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Impact of Percentage Composition on Viscometric Parameters of Substituted Thiocarbamido-Naphthol at 303 K Temperature

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Abstract
The fields of organic, drug, pharmaceutical, and medicinal chemistry assign unique importance, meaning, and identity to benzenoids and compounds possessing thiocarbamido nucleus. In order to ascertain the impact of structure, group, and other parameters on the pharmacokinetics and pharmacodynamics of the compounds, viscometric studies of 4-p-Tolylthiocarbamidonaphthol and p-phenylthiocarbamidonaphthol were performed at various percentage compositions of solvent. The information gathered from this investigation's data and findings provided specifics about the drugs' effects, activity, and absorption. Keeping all of these factors in mind, this study project was completed.
Keywords:- *Viscometric measurements of p-phenylthiocarbamidonaphthol, 4-p-tolylthiocarbamidonaphtholnol.*

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I. INTRODUCTION

Viscosity is the measure of a liquid's internal friction. Research on viscosity is essential to the fields of drug chemistry, medicine, and pharmaceuticals[1-3]. Viscometric measurements provide important and useful information about interactions between solutes and solvents, as well as between solutes and solute-solvents, in medicinal chemistry. Viscosity measurements of the solute (drug) and solvent interactions in the human anatomy will directly relate to drug absorption, transmission, activity, and effect. Thus, considering everything and keeping in mind that this laboratory is being used more broadly to synthesize nitrogen, sulfur, and heteroacycles and heterocycles containing nitrogen and sulfur, it was deemed interesting to perform the viscometric measurements of *p*-phenylthiocarbamidonaphthol and 4-*p*-tolylthiocarbamidonaphthol. The potency and stability of substituted thiocarbamidonaphthols are investigated in this work, along with renovations and modifications to conventional medications utilized by medical professionals.

Drugs containing benzenoid and thiocarbamide nuclei have developed a unique identity and importance in drug and pharmaceutical chemistry[4-10]. Therefore, viscosity measurements of *p*-phenylthiocarbamidonaphthol and 4-*p*-phenylthiocarbamidonaphthol were performed to study the efficacy of recently synthesized drugs in this laboratory. Tolylthiocarbamidonaphthol was carried out. Different proportions of the composition were tested. This study is a milestone in the medical and drug development of substituted thiocarbamide phenols.

II. EXPERIMENTAL

All chemicals used were A.R grade and double distilled water was used. Weighing was performed on a Polish Mechaniki Zaktady Precyzyjnej Gdansk balance ±(0.001 g). The density of the solution was determined using a bicapillary hydrometer (≥ 0.2%) with a sphere volume of approximately 10 cm^3 and a capillary tube of 1 mm internal diameter and calibrated with deionized double-distilled water. The accuracy of the density measurements was 0.1± kgm^{-3}. Viscosity was measured using a thoroughly cleaned and dried Ostwald viscometer. The viscometer was maintained in an Elite constant temperature water bath, and the temperature change for each measurement was maintained at 30 °C (±0.1). Sufficient time was allowed to reach thermal equilibrium between the viscometer and the water bath.

Observation and calculation:-

This study deals with the viscosity investigation of ligand *p*-phenylthiocarbamidonaphthol and ligand 4-*p*-Tolylthiocarbamidonaphthol in 60%, ethanol–water mixtures at different compositions and 30 °C. The obtained data were used to calculate the molecular interaction coefficients of various ligands. Viscosity measurements were performed as described in Ref. 11. The results obtained are shown in Table No. 1-3.

According to the Jones-Dole equation, for different concentrations and different percentages, C =A+√r-1) η(C.√β The values of A and β coefficients are calculated and shown in Table No.3.

III. RESULT AND DISCUSSION

The relative viscosity was determined using the given formula. The relative viscosity was analyzed using the Jones-Doles equation. This is given as: (ηr-1)/√C = A+β√C Draw a graph of (ηr-1)/√C versus √C. We obtained straight lines for each system and determined the value of the β coefficient from these graphs. In this study, we observed that the density and relative viscosity decrease with increasing temperature. In the present study, we observed that the density and relative viscosity decrease as the percentage of solvent composition increases. This is supported by the information that as the composition percentage of the solvent increases, the molecular attraction decreases and the percentage of solvent molecules in solution increases, thereby increasing the solvation effect. Tables 3 show that as the composition ratio of ethanol and water increases, the values of A and β coefficients decrease. *p*-phenylthiocarbamidonaphthol has lower A and β coefficient values than 4-*p*-Tolylthiocarbamidonaphthol. The effect of this compound can be increased by substituting another substituent on the parent drug. From this study, it was concluded that *p*-phenylthiocarbamidonaphthol can be used as a medicine because it produces better results than 4-*p*-Tolylthiocarbamidonaphthol.

Measurement of relative and specific viscosity at various concentrations

A] For *p*-phenylthiocarbamidonaphthol

Table No 1:- Temp-303 K Medium:-Ethanol-water (60%)

Conc. C (M)	**√C**	**Time t (sec.)**	**Density ρx10^3 (kg.cm^{-3})**	**$\acute{\eta}_r$**	**$\acute{\eta}_{sp}=\acute{\eta}_r-1$**	**$(\acute{\eta}_r-1)/\sqrt{C}$ (pa˙s)**
0.100	0.31619	59.79	0.9556	2.4632	1.4632	4.6291
0.050	0.22357	38.85	0.9552	1.6001	0.6001	2.1928
0.025	0.15808	55.56	0.9442	2.2616	1.2616	5.3347
0.0125	0.11177	56.25	0.9515	2.3074	1.3074	6.3850

B] For 4-*p*-Tolylthiocarbamidonaphthol

Table No 2 :-Temp-303K Medium:-Ethanol-water (60%)

Conc. C (M)	**√C**	**Time t (sec.)**	**Density ρx10^3 (kg.cm^{-3})**	**$\acute{\eta}_r$**	**$\acute{\eta}_{sp}=\acute{\eta}_r-1$**	**$(\acute{\eta}_r-1)/\sqrt{C}$ (pa˙s)**
0.100	0.31619	56.90	0.9571	2.3409	1.3409	4.2417
0.050	0.22357	53.71	0.9565	2.2116	1.2116	5.4196
0.025	0.15808	57.61	0.9547	2.3753	1.3753	8.7005
0.0125	0.11177	57.26	0.9539	2.3601	1.3601	12.1677

A-β Coefficient value according to Jone's –Dole Equation at different concentrations and different percentage

Table No 3:- Temp-303K Medium:-Ethanol-water

System	% Ethanol -Water	A- coefficient	β- coefficient
***p*-phenylthiocarbamidonaphthol**	60	5.2756	-0.0316
4-*p*-Tolylthiocarbamidonaphthol	60	7.3358	-0.2117

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