

Excess Molar Enthalpies and Excess molar Volumes of Binary Mixtures of 1,2-dichloropropane with 2-pentanone and 3-pentanone at T=298.15 K and P=101.3 kPa

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The excess molar enthalpies H^E and excess molar volumes V^E at T=298.15 K and atmospheric pressure for the binary systems of 1,2-dichloropropane (1,2-DCP) with 2-pentanone and 3-pentanone have been determined from density and heat flux measurements using a digital vibrating-tube densimeter and an isothermal micro-calorimeter with flow-mixing cell, respectively.

Both H^E and V^E values of the binary mixtures are negative over the whole composition range, which could be explained by considering structural isomeric effect between 2- and 3-pentanone. The minimum values of H^E and V^E are varying from $-394.4 \text{ J}\cdot\text{mol}^{-1}$ (2-pentanone) to $-422.5 \text{ J}\cdot\text{mol}^{-1}$ (3-pentanone) and $-0.0975 \text{ cm}^3\cdot\text{mol}^{-1}$ (2-pentanone) to $-0.1191 \text{ cm}^3\cdot\text{mol}^{-1}$ (3-pentanone) around $x_1(1,2\text{-DCP}) \equiv 0.500$, respectively.

The experimental values of both H^E and V^E were fitted to Redlich-Kister equation to correlate the composition dependence of excess properties. In this work, the experimental excess enthalpy data have been also correlated using thermodynamic models (Wilson, NRTL, and UNIQUAC). The experimental results of excess properties have been qualitatively discussed.