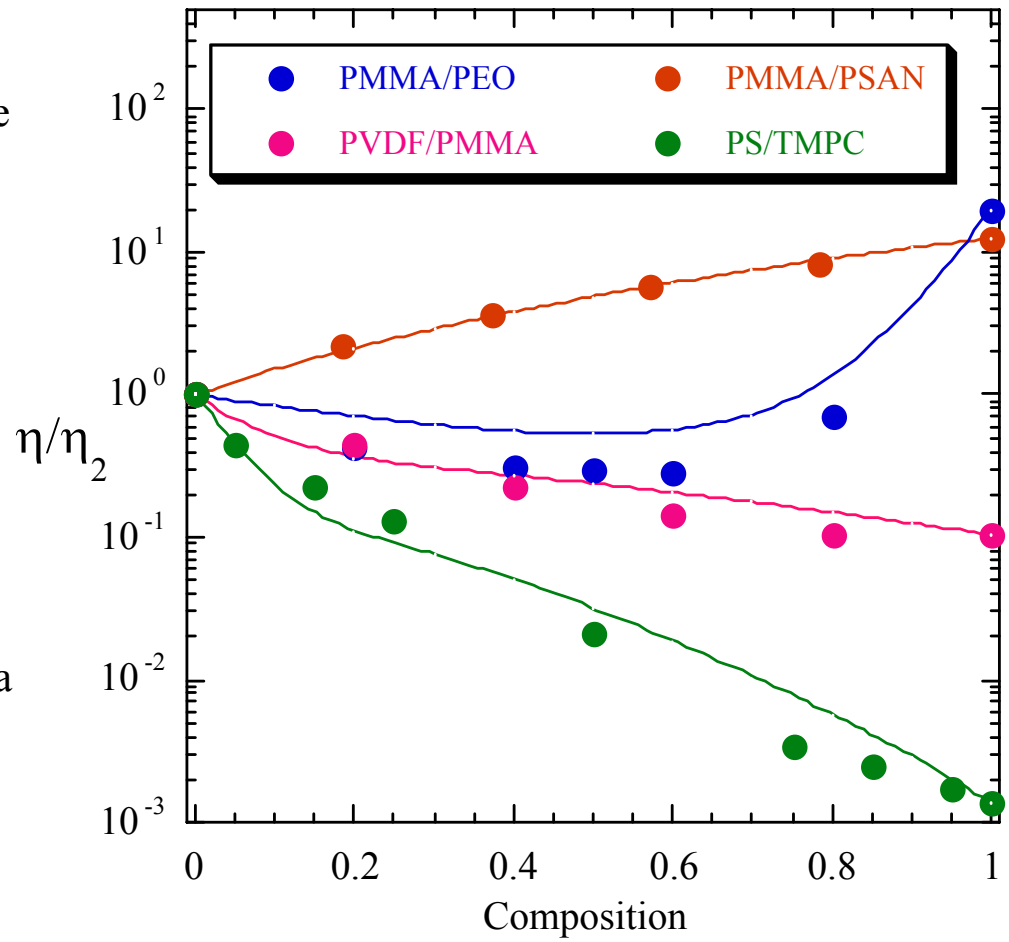
Polymer materials are ubiquitous in modern society, and the majority of these substances contain multiple chemical ingredients. Almost all polymers are processed as liquids, and the preeminent material parameter that affects processing is the viscosity. Surprisingly, perhaps, there has not yet been a successful, predictive model of the viscosity of polymer mixtures based on solely on well-defined molecular parameters. We have recently proposed such a model; the curves through the data in the figure represent parameter-free predictions for various published data.



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Education:

This work was conducted by Jeff Haley (a doctoral candidate in Chemical Engineering), Kevin Cavicchi (who just received his Ph.D. in Materials Science), Tom Chastek (a doctoral candidate in Chemistry) and Dr. Dan Savin (who just joined the Chemistry faculty at the University of Vermont). Summer undergraduates who also participated were Stephanie Oehlke (Michigan Tech), Nigel Milbridge (Augsburg College), and Anne Larson (South Dakota School of Mines). Jeff was awarded the "Best Student Poster Prize" at the 2002 Meeting of the Society of Rheology for his work on this project.

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