

Liquid-liquid equilibrium of ternary mixtures of water + 1-butanol + C1 ~ C5 acetate at 298.15K

오하영, 박소진<sup>†</sup>

충남대학교

(sjpark@cnu.ac.kr<sup>†</sup>)

Expected biobutanol can reduce emissions of harmful gases into the atmosphere. Butanol is a high calorific value, relatively low heat of vaporization, and is less corrosive than ethanol. Currently, butanol is considered as an alternative biofuel. Further process improvements are required to compete with conventional crude-oil-based processes. The research of phase transitions by chemical reaction is recently interest for the industrial separation processes. The separation of equilibrium mixture and recycling of the reactants is important processes based on greener technologies. However, solvent mixtures contain azeotropes so their separation by simple distillation difficulties. The potential processes for separating azeotropes has Liquid-liquid equilibrium (LLE).

In this work, experimental study and modeling of the LLE in the ternary systems {water + 1-butanol + methyl acetate}, {water + 1-butanol + ethyl acetate}, {water + 1-butanol + propyl acetate}, {water + 1-butanol + butyl acetate} and {water + 1-butanol + amyl acetate} at 298.15K and atmospheric pressure. The consistency of experimental tie-line data was confirmed by the Gibbs energy (GE) models NRTL and UNIQUAC.