

Accepted Manuscript

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Kirandeep Kaur, Isha Behal, Kailash Chandra Juglan, Harsh Kumar

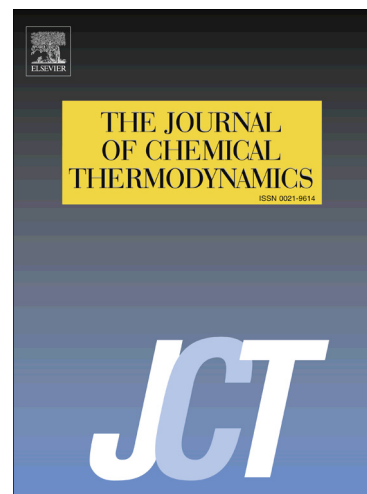
PII: S0021-9614(18)30230-1
DOI: <https://doi.org/10.1016/j.jct.2018.05.016>
Reference: YJCHT 5415

To appear in: *J. Chem. Thermodynamics*

Received Date: 23 March 2018
Revised Date: 18 April 2018
Accepted Date: 15 May 2018

Please cite this article as: K. Kaur, I. Behal, K.C. Juglan, H. Kumar, Volumetric and ultrasonic studies on interactions of ethylene glycol, diethylene glycol and triethylene glycol in aqueous solutions of glycerol at temperatures $T = (293.15\text{K} - 308.15)\text{K}$, *J. Chem. Thermodynamics* (2018), doi: <https://doi.org/10.1016/j.jct.2018.05.016>

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Volumetric and ultrasonic studies on interactions of ethylene glycol, diethylene glycol and triethylene glycol in aqueous solutions of glycerol at temperatures $T = (293.15\text{K} - 308.15) \text{ K}$

Kirandeep Kaur^a, Isha Behal^b, Kailash Chandra Juglan^{a*}, Harsh Kumar^{b*}

^aDepartment of Physics, Lovely Professional University, Phagwara – 144402, Punjab, India

^bDepartment of Chemistry, Dr B R Ambedkar National Institute of Technology, Jalandhar – 144011, Punjab, India

ABSTRACT

Densities and ultrasonic speed of ethylene glycol, diethylene glycol and triethylene glycol in (0.00, 0.01, 0.03, 0.05) mol·kg⁻¹ aqueous solutions of glycerol have been measured at $T = (293.15, 298.15, 303.15, 308.15) \text{ K}$ and experimental pressure $p = 0.1 \text{ MPa}$. From the density data, the apparent molar volume V_ϕ , the partial molar volume V_ϕ^0 and the partial molar volumes of transfer ΔV_ϕ^0 have been calculated for glycols from water to aqueous glycerol solutions. Using ultrasonic speed values apparent molar isentropic compression $K_{\phi,s}$, partial molar isentropic compression $K_{\phi,s}^0$ and partial molar isentropic compression of transfer $\Delta K_{\phi,s}^0$, have been evaluated. The pair and triplet coefficients have been computed from partial molar volumes of transfer and partial molar isentropic compression of transfer. The apparent molar isobaric expansion at infinite dilution $(\partial V_\phi^0 / \partial T)_p$, second order derivative $(\partial^2 V_\phi^0 / \partial T^2)_p$ have also been calculated. The parameters thus obtained have been discussed in terms of (solute-solute)/(solute-solvent) interactions prevailing in the present ternary system along with structure making/structure breaking tendency of glycols in aqueous glycerol solutions.

Keywords: Glycol, glycerol; apparent molar volume; apparent molar isentropic compression, ion-ion interaction

* Corresponding author e-mail: h.786.man@gmail.com; manchandah@nitj.ac.in (Harsh Kumar) kc.juglan@lpu.co.in (Kailash Chandra Juglan)

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