Phase behavior for the Poly[2-(2-ethoxyethoxy) ethyl acrylate] and cosolvents in supercritical fluid solvents

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The experimental data obtained in this work for the binary and ternary mixture of the poly[2-(2-ethoxyethoxy)ethyl acrylate] [P(2-(2-EEEA))] + supercritical fluid solvents + coslovents systems are measured at a temperature range from 60.0 ℃ to 213.0 ℃ and at a pressure up to 2130 bar. Cloud-point behaviors of those systems were showed in changed of the pressure-temperature (P-T) as solvent content was changed. In case of the P(2-(2-EEEA)) + CO2 + 65.0 wt.% 2-(2-ethoxyethoxy) ethyl acrylate (2-(2-EEEA)) system, phase behavior of liquid + liquid + vapor region was observed. Pressure-composition (P - x) isotherms are obtained for the CO2 + 2-(2-EEEA) system using static apparatus at five temperatures (40, 60, 80, 100 and 120) ℃ and pressure up to 228.6 bar. The carbon dioxide + 2-(2-EEEA) system exhibits type-I phase behavior with continuous mixture critical curve. The experimental result for this system is correlated with Peng-Robinson equation of state using mixing rule including two adjustable parameters. The critical properties of 2-(2-EEEA) is calculated with Joback and Lee-Kesler method.