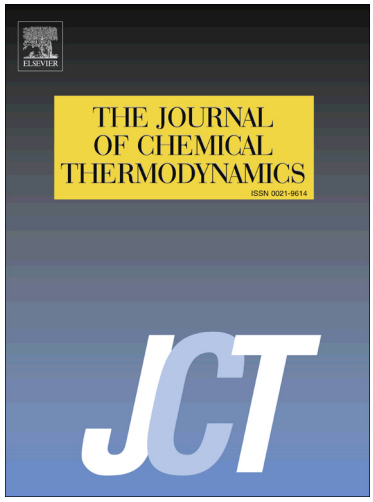

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Measurement and correlation of (vapour–liquid) equilibrium for binary mixtures composed of 1-(ethoxymethoxy)-propane with ethanol and 1-propanol at 101.33 kPa

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Abstract

Experimental vapour–liquid equilibrium (VLE) for binary mixtures composed of 1-(ethoxymethoxy)-propane with ethanol and 1-propanol at 101.33 kPa was measured. The experimental data of saturated vapour pressure for 1-(ethoxymethoxy)-propane was measured. The measurements were performed using an improved Rose equilibrium still. Two binary systems present a minimum boiling azeotropes at 101.33 kPa, in which the azeotropic temperature and composition are 351.45 K and 95.98 mole%(ethanol) and 369.44 K and 81.30 mole%(1-propanol), respectively. The VLE experimental values were correlated with the help of the NRTL, Wilson, and van Laar models for which the binary interaction parameters are reported. The results showed that the measurements have a good correlation under the NRTL and Wilson models about two binary systems, respectively. The thermodynamic consistency of the VLE experimental data was checked using the traditional area test and the direct test methods.

Keywords

Vapour–liquid equilibrium; Azeotrope; Ethanol; 1-Propanol; 1-(Ethoxymethoxy)-propane;

1. Introduction

1-(Ethoxymethoxy)-propane is a kind of oxygenated compound which can be synthesized from 1-propanol, ethanol and formaldehyde. The compound, serves as an additive, can increase the