



International Journal of
Medicinal Chemistry & Analysis

www.ijmca.com

e ISSN 2249 - 7587

Print ISSN 2249 - 7595

VISCOMETRIC MEASUREMENTS OF 3-(2-HYDROXY-3-NITRO-5-METHYL) PHENYL-6-AMINO-1,2,5-THIOXAZINE IN 60% ETHANOL WATER MIXTURE AT VARIOUS TEMPERATURES

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ABSTRACT

The present investigation regarding the viscometric measurements of 3-(2-hydroxy-3-nitro-5-methyl) phenyl-6-amino-1,2,5-thioxazine in 60% ethanol water mixture at various temperatures (24^oC, 28^oC, 32^oC and 36^oC) by keeping constant molar concentration 0.1 M. This investigation also includes the study of the solute –solvent interaction and effect of dilution of the solvent. The results obtained during this investigation gave detail information regarding to pharmacokinetics and pharmacodynamics of these drug.

Keywords: Viscometric Measurements, 3-(2-hydroxy-3-nitro-5-methyl) phenyl-6-amino-1,2,5-thioxazine, ethanol-water mixture etc.

INTRODUCTION

Viscosity is a property of fluid to resist the deformation of fluid, each and every liquid has specific value of viscosity. It is important property of liquid which give the information regarding to motion of liquid. Thus viscosity creates their great important in pharmaceutical, medicinal, agricultural, biochemical and drugs sciences [1-4]. In drugs chemistry Viscosity measurements provide the valuable information regarding to solute-solute, solute-solvent, solvent-solvent interactions.

In pharmacodynamic drug stability, absorption, transmission, metabolism and excretion were studied. In drug metabolism, drug activity and its effect were studied. These properties are directly related with viscosity measurements. Absorption, transmission, metabolism and excretion are also depending on viscosity. Prediction of this factor's can be done by viscometric measurements. The activities of the drug like absorption, transmission and its effect will directly relate to viscosity measurements of

the drugs and solvent interactions in the human anatomy [5-11]. The literature survey reveals that most of the people in the world are suffer from various type of serious diseases and the drugs which are the most excellent for particular diseases prove to be non-active for that diseases due to speedy evolutionary phenomenon in pathogens. Thus, it becomes challenge to chemists and researchers to synthesize new type of drug for such diseases. Substituted carboxamide and substituted diphenyl butanamide nucleus containing drug create their own identity and importance in drug and pharmaceutical chemistry.

Accounting all these things it became very interesting to carry out the viscometric measurements of 3-(2-hydroxy-3-nitro-5-methyl) phenyl-6-amino-1,2,5-thioxazine in 60% ethanol-water mixture at various temperatures (24^oC, 28^oC, 32^oC and 36^oC) by keeping constant molar concentration 0.1 M. All these study help to examine the potency of the drug.

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EXPERIMENTAL

All solutions of the drugs were always used freshly in the present study. In these work, all solution prepared by using double distilled water. Mechaniki Zaktady Precyzyjnej Gdansk balance (Poland make [$\pm 0.001\text{gm}$]) was used for weighing. Measured the density by Bicapillary method (Internal diameter of bicapillary is of 1 mm). Viscosity measurements carried out by Ostwald's viscometer. It was kept in Elite thermostatics water bath and temperature variation was maintained at 28°C (± 0.1) for each measurements. Ample time was allowed to attain thermal equilibrium in between viscometer and water bath.

The present study deals with the viscosity investigation of 3-(2-hydroxy-3-nitro-5-methyl) phenyl-6-

amino-1,2,5-thioxazine at 0.1M concentration in 60% ethanol-water system separately at different temperatures (24°C , 28°C , 32°C and 36°C). The viscometric readings were taken as described in literature.

OBSERVATIONS AND CALCULATIONS

Resultant data obtained in viscometric measurements from that tabulated molecular interactions in terms of β -coefficient of drugs. The result obtained was mentioned in Table No. 1. According to Jone's-Dole equation, $(\eta_r - 1)/\sqrt{C} = A + \beta\sqrt{C}$ at different temperatures keeping the concentration 0.1 M. A and β -coefficient values calculated are enlisted in Table No.2.

Table 1. Viscosity Measurements at Different Concentrations and Determination of Relative and Specific Viscosities at Different Temperatures at 0.1 M

Medium - 60% Ethanol-Water							
Conc.	Temp. ($^{\circ}\text{C}$)	\sqrt{C}	Time t (sec.)	Density $\rho \times 10^{-3}$ (kg.cm^{-3})	η_r	$\eta_{sp} = \eta_r - 1$	$(\eta_r - 1)/\sqrt{C}$ ($\text{pa}^{\cdot}\text{s}$)
0.1 M	24	0.316	66	1.0124	0.0916	-0.9084	-2.8747
	28	0.316	73	1.0234	0.0647	-0.9353	-2.9599
	32	0.316	74	1.0358	0.0589	-0.9411	-2.9781
	36	0.315	80	1.0392	0.0412	-0.9588	-3.0341

Table 2. A and β Co-Efficient Values from Graphs for 60%

TABLE – 8 – for -(2-hydroxy-3-nitro-5-methyl) phenyl-6-amino-1,2,5-thioxazine			
W-E Mixture (%)	Temp $^{\circ}\text{C}$	Mean "A"	β (Slope "m")
60	24	-2.9617	0.0102

RESULT AND DISCUSSION

The relative viscosity was determined by using given formula is Jone's-Doles equation has been used for the analysis of relative viscosities. This is given as follow,

$$(\eta_r - 1)/\sqrt{C} = A + \beta\sqrt{C}$$

Draw the graph in $(\eta_r - 1)/\sqrt{C}$ against \sqrt{C} . We get the straight line for each system and the β -coefficient value was determined from these graph.

In present investigation it was observed that the density and relative viscosity decreases along with increasing temperatures. We monitored in the current work that the density and relative viscosity decreases with increases in temperature. This is supported by the information that as the temperature increases the molecular forces of attraction decreases as well as percentage of solvent molecules increases in the solution due to which solvation

effect increases. The influence of this compound can be increased by surrogating different substituent on the parent drug. This solute shows good result hence this can be used as a drug.

ACKNOWLEDGEMENT

It gives me immense pleasure to express my sincere gratitude to Dr. Bhavna Ramteke, for gifting us a valuable compound 3-(2-hydroxy-3-nitro-5-methyl) phenyl-6-amino-1,2,5-thioxazine for this study.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

REFERENCES

1. Semwal HK et al. Electrostrictive solvation of ions. *Journal of Pure Applied Ultrasonics*, 25(6), 2003, 21.
2. Baldaniya BB et al. Synthesis, Antibacterial and Antifungal Activities of s-Triazine Derivatives. *E-Journal of Chemistry*, 6(3), 2009, 673-680.
3. Parajuli R et al. Basicities of some 9-substituted acridine-4-carboxamides: A density functional theory (DFT) calculation. *Journal of Chemical Sciences*, 116(4), 2004, 235-241.
4. Levin RD, *Molecular Reaction Dynamics*, Cambridge University Press, 2005.

5. Tigellar DM et al. Synthesis and Properties of Novel Proton-Conducting Aromatic Poly(ether sulfone)s That Contain Triazine Groups. *Macromolecules*, 42(06), 2009, 1888-1996.
6. Singh J et al. Ultrasonic velocities and isentropic compressibilities of some tetraalkylammonium and copper(I) salts in acetonitrile and benzonitrile. *Journal of the Chemical Society, Faraday Transactions*, 90(4), 1994, 579.
7. Amalendu Pal, Viscometric studies of L-Valine and L-leucine in aqueous solution of NaBr at 298.15K, *Indian Journal Chem.* 44(A), 2005, 1589-1593.
8. Grinnell Jones. The Viscosity of Aqueous Solutions of Strong Electrolytes with Special Reference to Barium Chloride *Journal of American Chemical Society*, 51(10), 1929, 2950-2964.
9. Abd El-Waheb AHF, Bedair AH, Eid FA, El-Haddad AF, Adawy El-deeb AM, El-Sherbiny GM. Binary heterocyclic systems containing the ethylideneamino linkage: synthesis of some new heterocyclic compounds bearing the naphtho-[2,1-b]furan moiety. *Journal of Serbian Chemical Society*, 71(5), 2006, 471-481.
10. Ruijiao Dong et al. Viscometric measurement of the thermodynamics of PAN terpolymer/DMSO/water system and effect of fiber-forming conditions on the morphology of PAN precursor. *Journal of Polymer Science*, 46(19), 2008, 1997-2011.
11. Jumde Kp et al. Viscometric Measurement Of Substituted-Dioxo-Naphthacene-2-Carboxamide And Substituted-Spiro[1-Benzofuran2,1'-Cyclohex-2-Ene]-3,4'-Dione Drugs In Ethanol-Water Mixture At Various Percentage Compositions. *International Journal of Chemical and Physical Sciences*, 2(5), 2013, 26-32.
12. Sohail Aslam et al. Viscometric Measurement Of Chromium(III)-Polyacrylamide Gels. *Chemical Engineering Communications*, 48(4-6), 1986, 287-301.
13. Scott Blair GW et al. Viscometric measurements of the activities of commercial rennets using sodium caseinate as substrate. *Journal of Dairy Research*, 29(01) 1962, 37-46.