

Phase Behavior for Binary Mixture of Triethylene Glycol Diacrylate and Triethylene Glycol Dimethacrylate in Supercritical Carbon Dioxide

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Pressure-composition ($P - x$) isotherms for phase behavior data for the carbon dioxide (CO_2) + triethylene glycol diacrylate (TEGDA) and CO_2 + triethylene glycol dimethacrylate (TEGDMA) systems are measured by using static apparatus at five temperatures of (40, 60, 80, 100 and 120) °C and pressure up to 333.4 bar. Both systems have continuous critical mixture (locus) curves that exhibit maximums in pressure - temperature space between the critical temperatures of CO_2 and TEGD(M)A. The solubility of TEGDA and TEGDMA for those systems increases as the temperature increases at a fixed pressure. The experimental results for the CO_2 + TEGDA and CO_2 + TEGDMA systems are modeled with Peng-Robinson equation of state using a mixing rule including two adjustable parameters. The critical constants for TEGDA and TEGDMA are predicted with Joback method, and the acentric factor was estimated using Lee-Kesler method.