

Studies of relative and specific viscosities of Aceclofenacin 70% Dioxane water mixture at different temperature

S.A.Quazi*, D.T.Mahajan, Noor Mohammad, M.L.Narwade, Vijay Masand, M.R. Ingle

Department of Chemistry VidyaBhartiMahavidyalaya, Camp, Amravati (M.S) India.

Department of Chemistry Govt. Vidarbha Institute of Sci. and Humanities, Amravati (M.S) India. Department of Chemistry, G.S college, Khamgaon.

***Corresponding author: quazi.azhar@rediffmail.com**

ABSTARCT

Acelofenac drug plays their own identity in the drug, pharmaceutical and medicinal sciences in last decades. Hence, the viscometric study were carried out at 70% various percentage of solvent. The result obtained during this investigation directly focus on the dipole association of compound, intermolecular attraction between solute and solvent, dielectric constant of medium, and polarazibility.

Keywords: Acelofenac drug, dioxane water and viscometric measurements.

INTRODUCTION

Viscosity measurement is useful tools for getting information about solute-solute and solute-solvent interactions. Many workers studied interactions of binary mixtures aqueous and non-aqueous solutions in terms of β -coefficient of viscosity by using this measurement. Recently some workers presented the measurement of viscosity, refractivity index. Present paper contains viscosity measurements of Acelofenace were studied at various temperatures.

EXPERIMENTAL SECTION

All chemicals are analytical reagent (AR) grade with were obtained from Sd Fine chemicals, India which

is used as such without further purification. The viscosities were measured by using Oswald's viscometer cleaned and dried, which was kept in thermostatic water bath ($\pm 0.10^\circ\text{C}$) and maintaining each measurement sufficient time was allowed to maintain the temperature variation. The density of solutions were determined by a bicapillary Pyknometer and calibrated with deionised by doubly distilled water. The present study deals with the viscosity measurements of Ligand Acelofenac in 70% dioxane–water mixture at different compositions at 298°K , 300°K and 305°K respectively. The viscometric readings were taken as in literature survey. The results determined were mentioned, A and β -coefficient values calculated in following Table.

Table: Determination of Relative and Specific Viscosities at 70% Dioxane-Water mixture

Temperat ure($^\circ\text{K}$)	Concentration (M)	Time flow (Second)	Density (ρ) g.cm^{-3}	Relative Viscosity η_r	Specific Viscosity $\eta_{sp} = \eta_r - 1$	$\eta_r - 1/\sqrt{C}$	A- coefficient	B coefficient
298 $^\circ\text{K}$	0.100	97.9	1.026 0	1.5865	0.7865	2.58683	2.77	-1.7491
	0.075	95.9	1.0249	1.4913	0.6913	2.62392		
	0.050	94.2	1.0245	1.4226	0.6226	2.73055		
	0.040	91.8	1.0241	1.3503	0.5503	2.78471		
300 $^\circ\text{K}$	0.100	98.9	1.0247	1.5530	0.5530	1.84843	2.03	-1.8851
	0.075	96.9	1.0245	1.4985	0.4985	1.91991		
	0.050	94.2	1.0242	1.4403	0.4403	1.96019		
	0.040	92.8	1.0239	1.3987	0.3987	1.94498		
305 $^\circ\text{K}$	0.100	97.9	1.0243	1.4177	0.4177	1.42058	1.85	-2.8851
	0.075	96.9	1.0240	1.4166	0.4166	1.62085		
	0.050	95.2	1.0233	1.3694	0.3694	1.66059		
	0.040	91.8	1.0229	1.3446	0.3446	1.78100		

RESULT AND DISCUSSION

The relative viscosities have been analysed by Jones-Dole equation $(\eta_r - 1) / \sqrt{C} = A + B \sqrt{C}$ where C is molar concentration of the ligand solution, A is the viscosity coefficient which measures solute-solute interaction and B is viscosity coefficient which measure

solute-solvent interaction. The graphs are plotted between \sqrt{C} versus $(\eta_r - 1) / \sqrt{C}$. The graph for each system showing linear straight line which is validity of Jone's –Dole equation. The slope of straight line gave value of β coefficient. The presence of weak solute-

solvent interaction may be due to strong hydrogen bonding.

CONCLUSION

From the results, it is observed that, the concentration of ligand is directly proportional to density and relative viscosity for ligand at temperature 298°k, 300°k and 305°k for 70% dioxane-water mixture. This may be due to the weak solvation effect which shows weak molecule interaction. The A and β -coefficient values are negative indicating a weak solute-solvent interaction which is good for interactions in between the drug and the drug receptors indicate good drug activity and effect which in favors of pharmacokinetics and pharmacodynamics activity. The density and relative viscosity for ligand is inversely proportional to temperature of solution which shows weak the molecular interactions.

It indicates that when the temperature of dioxane water increases, weak solute-solvent interactions i.e. interaction of ligand (drugs) and dioxane increases, which may be stabilize the drug activity. From this it can be concluded that the drug absorption, drug transmission and drug effect of ligand is more effective at higher temperature of dioxane water.

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