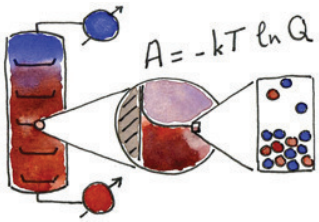

THERMODYNAMICS *2013*

3 - 6 September 2013
The University of Manchester

MANCHESTER 1824
The University of Manchester

BOOK OF ABSTRACTS

CONTENTS

Effect of KCl and $(NH_4)_2SO_4$ on the solubility of four amino acids in water at 298.15 K

Olga Ferreira, Carina Silva, Simão Pedro Pinho

LSRE – Laboratory of Separation and Reaction Engineering,

Instituto Politécnico de Bragança, Campus de Santa Apolónia,

Apartado 1134, 5301-857 Bragança, Portugal

Corresponding author e-mail: spinho@ipb.pt

1. Introduction

Amino acids (AA) are very important biomolecules, not only for their intrinsic pharmaceutical value, but also, as the building blocks of proteins. The study of their solubility in aqueous electrolyte solutions can therefore be useful for the design of separation processes and, also, be related to protein chemistry, providing an important insight into the interactions present in those complex solutions. Previous studies were focused on the effect of salts in the solubility of glycine, DL-alanine, L-isoleucine, L-threonine and L-serine [1-3]. This work extends that analysis to four additional AA, containing two carboxylic groups or the aromatic ring.

2. Main results and conclusions

The solubility of L-aspartic acid, L-glutamic acid, L-tyrosine and L-tryptophan in aqueous solutions of ammonium sulphate or potassium chloride was measured, at 298.15 K, up to 2 molal in salt concentration. To perform the measurements, the isothermal shake-flask method was applied, followed by quantitative analysis by gravimetry or UV spectrophotometry [1,4].

The experimental information obtained here and in previous work [1-3] can contribute, particularly, to extend the knowledge on the effect of different functional groups, relating it to the salt effect on protein precipitation.

References

[1] L.A. Ferreira, E.A. Macedo and S.P. Pinho, *Ind. Eng. Chem. Res.,* 44, 8892-8898 (2005)
[2] L.A. Ferreira, E.A. Macedo and S.P. Pinho, *Fluid Phase Equilibr.,* 255, 131-137 (2007)
[3] L.A. Ferreira, E.A. Macedo and S.P. Pinho, *J. Chem. Thermodyn.,* 41, 193-196 (2009)
[4] O. Ferreira and S.P. Pinho, *Ind. Eng. Chem. Res.,* 51, 6586-6590 (2012)