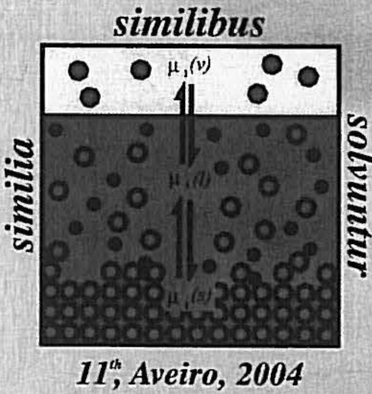
11th INTERNATIONAL SYMPOSIUM ON SOLUBILITY PHENOMENA

Including Related Equilibrium Processes

Abstracts



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Electrolyte Effect on the Solubility of Amino Acids in Aqueous Solutions

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The precipitation and crystallization of biomolecules have been widely used for their separation and concentration.[1] The presence of electrolytes in solution may affect significantly the solubilities of biochemicals, which has been used for salt-induced separation of proteins.[2] Although amino acids are among the simplest biochemicals, they have many similarities with more complex biochemicals and are the building block of proteins. So, the study of the electrolyte effect in the solubility of amino acids in water is a good starting point for further developments.[3]

Although some studies have been published concerning the measurement and thermodynamic properties modelling of aqueous solutions of amino acids with electrolytes, the information available is very scarce. Therefore, in this work, the solubility of Glycine and DL-Alanine were measured in the temperature range between 25 and 60 °C for aqueous systems of KCl, Na_2SO_4 and $(NH_4)_2SO_4$, salts most often used in industrial separation processes.[4] A comparison is given with values recently published in the literature.[1] It was possible to find out big discrepancies, and for the solubility of DL-Alanine in aqueous solutions an inverse dependence with the concentration of the KCl salt was obtained.

The new experimental data were used together with information already available concerning the activity coefficients[5,6] and solubilities, to explore the capabilities of a modified Wilson model,[7,8] recently developed in our group, for the thermodynamic description of these complex systems. Despite the difficulties that arose for the description of these highly non-ideal systems, the results shown are satisfactory for the correlation of the solubilities.

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