

High Pressure Phase Behavior of Binary Mixture for the Octafluoropentyl Acrylate and Octafluoropentyl methacrylate in Supercritical Carbon Dioxide

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Pressure-composition isotherms are obtained for the carbon dioxide + 2,2,3,3,4,4,4-octafluoropentyl acrylate (OFPA) and carbon dioxide + 2,2,3,3,4,4,4-octafluoropentyl methacrylate (OFPMA) system using a static apparatus at temperature range from 313.2K to 393.2K and pressures up to ca. 17.9 MPa. The solubility of OFPA and OFPMA for the (carbon dioxide + OFPA) and (carbon dioxide + OFPMA) systems increases as the temperature increases at constant pressure. Liquid-liquid-vapor equilibria for the (carbon dioxide + OFPA) and (carbon dioxide + OFPMA) systems were not observed at these conditions. We determined new parameters by Joback, modified Joback and Constantinou-Gani group contribution method for the critical constants. The acentric factor was determined using by Ambrose and Walton. Using these parameters, the experimental results for (carbon dioxide + OFPA) and (carbon dioxide + OFPMA) systems are correlated with Peng-Robinson equation of state using a van der Waals one-fluid mixing rule including two adjustable parameters.