

Thermodynamic Properties of Oxygenated Additives in Bio-Fuels: Excess Enthalpies of Ternary Mixtures Containing Dibutyl Ether (DBE), 1-Butanol and 1-Hexene at 298.15 K and 313.15 K

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The use of oxygenated compounds as gasoline-blending agents has been proposed to reduce emissions of new reformulated gasoline. Ether + alcohol + alkene mixtures are of interest as model mixtures for gasoline in which the alcohol and the ether act as non-polluting, high octane number blending agents. Measurements of alcohol + ether + 1-hexene are very scarce in the literature. From this point of view the study of the ternary mixture dibutyl ether + 1-butanol + 1-hexene is very interesting. Dibutyl ether (DBE) is used as blending agent in reformulated gasoline and it can be obtained as an added valued additive to second generation bio-fuels [1]. 1-butanol is a basic component in the synthesis of the DBE ether, and therefore is always contained as an impurity. Experimental excess enthalpies of the ternary system dibutyl ether DBE + 1-butanol + 1-hexene at 298.15 K and 313.15 K are reported. Excess enthalpies have been measured with a quasi-isothermal flow calorimeter [2], [3]. The experimental data have been fitted using the Redlich-Kister polynomial equation for ternary systems. The values of the standard deviation indicate the agreement between the experimental results and the fitted ones.

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