

Cloud-point behavior on the cosolvent effect of binary and ternary system for the poly(vinyl stearate) in supercritical carbon dioxide

정종환, 조상하<sup>1</sup>, 변헌수<sup>1,†</sup>

전남대학교; <sup>1</sup>전남대학교 화공생명공학과

(hsbyun@jnu.ac.kr<sup>†</sup>)

In this work, high pressure cloud-point behavior were reported for poly(vinyl stearate) [P(VS)] in carbon dioxide, propane, propylene, butane, 1-butene, and dimethyl ether (DME), as well as for the P(VS) + vinyl stearate (VS) ( or DME, acetone, ethanol) in supercritical CO<sub>2</sub>. Phase behavior for P(VS) in C<sub>3</sub> hydrocarbons were about 20 MPa higher than P(VS) + C<sub>4</sub> hydrocarbons curves, at a fixed temperature of about 393 K. The cloud-point curve for the P(VS) + DME mixture was located between C<sub>3</sub> and C<sub>4</sub> hydrocarbons at pressures below about 20.0 MPa. The P(VS) + CO<sub>2</sub> + 63.0 wt% VS phase behavior curves intersect a fluid → liquid + vapor (LV) curve at temperatures of 353.6 K (at 24.5 MPa). The location of the P(VS) + CO<sub>2</sub> cloud-point curve shifts to lower temperatures and pressures upon the addition of acetone or ethanol. High pressures phase equilibrium data were presented for the CO<sub>2</sub> + VS system at temperatures ranging from (313.2 to 393.2) K and pressures up to 27.4 MPa. The CO<sub>2</sub> + VS system exhibits type-I phase behavior with a continuous critical mixture curve and was modeled using the Peng-Robinson equation of state.