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Title of Thesis: Physico-Chemical behaviour of Amino acids and Dyes in Aqueous Solutions of Surfactants.

Abstract

Chapter I comprises the statement of the problem, importance of the work and an exhaustive and systematic review of literature on the volumetric, viscometric, refractive index, surface tension and conductance studies of the aqueous surfactant. Thus, clearly emphasizes the need of the work.

Chapter II deals with the experimental details, i.e., standard methods of purification of the chemicals and details of the instruments and techniques used in the present study. For measurement of densities single stem capillary pycnometer has been used, viscosities were measured by using Cannon Ubbelohde viscometer, refractive indices were measured using Abbe refractometer, Surface tension were measured using tensiometer and conductivity bridge has been employed for measurements of conductance.

Chapter III This chapter deals with the density, ρ , and viscosity, η , of glycine, dl-alanine, dl-serine, and dl-valine have been measured in aqueous sodium dodecyl sulphate (SDS) at different temperatures. These data have been used to calculate the apparent molar volume, \bar{V}_2 , infinite dilution apparent molar volume, \bar{V}_2^0 , and the standard partial molar volumes of transfer, $\Delta_{tr}\bar{V}_2^0$, of the amino acids from water to the aqueous SDS solutions. Falkenhagen coefficient, A , Jones – Dole coefficient, B , free energies of activation per mole of solvent (aqueous SDS), $\Delta\mu_1^{o*}$, and per mole solute (amino acids), $\Delta\mu_2^{o*}$, enthalpy, ΔH^* , and entropy, ΔS^* , of activation of viscous flow were evaluated using viscosity data.

Chapter IV This chapter deals with the density (ρ) and viscosity (η) measurements have been carried out on, dl-alanine, dl-valine, dl-phenylalanine CTAB at 298.15, 303.15, 308.15, and 313.15K. The measured values of density and viscosity were used to estimate some important parameters such as apparent molar volume \bar{V}_2 , partial molar volume \bar{V}_2^0 ,

transfer volume $\Delta_{tr}\overline{V}_2^0$, viscosity A and B-coefficients, free energy of activation per mole of solvent $\Delta\mu_1^{0*}$ and solute $\Delta\mu_2^{0*}$, enthalpy, ΔH^{0*}_2 , and entropy ΔS^{0*}_2 of activation of viscous flow of the amino acids.

Chapter V This chapter deals with the density (ρ) and viscosity (η) measurements have been carried out on, dl-Alanine, dl-Valine, dl-phenylalanine in aqueous TX-100 have been measured at 298.15, 303.15, 308.15, and 313.15K. The measured values of density and viscosity were used to estimate some important parameters such as apparent molar volume \overline{V}_2 , partial molar volume \overline{V}_2^0 , transfer volume $\Delta_{tr}\overline{V}_2^0$, viscosity A and B-coefficients, free energy of activation per mole of solvent $\Delta\mu_1^{0*}$ and solute $\Delta\mu_2^{0*}$, enthalpy, ΔH^{0*}_2 , and entropy ΔS^{0*}_2 of activation of viscous flow of the amino acids.

Chapter VI Conductance and Surface tension of sodium dodecyl sulphate (SDS) in aqueous tartrazine over the various composition ranges of surfactant at 298.15, 308.15 and 313.15K have been measured. The experimental data have been correlated against temperature and concentration using standard relations. The measured data were used to calculate various useful thermodynamic parameters, like standard free energy of micellization, ΔG°_{mic} , standard free energy values of adsorption, ΔG°_{ad} , the enthalpy of micellization, ΔH°_{mic} , the entropy of micellization, ΔS°_{mic} , enthalpy of adsorption ΔH°_{ad} and entropy of adsorption ΔS°_{ad} , effectiveness, π_{cmc} , maximum surface excess concentration, Γ_{max} at cmc, and minimum surface area A_{min} , of the SDS- aq. tartrazine solution.

Chapter VII Specific conductance and Surface tension of 1.6×10^{-4} , 3.2×10^{-4} , 6.4×10^{-4} , 8.0×10^{-4} , 9.6×10^{-4} , 11.2×10^{-4} , 12.8×10^{-4} , and 14.4×10^{-4} m cetyltrimethyl ammonium bromide (CTAB) in 0.01m aqueous tartrazine at 298.15, 303.15 and 308.15K have been measured. The experimental data have been correlated against temperature and concentration using standard relations. The measured values have been used to calculate various useful thermodynamic parameters, like standard free energies of micellization, ΔG°_{mic} , enthalpies of micellization, ΔH°_{mic} , entropies of micellization, ΔS°_{mic} , surface pressure at cmc, π_{cmc} , the maximum surface excess, Γ_{max} at cmc, minimum surface area A_{min} , standard free energy of micellization by surface tension method, (ΔG°_{mic}), and standard free energy of adsorption (ΔG°_{ads}) of dye - surfactant mixtures.