

Accepted Manuscript

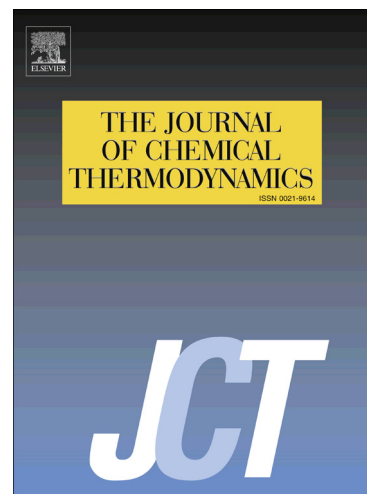
Acoustic and thermodynamic study of D-Panthenol in aqueous solutions of glycol at different temperatures

Nabaparna Chakraborty, Harsh Kumar, Kirandeep Kaur, K.C. Juglan

PII: S0021-9614(18)30432-4
DOI: <https://doi.org/10.1016/j.jct.2018.07.006>
Reference: YJCHT 5463

To appear in: *J. Chem. Thermodynamics*

Received Date: 1 May 2018
Revised Date: 6 July 2018
Accepted Date: 7 July 2018



Please cite this article as: N. Chakraborty, H. Kumar, K. Kaur, K.C. Juglan, Acoustic and thermodynamic study of D-Panthenol in aqueous solutions of glycol at different temperatures, *J. Chem. Thermodynamics* (2018), doi: <https://doi.org/10.1016/j.jct.2018.07.006>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Acoustic and thermodynamic study of D-Panthenol in aqueous solutions of glycol at different temperatures

Nabaparna Chakraborty¹, Harsh Kumar^{2*}, Kirandeep Kaur¹, K.C. Juglan^{1*}

¹Department of Physics, Lovely Professional University, Phagwara, 144401, Punjab, India.

²Department of Chemistry, Dr B R Ambedkar NIT, Jalandhar 144 011, Punjab, India

*Corresponding authors e-mail: kc.juglan@lpu.co.in, h.786.man@gmail.com

Abstract

The interaction of EG, DEG and TEG with biologically active D-Panthenol, as the function of temperature has been investigated by the combination of acoustic and volumetric methods. Speeds of sound and densities of EG, DEG and TEG in (0.05, 0.10 and 0.15) mol·kg⁻¹ in aqueous solutions of D-Panthenol have been measured at $T = (293.15, 298.15, 303.15 \text{ and } 308.15) \text{ K}$. From the density data, the apparent molar volume V_{ϕ}^0 and standard partial molar volume of transfer ΔV_{ϕ}^0 for EG, DEG and TEG in aqueous D-Panthenol solutions have been determined. From the speed of sound data, the partial molar isentropic compression $K_{\phi,s}$ and the partial molar isentropic compression of transfer $\Delta K_{\phi,s}^0$, have been determined. The pair and triplet interaction coefficient have also been estimated.

Keywords: Density, Ultrasonic Velocity, Apparent Molar Property, D-Panthenol, Glycol.

1. Introduction

The acoustic and thermodynamic characteristics of mixtures of liquid are used to study different the molecular interactions within the number of components in the liquid mixtures. The coalition between thermodynamic properties and the nature of the molecular interactions among the liquids is estimated, as it is an enticing prospect [1]. The speed of the sound is very much sensitive to the structure and the interactions taking place inside the system [2]. Polymers in the liquid form play an essential role in everyday life due to their extraordinary range of properties. Thus, ultrasonic technique has been sufficiently worked to investigate and understand the properties and the nature of molecular interaction taking place [3]. Glycol is an organic compound which belong to an alcohol family having two hydroxyl groups attached to different carbons and is often applied to ethylene glycol which has a sweet taste, no colour, oily liquid and a mild odour. It has its application in automobile cooling systems as antifreeze and in the manufacture of explosives, human-made fibres, low-freezing and brake fluid. It is extensively employed in plastic industries and chemical processes [4]. With the aid of acoustic and thermodynamic studies the insights about the molecular interactions could be made for different concentrations of D-Panthenol in different systems [5]. Panthenol is an alcohol, which is a pro-vitamin of B₅ and is odourless, highly viscous, slightly

Download English Version:

<https://daneshyari.com/en/article/6659621>

Download Persian Version:

<https://daneshyari.com/article/6659621>

[Daneshyari.com](https://daneshyari.com)