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Miscibility of Polymers in Supercritical Solvents\textsuperscript{1} JEFFREY DE-FELICE, JANE LIPSON, Dartmouth College — In this work we make use of our ability to correlate underlying thermodynamic behavior with trends in miscibility to study mixtures of polymers and supercritical carbon dioxide (scCO\textsubscript{2}). scCO\textsubscript{2} has garnered significant interest as a “green” solvent, and supercritical solvent in general, for its highly accessible critical point. Experimental cloud point investigations have determined the miscibility for a range of polymers in scCO\textsubscript{2}. We have used a simple equation of state (EOS) to study a series of poly-(acrylates) in scCO\textsubscript{2} solvent. Although polymer/scCO\textsubscript{2} mixtures have been modeled with some success in the past, the ability of an EOS to make accurate predictions has yet to be demonstrated. Our mixture modeling procedure yields parameters from pure component experimental data. Then, by pinning the mixed interaction parameter to the experimental critical temperature (T\textsubscript{c}) for one mixture from the series, we predict the T\textsubscript{c} shifts for the remaining members. In addition to discussing miscibility we draw insight via the trends revealed from the parameterization of the pure component data, alone.

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