ABSTRACT

Chapter I expressed detail study about some biologically active compounds there importance on living body with special reference. This chapter throw a light on water activity, solvent effect and preferential solvation, solute-solvent and solute-solute interactions. The Objectives of the present research work on biologically active compounds have also been briefly discussed in this chapter.

Chapter II depicted a brief of theoretical background of the present works included in this thesis. In that chapter different type equation and parameters and their uses to understand the solute-solvent interaction phenomena are discussed.

In chapter III, Various experimental methods that have employed for the calculation of the numerous properties such as viscosity, ultrasonic sonic sound velocity, density, refractive index *etc*., have been mentioned. In this chapter working principle of some instrument that used to calculate the above said data are also discuss. Purity of chemicals and its source of purchasing are also discussed.

In Chapter IV, Apparent molar volumes (ϕ_V) and viscosity *B*-coefficients for L-Leucine and L-Proline in (0.001, 0.003, and 0.005) mol · kg^{-1} aqueous tetrabutyl phosphonium p-toluene sulphonate solutions have been determined from solution density, ρ, and viscosity,η, measurements at (298.15, 303.15, and 308.15) K as a function of the concentration of L-Leucine and L-Proline. The limiting apparent molar volume (ϕ_V^0) and experimental slopes (S_V^*) obtained from the Masson equation have been interpreted in terms of solute-solvent and solute-solute interactions, respectively. The viscosity data were analyzed using the Jones-Dole equation, and the derived parameters *A* and *B* have also been interpreted in terms of solute-solute and solute-solvent interactions, respectively, in the mixed solutions. The refractive index(nD), molar refraction (R_M), reported.

Chapter V, In this chapter solvation consequences of the caffeine and paracetamol in aqueous uracil solution is studied in terms of viscometric and volumetric property. The standard partial molar volume (ϕ_V^0) and the slope (S_V^*) were calculated from Masson equation and viscosity *B*-coefficient were measured from Jones-Dole equation and these employed to express the different type of

interactions found in the solutions mixture. The activation parameters of viscous flow for the solutions mixture were also measured and expressed by the transition state theory applications.

Chapter VI The inspection of molecular interaction widespread in Allopurinol and in aqueous solutions of α-, β- and HP-β-cyclodextrin have been probed by thermophysical properties. The established complexes obtained were found to be hold with 1:1 stoichiometry. Role of solvent (aqueous solution of α-CD, □-CD, HP-β-CD) and contribution of solute–solute and solute–solvent interactions to solution complexes, have also been analyzed via stability constant-NMR, UV, Steady state Fluorescence, FTIR, HRMS, SEM, PXRD, Cytotoxicity, Hydrophobic effect, Hydrogen-bonding, structural effects in creation of inclusion complexes.

Chapter VIII The apparent molar volume (ϕ_V) of salicylaldehyde anil zinc(II) (abbreviated as SAZ) in N,N-Dimethylformamide (DMF), Dimethyl sulphoxide (DMSO) have been calculated from the measured experimental data on density at temperature, T= (298.15, 303.15, 308.15, 313.15 and 318.15) K. The partial molar volumes at infinite dilution, ϕ_V^0 and viscosity B-coefficients were also calculated. Again, apparent molar volume and density data were used to determine isobaric partial molar expansibilities (ϕ_E^0) and temperature dependence of ϕ_E^0 at constant pressure, $(\partial \phi_E^0 / \partial T)_P$ of experimental solutions to study the different types of interactions in different solvents. The overall results indicate strong solute-solvent interactions of SAZ in both the solvents and hence SAZ acts as a net structure breaker in both the solvents.

Finally this thesis is end up with the conclusion in chapter no VIII with some remarks of the present work.