

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Miscibility of Polymers in Supercritical Solvents¹ JEFFREY DEFELICE, 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 (scCO₂). scCO₂ 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 scCO₂. We have used a simple equation of state (EOS) to study a series of poly-(acrylates) in scCO₂ solvent. Although polymer/scCO₂ 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_c) for one mixture from the series, we predict the T_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.

¹Funded by GAANN Fellowship

Jeffrey DeFelice
Dartmouth College

Date submitted: 05 Dec 2012

Electronic form version 1.4