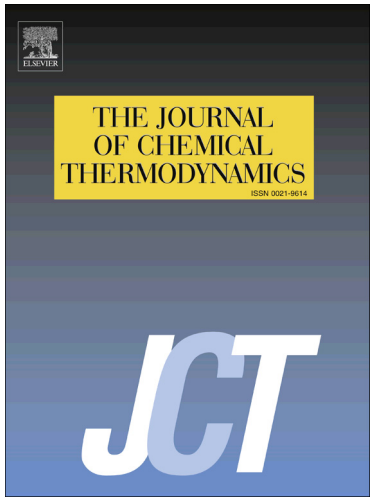

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Thermo-physical properties of L-alanine/L-valine in aqueous solutions of non steroid anti inflammatory drug dolonex at different temperatures: volumetric and acoustic approach

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Abstract

Thermodynamic properties of L-alanine and L-valine in aqueous solutions of drug dolonex, have been investigated by combination of volumetric and acoustic methods at various temperatures (293.15, 298.15, 303.15, 308.15 and 313.15) K and at atmospheric pressure. The experimental data is further used to calculate limiting apparent molar volume, V^o_{Φ}, limiting apparent molar volume of transfer, $V^o_{\Phi,tr}$, limiting molar isentropic compression, $K^o_{\Phi,S}$ and limiting apparent molar isentropic compression of transfer, $K^o_{\Phi,S,tr.}$ Furthermore, apparent molar expansivity, E^o_{Φ}, Hepler constant values, $\left(\frac{\partial E^o_{\Phi}}{\partial T}\right)_P$, coefficient of thermal expansion, α and hydration number, n_H were also calculated. The obtained results were used to interpret solute-solute and solute-solvent interactions in these systems. The volumetric and compressibility data suggests dominance of hydrophilic-hydrophilic interactions in these systems.

Keywords

Amino acids, *apparent molar properties*, *transfer properties*, *hydration number.*

1. Introduction

The direct study of interactions between large bio-molecules like enzymes, sugars, proteins and drugs are difficult to understand due to their complex three-dimensional structure [1]. Different substances result change in conformation of proteins when present in aqueous protein solutions. Certain molecules when added to protein solutions were exert stabilizing or destabilizing effect or neutral effect on native conformation of proteins [2]. Thermodynamic properties are very useful to understand the solute-solvent interactions present in mixed aqueous solutions [3,4].

Non-steroidal anti-inflammatory drugs (NSAIDs) show various properties like anti-pyretic, anti-inflammatory, analgesic, anti-thrombotic, etc [5]. Drug dolonex belongs to oxicam class