Interaction of Some Amino Acids with Sodium Dodecyl Sulphate in Aqueous Solution at Different Temperatures

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The density \( \rho \), and viscosity \( \eta \) of 0.00, 0.05, 0.10, 0.15, and 0.20 mol kg\(^{-1} \) glycine (Gly), dl-alanine (Ala), dl-serine (Ser), and dl-valine (Val) have been measured in 0.002 mol kg\(^{-1} \) aqueous sodium dodecyl sulphate (SDS) at 298.15, 303.15, 308.15, and 313.15 K. These data have been used to calculate the apparent molar volume \( \phi_v \), infinite dilution apparent molar volume \( \phi_v^\circ \), and the standard partial molar volumes of transfer \( \phi_v^{\circ} \)\((_{tr}) \), 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) \( \Delta \mu_1^{\circ\ast} \), and per mole solute (amino acids) \( \Delta \mu_2^{\circ\ast} \), also enthalpy \( \Delta H^\ast \) and entropy \( \Delta S^\ast \) of activation of viscous flow were evaluated using viscosity data. The molar refraction \( R_D \) was calculated by using experimental values of the refractive index \( n_D \) of the systems. The results have been interpreted in terms of ion-ion, ion-polar and hydrophobic-hydrophobic group interactions. The volume of the transfer data suggest that ion-ion interactions are predominant.

Key words: Density; Viscosity; Refractive Index; Amino Acids.