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Study of the Potency of Newly Synthesized Substitutedthiocarbamido Naphthol by Conductrometrically

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Abstract

To develop more potency drugs because pathogens become more active than previous one. Many chemists and researchers have received a great attention in the view of human susceptibility and protection of environments. As per the need of this generation they synthesized many compounds and molecules and prime to assess their significances and applications in various fields. Conductometric study received more values. Conductrometric investigation developed an interconnecting link in between to chemical science and life sciences. Consider above fact in mind present research scheme designed as to study the potency of 5-phenylthiocarbamido-1-naphthol at mixed solvent media. In which determined the conductrometric parameters and thermodynamics parameters of 5-phenylthiocarbamido-1-naphthol at different concentrations and 308 K in 60% ethanol-water mixture. Present work helps to understand different interactions like solute-solvent interaction, solute-solute interaction, solute-solvent-solvent interaction and solute-solute-solvent interaction that are used in present work. This study helps to understand Pharmacodynamics of the newly synthesized molecules.

Keywords: 5-phenylthiocarbamido-1-naphthol, conductrometric parameters thermodynamic parameters and Conductometric study.

Introduction:

Mobility of ions in electrolytic solution is known as conductivity. As drugs activity point of view mobility of ions received more values because it concerns to the conductivity ion in solution that also helps to understand the dissociation of solute in solvent. Dissociation of solute also called as ionization of solute that influence the mobility and bioavailability of solute ions. Conductivity of drug helps to understand the pharmacodynamics of drug. Mobility of ions is also treated as transmission of ions. Ionic transmissions of electrolyte in electrolytic solution strongly influence on solubility and permeability of drugs efficiently. Solubility and bioavailability are contributing biopharmaceutical parameters and which are measurably hamper on accountable for effective bioavailability and good in vitro and vivo correlation[1]. Nowadays researchers are mainly concentrating to enhance the solubility and dissolution rate and oral bioavailability of weakly water soluble drugs[2]. Hydrotropic Salivation method considered as one of the sophisticated methods which is contributed in solubalisation[3.] Many researchers were paid their devotion to enhance the aqueous solubalisation of insoluble drugs by adding specific hydrotropic agents [4,5]. Conductrometric investigation provided valuable information concern to solute-solute and solute-solvent interaction [6]. Ionic association of divalent asymmetric electrolyte $Cu(NO_3)_2$ with Kryptofix-22 in mixed (MeOH-DMF) solvents at different temperatures by conductometric measurements was studied by Gomaa and Al-Jahdalli[7]. Izonfuo and Obunwo[8] and Roy et al[9] was investigated many alkalis metal at different proportion of mixed solvents by conductometrically. Some researchers paid their attention to understand thermodynamic parameter and Walden product of different complexes and they also examine the comparison of transition metal complexes among the halide group[10-14]. Singh et al[15]

investigated the ion pair formation and thermodynamic parameters of Glycine Bis-1-amidino-O-methylurea cobalt (III) halides in water-methanol mixture at different temperatures. Considering these above facts present research work designed to determination of thermodynamic parameters (viz. ΔH; ΔS and ΔG) and conducctometric parameters of 5-phenylthiocarbamido-1-naphthol conductometrically at different concentrations and 308 K in 60% ethanol-water mixture. This study helps to understand the various inter and intra molecular interaction like solvent-solvent, solute-solvent and solute-solute-solvent interactions. That information helps to understand the pharmacodynamics of newly synthesis molecule.

Experimental:

Freshly prepared solutions are used through current work. All AR grade chemicals are used through present analysis. The solvents were purified by standard method before used. To prepared 0.01M, 0.005M, 0.0025M and 0.0012M concentrations of 5-phenyl thiocarbamido-1-naphthtol 60% ethanol-water mixture. Thermal equilibrium maintained at temperatures 308 K) of drugs solution by using thermostat respectively. Conductivity measured for each concentration solutions after getting thermal equilibrium.

Result and Discussion:

Prepared the solution of 0.01 M concentration of 5 phyenylthiocarbamido-1-naphthol then by using serial dilution method prepared solutions of 0.005M, 0.0025M and 0.0012M with 60% ethanol-water mixture respectively. To measured conductance for each solution by using Conductivity Bridge at 308 K. The obtained result tabulated in given in Table-1 and Table-2. Observed conductance (G), specific conductance (k) and molar conductance (μ) were examined with helps of known literature method from resultant data.

Table 1: Conductometric measurements at different concentrations of 5-phenylthiocarbamido-1-naphthol

DETERMINATION OF G, k and μ AT DIFFERENT CONCENTRATIONS IN 60% E-W MIXTURE AT 308K.				
Temp	**Concentration C (M)**	**Observed conductance (G) mS**	**Specific conductance (k) mSm^{-1}**	**Molar conductance (μ) mSm^2mol^{-1}**
308 K	0.01	0.02608	0.003084×10^{-3}	0.308459
	0.005	0.01502	0.001848×10^{-3}	0.369775
	0.0025	0.01064	0.001365×10^{-3}	0.546262
	0.0012	0.00912	0.001147×10^{-3}	0.956425

Observed conductance (G), specific conductance (k) decreases and molar conductance (μ) values are tabulated in Table 1. Here G, k and μ increases along with decreasing concentrations and G, k and μ increases along with increasing temperatures. The specific conductance increases with increasing temperature. Calculated values the specific constant (Ksp), log (Ksp) and thermodynamic parameters viz. (ΔG), (ΔS) and (ΔH) of 5-phenylthiocarbamido-1-naphthol by known literature methods at different concentration with different temperatures. Obtained result computed in **Table 2**.

Table 2: Conductometric measurements at different concentration and differents temperatures of 5-phenylthiocarbamido-1-naphthol

DETERMINATION OF Ksp, log Ksp, ΔG,ΔH and ΔS AT DIFFERENT CONCENTRATIONS AT 308K.						
SYSTEM: L_2 [PTCN]			MEDIUM - 60% Ethanol-Water Mixture			
Temp.(K)	**Conc. M**	**Ksp**	**Log Ksp**	**ΔG kJmlo^{-1}**	**ΔH kJmlo^{-1}**	**ΔS kJK^{-1}mlo^{-1}**
308 K	0.01	0.02595	-4.58698	-27050.89	-88354.6	374.693
	0.005	0.009301	-5.03156	-29672.72	-96917.5	411.007
	0.0025	0.00507	-5.29469	-31224.49	-101986	432.5
	0.0012	0.003584	-5.44571	-32115.1	-104895	444.837

Conclusion:

From above table -1 and 2 it is concluded that the variation in molar concentrations closely related to conductrometric and thermodynamic parameters values of 5-phenylthiocarbamido-1-naphthol. As observed, the μ values increase with decreasing in concentration that indicates less solvation or higher mobility of ions. This is due to the fact that greater bond breaking due to dilution. Also negative values of ΔG indicated the reaction is spontaneous. Negative values of enthalpy change (ΔH) suggested the reaction is exothermic. Favorable at lower temperature and positive value of (ΔS) revels entropically favorable. The change in thermodynamic parameters values closely affected by molar concentrations and percentage compositions. Also, solute (drug)-solvent interactions, solvent-solvent interactions, solvent-solvent-solute interactions and –solute-solute-solvent interactions considerably effect on these parameters. Internal geometry as well as internal and intra hydrogen bonding are also responsible for the variation of these parameters.

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