Impact of Cosolvent on the Phase Behavior of Binary and Ternary Mixtures for Poly (benzyl acrylate) and Poly(benzyl methacrylate) in Supercritical CO_2 and DME

장윤석, Shuang Liu, 변헌수*
전남대학교 공학대학 생명화학공학부
(hsbyun@chonnam.ac.kr*)

Experimental cloud-point data up to 160 oC and 1930 bar are reported for binary and ternary mixtures of poly(benzyl methacrylate) [P(Bn MA)] + carbon dioxide + benzyl methacrylate [Bn MA] and poly(benzyl acrylate) [P(Bn A)] + carbon dioxide + benzyl acrylate [Bn A] systems. High pressure cloud-point data are also reported for [P(Bn MA)] + carbon dioxide and [P(Bn A)] + carbon dioxide in supercritical dimethyl ether. Cloud-point behavior for the [P(Bn MA)] + carbon dioxide + Bn MA system were measured in changes of the pressure-temperature (p - T) slope, and with Bn MA mass fraction of 50.6, 61.0, 67.2 and 95 wt%. The [P(Bn A)] + carbon dioxide + 30.4, 40.7 and 49.4 wt% Bn A systems change the (p - T) curve from upper critical solution temperature region to lower critical solution temperature region as the Bn A mass fraction increases. With 52.3 wt% Bn A to the P(Bn A) + carbon dioxide solution, the cloud-point curves takes on the appearance of a typical lower critical solution temperature boundary. Also, the impact by cosolvents mass fraction for the [P(Bn MA)] and [P(Bn A)] + dimethyl ether system is measured at temperature to 180 oC and pressure range of 246 to 613 bar.