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Efficient approach to viscometric measurements of Novel 1-phenyl-3-[4-(2-allylimino-4-allylimino-1,3,5-dithiazino) amino-phenyl] prop-2-ene-1-one in 60% ethanol-water mixture using various temperatures at constant concentration

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ABSTRACT

Recently in laboratory viscometric measurements was carried out of 1-phenyl-3-[4-(2-allylimino-4-allylimino-1,3,5-dithiazino) aminophenyl] prop- 2-ene-1-one at different temperatures by keeping the constant concentration. Also, to determine the effect of dilution of the solvent and the solute-solvent interaction of drug in current times in our laboratory.

Keywords: Ethanol-Water mixture, Viscometric measurements, 1,3,5-Dithiazino etc.

INTRODUCTION

The heterocyclic compounds are very widely distributed in nature and very essential to living organisms. In biochemical, agricultural, pharmaceutical, medicinal, and industrial and drug sciences (Solanki A. and Thakur, 2007; Saleem, 2008). Viscosity measurements play a crucial role. Viscosity is one of the important physical properties of liquid. Due to the shearing effect in the liquid which is the movement of liquid layers over each other hence liquids are viscous in nature (Bhat, 2008). Measurements of viscometric parameter providing important information regarding solute-solute and solute-solvent interaction in an aqueous and in non-aqueous solution. Drug behavior like absorption, transmission and its effect will directly relate to its viscosity measurements and solvent interactions in the human framework (Vibhute and Basser, 2008).

Literature review that chalcone derivatives exhibit diverse pharmacological and biochemical activities (Kalirajan, 2007; Bhat, 2008; Vibhute and Basser, 2008) such as antimicrobial and cytotoxic agents, antiviral, anti-inflammatory, anestetics, mydriatics.

Heterocyclic molecule having 1,3,5-dithiazino nucleus is widely used in medicinal, biochemical, biotechnological and pharmaceutical sciences (Solanki and Thakur, 2007; Saleem, 2008; Bhat, 2008). These compounds showed anti-helminthic, antifungal, antiviral, antibacterial and anti-tuberculostatic properties (Vibhute and Basser, 2008). Dithiazines are found to be effective on treatment of cancer (Wan, 2005). All these facts consideration a topic of great interest to carry out the viscometric measurements of 1-phenyl-3-[4-(2-allylimino-4-allylimino -1,3,5-dithiazino) aminophenyl] prop-2-ene-1-one by varying temperatures (Jakhar and Makrand, 2010) Such kind of study will be helpful to drug effectiveness (Zhang and Zhang, 2003; Solanki and Thakur, 2007; Saleem, 2008).

MATERIAL AND METHODS

A.R. grade chemicals and double distilled water were used for all types of analysis. We used Mechaniki Zaktady Precyzyjnej Gdansk balance (Poland make [±0.001gm]) to weigh our compounds. Ostwald's viscometer was used for measure viscosity of liquid. It was kept in Elite themostatics water bath and temperature variation was maintained at 28^0C (±0.1) for each measurement. Bicapillary with a 1 mm internal diameter was used for determined densities. Maintaining thermal equilibrium in between viscometer and water bath required sufficient time.

Present investigation viscometric study of 1-phenyl-3-[4-(2-allylimino-4-allylimino-1,3,5-dithiazino) aminophenyl] prop-2-ene-1-one at 0.1M concentration in 60% ethanol-water system separately at varying temperatures. In the current study always used freshly prepared solutions of a solute. The viscometric readings were taken as described in literature

RESULTS AND DISCUSSION

Molecular interactions in terms of β-coefficient of solute is figured with the help of data obtained in our work. The results obtained are stated in **Table 1**. According to Jone's-Dole equation, $(\eta r-1)/\sqrt{C} = A+B\sqrt{C}$ at different temperatures keeping the concentration 0.1 M. A and β-coefficient values calculated are enlisted in **Table 2.**

The relative viscosity was determined by using following formula

η_r = Ds x ts / Dw x tw.

While, the relative viscosities have been analyzed by Jone's-Doles equation as ,

$(\eta r-1)/\sqrt{C} = A+B\sqrt{C}$

Where,

A = Falkenhagen coefficient

B = Jones-Dole coefficient

C = concentration of solutions

Table 1: Viscosity measurements at constant concentrations and determination of relative and specific viscosities at different temperatures at 0.1m

MEDIUM - 60% ETHANOL-WATER							
Conc.	**Temp. (°C)**	**√C**	**Time (sec.)**	**Density ρx10³ (kg.cm⁻³)**	**ή$_r$**	**ή$_{sp}$=ή$_r$-1**	**(ή$_r$-1)/√C (pa-s)**
0.1 M	22	0.314	58	1.0913	0.069341	-0.930659	-2.9638
	24	0.314	51	1.0893	0.067329	-0.932671	-2.9702
	28	0.314	47	1.0676	0.05920	-0.9408	-2.9961
	30	0.314	32	1.0565	0.06453	-0.93547	-2.9792

Table 2: a and β co-efficient values from graphs for 60%. For 1-phenyl-3-[4-(2-allylimino-4-allylimino-1,3,5-dithiazino) amino- phenyl] prop-2-ene-1-one

W-E Mixture(%)	Temp° C	Mean "A"	β (Slope "m")
65	24	-2.9702	0.0073

The Falkenhagen coefficient (A) measures the solute-solute interaction while Jones-Dole coefficient (B) measures the solute-solvent interaction.

The graph are plotted in between $(\eta r-1)/\sqrt{C}$ versus$\sqrt{C}$. The graph for each system gave linear straight line gave value of β-coefficient.

CONCLUSIONS

We monitored in the current work that the density and relative viscosity decreases with increase in temperature. This is supported by the information that as the temperature increases the solute-solvent interaction increases due to which solvation effect increases. This investigation useful and informative regarding study of pharmacodynamics and pharmacokinetics of drug.

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