

Interferometric study of some substituted Schiff bases in polar and Non-polar pure solvents.

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Abstract-

The Ultrasonic velocities, Apperent molal Compressibilities, Adiabatic Compresibilites , Apperent molal Volume, Intermolecular free length , Relative association in polar and Non-polar solvents.

Keywords- Ultrasonic Velocity , Appernt molal volume, Schiff base , Polar and Non-polar solvent.

Introduction- Nowadays Ultrasonic waves are used to study of structure and properties of matter, testing of materials mechanical cleaning surface in the field of technology. In medical sciences the wave are being used to detect bone fracture , bloodless surgery, and so on. The ultrasonic waves are mostly used in forensic science and space reaserch. Many Reaserchers reported the physic-chemical properties of Schiff bases¹⁻³.Acoustical studies of some Schiff bases in 1,4,Dioxane and Dimethyl formamide at 318.15k⁰.⁴.Ultrasonic speed and related acoustical parameters of symmetrical double Schiff bases of 4-aminophenol in DMSO solution on the data density ,viscosity and ultrasonic sound speed at 308.15 k⁰⁶ . Acoustical investigation of N-(2-hydroxybenzylidene)-3-substituted pyridine-2-amine Schiff bases by ultrasonic velocity measurements in Di-oxane at different tempretures⁷. The present work deals with the study of acoustic parameters like the ultrasonic velocities(Us), Adiabatic compresibilitiy(β_s), Apperent molal volume (ϕ_v), and Intermolecular free length (Lf), Specific acoustic impedance(Z), Relative association(RA), in polar and Non-polar solvent.

Experimental- In the present investigation a variable path ultrasonic interferometer Model Mx-3 was used to measure the ultrasonic velocity in liquid mixture and solution having frequency 2MHz with accuracy at $\pm 0.03\%$. The densities of the solution were determined by standardize capillary pyknometer having an integral diameter of 1mm. All the weighing was made on one pan digital balance. 1,3,5-trihydroxy-benzoamido-4-bromo-imine is synthesized in the laboratory preferring microwave radiations. The solvent Acetone and THF is used.

Table-1**System-1,3,5-trihydroxy-benzoamido-4-bromo-imine****Ultrasonic Frequency = 2Hz****Medium – THF**

Molality	0.01	0.05	0.0025	0.00125	0.00063
us	2243	2130	2127	2113	2118
ds	1.1697	1.1594	1.1492	1.1388	1.1292
β_s	1.699E-05	1.901E-05	1.923E-05	1.967E-05	1.974E-05
Lf	1.249	1.321	1.329	1.344	1.346
z	2623.64	2469.52	2444.35	2406.28	2391.65
RA	1.0664E-03	1.075E-03	1.066E-03	1.059E-03	1.049E-03
Δv	85629	17480	347870	701845	1404150
$\Delta k(s)$	1.45699	0.33273	6.69962	13.82145	27.75523

Table-2**System-1,3,5-trihydroxy-benzoamido-4-bromo-imine****Ultrasonic Frequency = 2Hz****Medium – Acetone**

Molality	0.01	0.05	0.0025	0.00125	0.00063
us	1495	1476	1452	1435	1409
ds	1.076	1.075	1.073	1.0621	1.0512
β_s	4.158E-05	4.270E-05	4.420E-05	4.572E-05	4.792E-05
Lf	1.954	1.980	2.015	2.049	2.097
z	1608.62	1586.70	1558.00	1524.11	1481.14
RA	1.1230E-03	1.127E-03	1.131E-03	1.124E-03	1.119E-03
Δv	93095	18854	372606	752595	1508472
$\Delta k(s)$	3.87578	0.80600	16.49087	34.45190	72.36790

Result and Disussion-

The values of Apparent molal volume and Adiabatic compressibilities of 1,3,5-trihydroxy-benzoamido-4-bromo-imine used to discuss the interactions of unlike molecule of solvent in presence of solute. The Apperent molal volume are found to be increasing with decreasing the concentration of solution. Also Ultrasonic velocity decreasing the concentration of solution. The free length increase on decreasing concentration. This indicates that the weak interaction between ion and solvent . It implies less number of free ion means weak ion-ion interactions