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# Measurement and correlation of isobaric vapour-liquid equilibria for binary systems of 1-(methoxymethoxy)-2-methyl-propane with 1-butanol and isobutanol at 101.33 kPa

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## Abstract

Isobaric vapour-liquid equilibria (VLE) experimental results for binary systems of 1-(methoxymethoxy)-2-methyl-propane with 1-butanol and isobutanol at 101.33 kPa were determined. Each binary mixture shows a minimum boiling azeotrope at 101.33 kPa, in which the azeotropic temperature and composition are 381.19 K and 26.72 mole%(1-butanol) and 377.55 K and 53.34 mole%(isobutanol), respectively. The VLE measurements were correlated by the van Laar, Wilson and NRTL models for which the binary interaction parameters are reported. The results show that the measurements of two binary systems provide a good agreement with the calculated values acquired by the Wilson and NRTL models, respectively. The thermodynamic consistency of the VLE measurements was checked using the traditional area test and the direct test methods.

## Keywords

1-Butanol; Isobutanol; 1-(Methoxymethoxy)-2-methyl-propane; Vapour-liquid equilibria; Azeotrope;

## 1. Introduction

1-(Methoxymethoxy)-2-methyl-propane is a type of oxygenated compound which can be synthesized from formaldehyde, isobutanol and methanol. The compound serves as a diesel oil additive, can reduce soot formation and increase the combustion efficiency during combustion [1-3]. However, before developing the separation technology of 1-(methoxymethoxy)-2-methyl-propane,

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