



ΙΔΡΥΜΑ ΤΕΧΝΟΛΟΓΙΑΣ ΚΑΙ ΕΡΕΥΝΑΣ

ΕΡΕΥΝΗΤΙΚΟ ΙΝΣΤΙΤΟΥΤΟ ΧΗΜΙΚΗΣ ΜΗΧΑΝΙΚΗΣ
ΚΑΙ ΧΗΜΙΚΩΝ ΔΙΕΡΓΑΣΙΩΝ ΥΨΗΛΗΣ ΘΕΡΜΟΚΡΑΣΙΑΣ

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ΣΕΜΙΝΑΡΙΟ

- ΟΜΙΛΗΤΗΣ:** Dr. Tomasz R. Sosnowski
Department of Chemical and Process Engineering
Warsaw University of Technology
- ΘΕΜΑ:** **DYNAMIC SURFACE TENSION: MEASUREMENT AND PRACTICAL IMPLICATIONS**
- ΤΟΠΟΣ:** Αίθουσα Σεμιναρίων ΕΙΧΗΜΥΘ-ΙΤΕ
- ΗΜΕΡΟΜΗΝΙΑ:** Τρίτη, 27 Μαΐου 2003
- ΩΡΑ:** 19:00

ΠΕΡΙΛΗΨΗ

Surface tension of surfactant solutions may vary with time due to changes in surface excess resulting from deformations of gas-liquid interface, surfactant adsorption and Marangoni effects. This presentation will discuss several methods of measurements of surface tension dynamics used at the Department of Chemical and Process Engineering, Warsaw University of Technology, to study interfacial phenomena, mainly in relation to physiological activity of the pulmonary surfactant. Theory of operation and results of chosen experiments will be given for the following devices: Langmuir-Wilhelmy film balance, oscillating bubble tensiometer, maximum bubble pressure tensiometer and the needle microtensiometer, all being used in our laboratory for investigations of dynamics of the air-liquid interface in the presence of surfactants. Interpretation of the results in respect to the function of the pulmonary surfactant, foam stability and other practical problems will be given.

Dr Tomasz R. Sosnowski (1968) has been since 1998 an Associate Professor at the Warsaw University of Technological University, Warsaw Poland. He has received his MSc degree (with honors) in Chemical Engineering in 1993, PhD (with honors) in Chemical Engineering in 1997, both from Warsaw University of Technology.

Main areas of research:

- Physics of dispersions (aerosols, bubbles, droplets, foams, and emulsions).
- Surface-active compounds in technological applications.
- Interfacial rheology.
- Physical chemistry and hydrodynamic effects of the pulmonary surfactant system.
- Optimization of drug generation for inhalation therapy.

Dr Sosnowski has contributed about 50 research papers and communications in the field, published in national and international journals e.g., Journal of Aerosol Medicine, Aerosol Science and Technology, Journal of Occupational Safety and Ergonomics, Journal of Aerosol Science; Chemical and Process Engineering (Poland).

He has been a postdoctoral fellow at Lovelace Respiratory Research Institute, Albuquerque, NM (USA), and a visiting scientist at Department of Working Environment, University of Lund (Sweden). He is a member of International Society for Aerosols in Medicine (since 1993).

He directed and cooperated in several grants founded by the State Committee for Scientific Research (KNCB) during 1993-2002.

Selected publications:

Sosnowski, T. R., 2003. Dynamic surface tension as an indicator of lung function in health and disease. *Biocybernetics Biomed. Eng.*, 23, 89-98.

Sosnowski, T.R., 2003. Rheological analysis of dynamic processes at a gas-liquid interface. I. Theory. *Inż. Chem. Procesowa* 23, 93-101 (*in Polish*).

Sosnowski, T.R., 2003. Rheological analysis of dynamic processes at a gas-liquid interface. II. Experiments. *Inż. Chem. Procesowa* 23, 103-112. (*in Polish*).

Sosnowski, T.R., 2001. Sorption-induced Marangoni microflows in the pulmonary surfactant system. *Inż. Chem. Procesowa* 22, 251-267.

Podgórski, A., Sosnowski, T.R., Gradoń, L., 2001. Deactivation of the pulmonary surfactant dynamics by toxic aerosols and gases. *J. Aerosol Med.*, 14, 455-466.

Gradoń, L., Sosnowski, T.R., 2001. Mass transfer through the gas-liquid interface at the presence of adsorbed active phospholipid monolayer. *Studies in Surface Science and Catalysis*, 133, 283-288.

Sosnowski, T.R., Gradoń, L., Podgórski, A., 2000. Influence of insoluble aerosol deposits on the surface activity of the pulmonary surfactant: a possible mechanism of alveolar clearance retardation? *Aerosol Sci. Techn.*, 32, 52-60.

Sosnowski, T.R., Podgórski, A., 1999. Assessment of the pulmonary toxicity of inhaled gases and particles with physicochemical methods. *Int. J. Occup. Safety Ergonomics*, 5, 433-449.

Sosnowski, T.R., Gradoń, L., Skoczek, M., Drożdżel, H. 1998. Experimental evaluation of importance of the pulmonary surfactant for oxygen transfer rate in human lungs. *Int. J. Occup. Safety Ergonomics*, 4, 391-409.