DECHEMA
Biotechnologie

BOOK OF ABSTRACTS

September 5 – 8, 2010 · Bologna/Italy

ESBES
8th European Symposium on Biochemical Engineering Science

ISPPP
30th International Symposium on the Separation of Proteins, Peptides and Polynucleotides

ISB
3rd International Symposium on Biothermodynamics

EUROPEAN FEDERATION OF BIOTECHNOLOGY

www.dechema.de/BEST2010

MONDAY, 6 SEPTEMBER 2010		AFTERNOON
Room:	Sala Azzurra	Page
	BIOTHERMODYNAMICS	
	Thermodynamics of Biomolecules	
Chair:	*H.P. Jennissen, University of Duisburg-Essen/D*	
15:00	**A molecular-level methodology for elucidating solvent effects on protein thermodynamics** V. Vagenende, Bioprocessing Technology Institute, Singapore/SGP; B.L. Trout, Massachusetts Institute of Technology, Cambridge, MA/USA	88
15:20	**Thermodynamics of radicicol binding to human Hsp90 alpha and beta isoforms** A. Zubriene, D. Matulis, Institute of Biotechnology, Vilnius/LT	89
15:40	**Affinity interactions under chaotropic conditions: a kinetic and thermodynamic study** R. Ueberbacher, E. Berger, A. Jungbauer, R. Hahn, University of Natural Resources and Applied Life Sciences Vienna/A	90
16:00	**Controlling the loading process of polymeric particles** J. Mamic, S. Enders, Technische Universität Berlin/D	91
16:20	Coffee Break	
	Thermodynamics of Biomolecules	
Chair:	*G. Sadowski, Technische Universität Dortmund/D*	
16:50	**Thermodynamics of oligosaccharide separation from crude mixtures** S. Chilamkurthi, L.A.M. van der Wielen, M. Ottens, Delft University of Technology/NL	92
17:10	**Solubility of nutraceuticals in pure and mixed solvents** O. Ferreira, S.P. Pinho, Instituto Politécnico de Bragança/P	93
17:30	**Real-time kinetics of the binding of recombinant human bone morphogenetic protein (rhBMP-2) on ultra-hydrophilic quartz glass** M. Meißner, H.P. Jennissen, University of Duisburg-Essen/D	94
17:50	**Effect of organic solvents on the binding of competitive inhibitor proflavin and storage stability of alpha-chymotrypsin** V.A. Sirotkin, I.A. Komissarov, E.V. Dudkina, Kazan State University/RUS	95
18:10	**Poster Session 1 & Poster Party till 19:30** **(M3C Working Group Meeting)**	

Solubility of Nutraceuticals in Pure and Mixed Solvents

*Olga Ferreira; Simão P. Pinho**

LSRE – Laboratory of Separation and Reaction Engineering, Departamento de Tecnologia Química e Biológica, Instituto Politécnico de Bragança, Campus de Santa Apolónia, Apartado 1134, 5301-857 Bragança, Portugal

Nutraceuticals are compounds that provide a health benefit above and beyond basic nutrition. The integration of these products in the food industry involves the study of extraction, precipitation or crystallization processes in order to concentrate, separate and purify a specific compound or formulation. Therefore, a fast and efficient selection of food-approved solvents is required for a growing number of bioactive substances that are continuously being identified and tested. However, these compounds contain in their structure a variety of functional groups that makes them difficult to represent by usual thermodynamic models and procedures.

One goal of this work is to present new solubility data of hesperitin, quercetin and rutin in pure solvents like acetone, ethanol, ethyl acetate, n-hexane and water, in the temperature range between 25 and 60 °C by using the shake-flask method followed by quantitative analysis.

Additionally, another goal involves the combination of the measured data and that already compiled from the open literature, to develop a methodology to represent the solid-liquid equilibrium of nutraceuticals compounds using the the NRTL-SAC model, which has been successfully applied in the solubility description of high complex molecules like drugs.

The shake-flask method proved to be an adequate method to measure the solubility of nutraceuticals in pure and mixed solvents, in the temperature range between 25 and 60 °C. The NRTL-SAC model showed to be an appropriate tool to represent the solubility of these molecules, and suggests its ability to predict solubility in solvents not considered during the correlation procedure.