

Phase Behavior of Binary and Ternary Mixtures for P(MMA-co-OFPMA) by Supercritical Dispersion Polymerization

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In this study, poly(methyl methacrylate-co-2,2,3,3,4,4,5,5-octafluoropentyl methacrylate) [P(MMA-co-OFPMA)] as a fluorine copolymer was prepared using supercritical dispersion polymerization in scCO₂. In addition, Pressure isotherms for phase behavior of binary and ternary systems between P(MMA-co-OFPMA) and association liquid fluid as well as the influence of quality of association solvents (CH₂F₂, CHF₃, F-22), and monomer (MMA) were measured. To obtain cloud-point data of binary and ternary mixture for the P(MMA-co-OFPMA) + solvents, the P(MMA-co-OFPMA) + CH₂F₂, CHF₃, or F-22 + MMA systems, these experiment are conducted. High pressure phase behavior experiment for the binary and ternary mixture of the P(MMA-co-OFPMA) + CH₂F₂, CHF₃, or F-22 systems are measured within a temperature range of (333.6 ~ 456. 0) K and pressure up to about 153.62MPa. The P(MMA-co-OFPMA) + CH₂F₂, CHF₃, or F-22 + MMA (or F-22) systems show the changes in the pressure-temperature curve from upper critical solution temperature (UCST) region to lower critical solution temperature (LCST) region as MMA (or F-22) concentration increases.