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Effect of Supercritical Carbon Dioxide on Polymer Blend Miscibility NICHOLAS YOUNG, SEBNEM INCEOGLU, University of California, Berkeley, ANDREW JACKSON, None, STEPHANE COSTEAUX, Dow Chemical Company, NITASH BALSARA, University of California, Berkeley — Supercritical fluids have been investigated as environmentally benign solvents for the processing of polymers on the industrial scale. In this work, we study the effect of supercritical carbon dioxide ($scCO_2$) on the phase behavior of a blend of a random copolymer and a homopolymer. Styrene-acrylonitrile copolymer (SAN) and poly(methyl methacrylate) (PMMA) are known to display lower critical solution temperature-type phase behavior, undergoing a transition from a homogeneous mixture to a phase-separated blend upon heating. Depending on certain parameters such as SAN composition (w_{AN}) and blend fraction (ϕ_{SAN}), the miscibility window for the two polymers can be tuned over a significant temperature range by introducing $scCO_2$ into the system. Using small angle neutron scattering, the thermodynamic interactions between SAN and PMMA as described by the Flory-Huggins parameter χ are shown to be strongly dependent on $scCO_2$ activity.

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