

## High Pressure Vapor-Liquid Equilibrium of the Binary Systems of Carbon Dioxide + Acetates

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Acetates are used in various fields of chemical and biological engineering. Specially, isoamyl acetate is one of the natural flavors widely used in the food, cosmetic, and pharmaceutical industries. Recently, the production of acetates using enzymes in supercritical fluids emerged as an alternative for conventional synthesis processes. In enzyme kinetics studies, the thermodynamic behaviors of the vapor-liquid equilibrium (VLE) and the reaction equilibrium play an important role.

High pressure VLE data were measured for binary carbon dioxide and acetate (isopropyl acetate, isobutyl acetate, and isoamyl acetate) systems at 313.15 and 333.15 K and up to 17 MPa. To measure the solubility of acetates in carbon dioxide, a circulating type apparatus with on-line gas chromatography was used in this study. Measured experimental data were correlated by the Peng-Robinson and nonrandom lattice fluid with hydrogen bonding (NLF-HB) equations of state with a binary interaction parameter ( $k_{ij}$ ). The relative accuracy of the data was discussed for the measured and calculated data of the carbon dioxide and acetate systems.