Dissociations constants and Association thermodynamic functions of glycine acid in Dimethyl formaide mixtures from conductance measurements

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Abstract

The dissociation of glycine in Dimethyl formamide mixtures over the temperature range 293.15-308.15 K , has been studied by direct conductance measurements. The acid dissociation at each temperature was investigated at solvent composition (X2) involving 0.141.

The conductance measurements enabled the estimation of the degree of the acid dissociation, the molar conductivity of the acid at infinite dilution and the activation energy for the movement of cation and anion ions the solvent mixture at infinite dilution .

The resulting data have been used to determine the dissociation constant and the associated thermodynamic functions for the acid dissociation in the solvent Mixture. At any temperature in the range 293.15-308.15 K.

The pKa_1 and pKa_2 increased with increasing temperature.

Introduction:

The study of solutions is of great importance because most of the interesting and useful chemical and biological processes occur in liquid solutions. All biological and many chemical systems are aqueous solutions containing various ions. The stability of biomolecular and the rate of many biochemical reactions are very much dependent on the type and concentration of ions present. It is important to have at least qualitative understanding of the behaviour of ions in solutions [1,2] .

The study of the behaviour of the amino acids in aqueous solutions is useful models for understanding the thermodynamics behaviour of proteins[3,4] .The physical and chemical properties of proteins are determined by its constituent amino acids [5] .

The structure of an amino acid in solution various with the pH of the solution, amine and carboxylic acid have conjugate acid-base forms in water that are dependent upon the pH of solution in which find themselves [6]

The study of the dissociation constant and the associated thermodynamic properties of acid mean of investigating the change in the solute-solvent interaction patterns that are attributed to the variation of the solvent composition. We have accordingly undertaken the dissociation of glycine in Dimethyl formamide mixture at various temperatures from direct conductance measurements.

There is a lack of knowledge regarding the dissociation of glycine in Dimethyl fromamide mixtures despite numerous studies on the dissociation and thermodynamic properties of the acid in a number of other solutions [6] .

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