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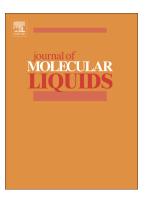
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Thermodynamic and interaction studies of binary liquid mixtures on the

basis of Flory's statistical theory and empirical relations

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Abstract

A number of important and useful thermodynamic properties of seven binary liquid mixtures namely

DPGDME + methanol, 1-propanol, 1-pentanol, 1-heptanol at 298.15K and oxolane + aniline, N-methyl

aniline, N-ethyl aniline at 303.15K, 313.15K & 323.15K have been computed on the basis of the most

widely accepted Flory's statistical Theory (FST). The component DPGDME is basically dipropylene glycol

dimethyl ether and oxolane known as tetrahydofuran are the key ethereal liquids with which the interactions

of popular solvents are analyzed. Also, some thermodynamics properties of aforesaid mixtures were

calculated from the recently proposed empirical correlations using density and ultrasonic velocity. The

theoretical results are compared with the experimental findings yielding quite satisfactory agreement. The

results are discussed in the light of interactions operating in the systems.

Keywords: Thermodynamic properties, Binary mixtures, FST, empirical correlations, interactions.

1. Introduction

The key factor in determining the thermodynamic properties of any pure substance is the

intermolecular forces viz. electrostatic forces, induction forces, chemical forces and dispersion

forces prevalent between the molecules of a substance depending on the type of molecules in the

vicinity of each other. The study of thermodynamic properties of mixture of pure components is

intricate and cumbersome due to interaction between similar and dissimilar components which

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