

Liquid-liquid equilibria for binary system of Di-butyl ether (DBE) + water and the ternary systems of DBE + C1~C4 alcohols + water at 298.15 K

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In general oxygenated ether compounds are neutral and have very low or no solubility in water, however they are easily dissolved in most organic compounds. Over the last years, ethers have been pointed as healthier and friendlier anti-knock additives for gasolines, replacing typical leaded compounds which had been traditionally used. We have studied on the phase equilibria and mixture properties systematically for several ether compounds, because the accurate data of such properties are strongly related to the processing of their compounds and application of group contribution method.¹⁻⁸ To our knowledge, there are no binary LLE data for the system Di-butyl ether (DBE) + water and few LLE investigations have been published for DBE contained ternary systems. In this study, The tie-line end compositions of four ternary systems of DBE + C1~C4 alcohols + water were experimentally determined at 298.15 K by using a static apparatus. These C1~C4 alcohols are methanol, ethanol, 1-propanol, 2-propanol, 1-butanol and 2-butanol. Measured tie lines data have been correlated using the NRTL and UNIQUAC equations, and showed good agreement.