**Probing inclusion complexes of HPβCD with amino acids by physicochemical specification**

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**ABSTRACT**

Density (ρ), viscosity (η) and surface tension (γ) of some amino acids (alanine, glycine, and valine) in different mass fraction of aqueous hydroxypropyl-β-cyclodextrin (HPβCD) mixtures (0.002, 0.004, 0.006, 0.008, 0.009) have been measured at different temperatures (278.15, 283.15, 288.15, 293.15, 295.15 K). The formation and comparative study of inclusion complexes have been analyzed by available data supplemented with γ, ρ, η. The ρ and η values have been utilized to evaluate amounts of the apparent molar volume (), limiting apparent molar volume (), experimental slope (), limiting apparent molar expansibilities (), Activation energy (E), kinematic viscosity (υ), relative viscosity (), intrinsic viscosity (), spatial viscosity () and dynamic viscosity (η) of the systems studied. The surface tension studies confirm that the inclusion complexes have been formed with 1:1 stoichiometry. All the parameters support the formation of the inclusion complexes that were clarified based upon hydrophobic effects, H-bonds, electrostatic forces and structural effects. The findings represent the formation of the inclusion complexes and thus the current work describes its proportion towards various applications as a controlled delivery system in the field of modern bio-medical sciences.

**Keywords**: Density, Dynamic viscosity, Activation energy, kinematic viscosity, Amino acid, HP-β-cyclodextrin.