

Solid-Liquid Equilibria, excess molar volume and deviations in molar refractivity for binary systems of acetic acid with propionic acid, butyric acid and valeric acid

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Faced with problems of finite oil resources and the climate change, many countries have to be absorbed in the development of energy from renewable resources. Biobutanol has emerged as next-generation alternative energy since 2000. As the similarity between biobutanol and gasoline, it has advantages over bioethanol in blending with gasoline, distribution, transportation and use and can be directly used in present automobile engines. The aim of this study is to determine the equilibrium data of binary mixtures for byproduct of biobutanol fermentation. The solid-liquid equilibrium data for the binary systems {acetic acid + propionic acid}, {acetic acid + butyric acid} and {acetic acid + valeric acid} were measured at atmospheric pressure by the visual method. The experimental SLE data were correlated with the NRTL and UNIQUAC activity coefficient model. In addition, excess molar volume( $V^E$ ) and deviations in molar refractivity ( $\Delta R$ ) for the same binary mixtures at 298.15 K and correlated with the Redlich-Kister equation.