

High Pressure Phase Behavior for the Poly[tridecyl methacrylate] and Tridecyl Methacrylate in Supercritical Carbon Dioxide and Dimethyl Ether

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Experimental cloud-point curves for poly(tridecyl methacrylate) [P(TDMA)] + tridecyl methacrylate (TDMA) or dimethyl ether (DME) in supercritical CO₂ show the binary and ternary mixtures up to 200 °C and 2,600 bar. The location of the P(TDMA) + CO₂ cloud-point curve shifts to lower temperatures and pressures when TDMA or DME is used as a cosolvent. P(TDMA) does not dissolve in pure CO₂ to the temperature of 220 °C and the pressure of 2,800 bar. High pressures phase behavior data is presented for the CO₂ + TDMA system at 40 ~ 120 °C and up to ca. 255 bar. The system exhibit type-I phase behavior with a continuous mixture-critical curve and the system is adequately modeled with the Peng-Robinson equation of state.