

# **ANNUAL REPORT 2007**



**Faculty of Chemical and Food Technology**  
Slovak University of Technology

Radlinského 9, 812 37 Bratislava

marec 2008

# INSTITUTE OF ANALYTICAL CHEMISTRY

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## DEPARTMENT OF ANALYTICAL CHEMISTRY

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## DEPARTMENT OF NMR SPECTROSCOPY AND MASS SPECTROMETRY

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## DEPARTMENT OF ANALYTICAL CHEMISTRY

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## I. STAFF

### Full Professors:

Dušan Bustín, PhD, DSc; Ján Krupčík, PhD, DSc; Ján Labuda, PhD, DSc; Jozef Lehotay, PhD, DSc;

Eva Matisová, PhD, DSc; Ján Mocák, PhD, DSc;

### Associate Professors:

Ernest Beinrohr, PhD; Eva Benická, PhD; Katarína Hroboňová, PhD; Miroslav Rievaj, PhD; Jana Sádecká, PhD;

Peter Tomčík, PhD; Viktor Vrábel, PhD;

### Assistant Professors :

Tatiana Buzinkaiová, PhD (till 30.6.2007); Andrea Hercegová, PhD; Pavol Májek, PhD; Alena Manová, PhD;

Pavol Tarapčík, PhD;

### Research Fellows:

Adriana Ferancová, PhD; Svetlana Hrouzková, PhD; Damián Meričko (since 15.5.2007); Janka Mydlová, PhD;

Tatiana Rojkovičová, PhD (till 15.4.2007); Ivan Skačáni, PhD; Ivan Špánik, PhD; Mária Vaničková, PhD

(15.3.2007-30.6.2007);

### PhD Students:

František Čacho; Júlia Galandová; Stanislava Hlúbiková; Renáta Húšková; Antónia Janáčková; Dáša Kružlicová; Miroslava Lachová; Damián Meričko (till 14.5.2007); Renáta Ovádeková (till 30.9.2007); Katarína Repaská (since 1.10.2007); Darina Šimková; Ľubomír Švorc; Jana Tóthová (since 1.10.2007);

### Technical staff:

Marta Benešová; Anna Chalupková; Ľubica Zajacová

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of capillary gas chromatography and MS

Laboratory of high performance liquid chromatography

Laboratory of capillary isotachopheresis

Laboratory of electroanalytical methods

Laboratory of molecular spectrometry

Laboratory of electrochemical pre-concentration for atomic spectroscopy

Laboratory of bioanalytical chemistry

### B. Research laboratories:

Laboratory of organic synthesis

Laboratory of capillary gas chromatography

Laboratory of high performance liquid chromatography

Laboratory of capillary isotachopheresis

Laboratory of electroanalytical methods

Laboratory of molecular spectrometry

Laboratory of atomic spectroscopy

Laboratory of bioanalytical chemistry

## III. TEACHING

### A. Undergraduate Study:

3 semester (Bc)	Analytical Chemistry I (1100, 1200)	2/0/0/0	Benická
	Laboratory of Analytical Chemistry I (1100, 1200)	0/0/0/4	Benická
	Analytical Chemistry I (1600, 1720)	1/0/0/0	Labuda

	Laboratory of Analytical Chemistry I (1600, 1720)	0/0/0/2	Labuda
	Analytical Chemistry I (1710)	2/1/0/0	Benická
	Laboratory of Analytical Chemistry I (1710)	0/0/0/4	Benická
4 semester (Bc)	Analytical Chemistry II (1100, 1200)	2/0/0/0	Benická
	Laboratory of Analytical Chemistry II (1100, 1200)	0/0/0/4	Benická
	Analytical Chemistry (1400)	2/1/0/0	Vrábel
	Laboratory of Analytical Chemistry (1400)	0/0/0/5	Vrábel
	Analytical Chemistry II (1600, 1720)	2/0/0/0	Labuda
	Laboratory of Analytical Chemistry II (1600, 1720)	0/0/0/3	Labuda
	Analytical Chemistry II (1710)	2/1/0/0	Benická
	Laboratory of Analytical Chemistry II (1710)	0/0/0/5	Benická
	Testing and Quality Control	2/0/0/0	Špánek
	Analytical Chemistry (1900)	2/1/0/0	Vrábel
	Laboratory of Analytical Chemistry (1900)	0/0/0/2	Vrábel
	Analytical Chemistry I (terminating)	2/2/0/0	Vrábel
	Laboratory of Analytical Chemistry I (terminating)	0/0/0/4	Vrábel
5 semester (Bc)	Analytical Chemistry II (terminating)	2/2/0/0	Lehotay
	Laboratory of Analytical Chemistry II (terminating)	0/0/0/4	Rievaj
	Testing and Quality Control	1/1/0/0	Špánek
	Computer Evaluation of Analytical and Technological Data	2/0/0/0	Májek
6 semester (Bc)	Semester Project	0/0/0/4	Sádecká
1 semester (MSc)	Laboratory of Specialisation I.	0/0/0/10	Sádecká
	Analytical Spectrometry	2/0/0/0	Beinrohr
	Analytical Chemistry of Complex Inorganic Mixtures	2/0/0/0	Hercegová
	Analytical Chemistry of Complex Organic and Biol. Mixtures	2/0/0/0	Sádecká
	Biosensors (0710)	2/0/1/0	Labuda
	Computer Processing of Analytical Data	2/0/0/0	Májek, Mocák
2 semester (MSc)	Techniques of Mixture Separations	2/0/2/0	Matisová
	Electrochemistry and Electroanalytical Chemistry	2/0/1/0	Bustín
	Laboratory of Specialization II.	0/0/0/6	Sádecká
	Analytical Separation Methods	2/0/1/0	Krupčík, Matisová
	Practice	0/0/0/0	Sádecká
	Automation of Analytical Chemistry	2/0/0/0	Rievaj
	Trace Analysis and Microanalysis	2/0/0/0	Beinrohr
3 semester (MSc)	Laboratory of Specialization II.	0/0/0/10	Sádecká
	Nuclear Analytical Chemistry	2/0/0/0	Tarapčík
	Automation of Analytical Chemistry	2/0/0/0	Rievaj
	Bioanalytical Chemistry	2/0/1/0	Labuda, Mocák
	Environmental Analytical Chemistry	2/0/0/0	Benická
	Identification of Chemical Substances	2/0/1/0	Lehotay, Liptaj
	Trace Analysis and Microanalysis	2/0/0/0	Beinrohr
	Separation Methods (0610, 0620, 0630, 0640)	2/0/0/0	Matisová
	Laboratory of Separation Methods (0610, 0620, 0630, 0640)	0/0/0/2	Matisová
	Identification Methods (0610, 0620, 0630, 0640)	2/0/0/0	Lehotay
	Laboratory of Identification Methods (0610, 0620, 0630, 0640)	0/0/0/2	Lehotay
	Monitoring of Environment (0800)	2/0/0/0	Benická
4 semester (MSc)	Laboratory of Diploma Work	0/0/0/27	Sádecká

## IV. CURRENT RESEARCH PROJECTS

### **A. VEGA Project No 1/2460/05 Thermodynamic Study of Enantiomer Separations by HPLC, Correlation Studies Using Artificial Neural Networks, Development of Novel Analytical Methods for Determination of Biological Relevant Compounds (Jozef Lehotay).**

The set of chromatographic data – enantioselectivities, retention factors of many organic compounds was used as a training set and the final artificial neural networks was used for prediction and optimization of enantioselective separations. Kinetic and thermodynamic aspects of molecular chiral recognition, enthalpic and entropic evaluation of chiral separation were studied.

Project duration: from 01.01.2005 to 31.12.2007

### **B. VEGA Project No 1/2464/05 Development, Metrological and Chemometric Evaluation of Electrochemical and Spectrometric Techniques of Trace Analysis with Special Emphasis to Clinical, Food and Environmental Problems (Dušan Bustin).**

Research study of new instrumental techniques and sensors for electroanalytical chemistry and spectrometry is concerned in the solution of practical problems of trace analysis including speciation of the analytical sample components, which exhibit e.g. a different toxicity, biological activity or oxidation-reduction properties. Chemometric characterisation, classification and assesment of clinical, biological, food and environmental samples is performed by using modern techniques of multivariate data analysis, artificial neural networks and similar algorithms. Attention is paid to elaboration and optimisation of electrochemical enrichment procedures for selected group of metals for atomic spectrometry, chemical speciation study for arsenic and selenium, investigation of coulometric titrations in thin layer systems for simple and rapid determination of electroactive species such as metals, some organic and inorganic substances.

Project duration: from 01.01.2005 to 31.12.2007

### **C. VEGA Project No 1/2461/05 Development of New Methods for Fast Chromatographic Analysis of Isomers and Enantiomers of Volatile Organic Compounds in Multicolumn and Multidimensional Coupled Systems Hyphenated to Mass Spectrometry (Ján Krupčík).**

The project aims to the (i) development of the concise, systematic and optimized methods of evaluation of data of complex samples containing volatile compounds of similar properties, including chiral compounds, achieved by fast chromatographic techniques with universal or selective detection, including MS, via single- and more-dimensional separations; (ii) development of advanced prediction methods for determination of hyphenated systems properties and determination of chromatographic properties of enantiomers.

Project duration: from 01.01.2005 to 31.12.2007

### **D. VEGA Project No 1/2463/05: Fast GC for (Ultra)Trace Analysis of Organic Compounds in Complex Samples (Eva Matisová).**

Project searches possibilities and limitations of fast capillary gas chromatography and its combination with mass spectrometry for (ultra)trace analysis of volatile and semivolatile organic compounds in multicomponent model and predominantly real environmental samples with the aim of fast separation, increase of resolution and sensitivity. A part of the project is devoted to the evaluation of factors influencing discrimination/degradation of analytes, broadening of chromatographic zone, focusation, peaks shape, quality of analytical signal, and their optimisation under the conditions of ultratrace analysis. A part of the project is directed to increasing sensitivity of fast GC, GC-MS in combination with effective isolation and preconcentration techniques and investigation of the influence of matrix effects on robustness and quality of analytical results.

Project duration: from 01.01.2005 to 31.12.2007

### **E. VEGA Project 1/2462/05: Chemical Toxicity Sensors – Investigation of Selected Environmental Chemical Risk Factors Using Biosensors Based on DNA and Lipids (Ján Labuda).**

Detection of chemical association interactions and damage to deoxyribonucleic acid (DNA) and lipids serve for rapid and inexpensive screening of the chemicals toxicity. Within the project, chemical interactions of environmental carcinogens such as arsenic and tin compounds as well as selected aromatic and heterocyclic compounds, in particular their nitro-derivatives, with DNA and lipids immobilized on the surface of electrochemical

signal transducers are investigated. Application of the electrochemical biosensors allows also in vitro generation and testing of potential metabolites and an investigation of mechanisms of risk species effects. This leads to the methodical development of new screening tools based on biosensors and bioelectronic chips. Possibilities of the biopolymers protection against a structural damage by environmental carcinogens using natural and synthetic antioxidants are studied too.

Project duration: from 01.01.2005 to 31.12.2007

#### **F. APVV Project 20-015904: New Biomaterials and Biosensors for Clinical Use (Ján Labuda).**

Preparation of new biomaterials based on biopolymers and bioinorganic materials for clinical application as well as biosensors based on deoxyribonucleic acid (DNA) and lipoproteins (LDL) for direct use in clinical medicine.

Project duration: from 01.01.2005 to 31.12.2007

#### **G. APVT Project 27-010304: Development of Sensitive Indicator-free Method for the Detection of DNA Damage Caused by Lipid Oxidation Products Using DNA/SPE Biosensor (Adriana Ferancová).**

The project aims at the study and evaluation of the activity of selected oxidation products of lipids on the DNA using new detection system based on carbon nanotubes modified DNA biosensor. Specific primary (hydroperoxides) and secondary lipid oxidation products can play an important role in the damage to DNA resulting in faster ageing process, neurodegenerative, carcinogenic or cardiovascular diseases.

Project duration: from 15.06.2007 to 15.11.2007

#### **H. APVT Project 20-002904: Identification of Suitable Authentication Markers and Development of Optimal Analytical Methods for their Determination in Selected Food Commodities (Ivan Špánik).**

The major objective of project is identification of potential authentication markers and development of suitable analytical methods and sample treatment procedures for their determination. The first part of project covers determination of qualitative and quantitative data about selected authentication markers (including enantiomeric composition of optically active compounds) in selected food commodities, mainly for those that are most frequently distributed in Slovakian market (juices, ketchup and honey). Obtained data will be summarized in authentication markers database, which will be tested on unknown samples of food commodities commonly distributed on Slovakian market. The second part of project is aimed on detailed mapping of chemical composition of food commodities that are included in Slovak Republic claim on Protected Denomination of Origin, Protected Geographical Indication or Traditional Speciality Guaranteed (mainly beverages) by available single-, multidimensional and hyphenated chromatographic systems.

Project duration: from 01.01.2005 to 31.12.2007

#### **CH. VEGA Project NATO Project No 2/7074/07: Evaluation of Activity Parameters of Potential Inhibitors of Aldose Reductase - a Contribution to Therapy of Chronic Diabetic Complications (Pavel Májek).**

Inhibitors of the aldose reductase enzyme (ALR2) are drugs capable to prevent a tissue injury caused by diabetes, prevalently by type II, which is insulin-resistant and it is being spread epidemiologically. 3D structure of the ALR2 enzyme was already estimated from various biological sources and in complexes with different adducts. In this project we wish utilize connectivity with existing international and Slovak projects solved at IEPH SAS which are targeted to the projection of new ALR2 inhibitors missing in clinical praxis. We will use the experimental results on the inhibition activity for the pyridoindole-like (PyInd) substances which have been already synthesized and tested at Institute. First off, we will determine the best theoretical way of estimation of activity by means of the methods of computational chemistry. Then we will create a database of potential PyInd ALR2 inhibitors which shall fulfill the foregoing theoretical criteria as well as other conditions made for pharmacologically active substances. The most attractive derivatives will be proposed for synthesis and use in the connecting projects.

Project duration: from 01.01.2007 to 31.12.2009

### **I. APVV Project -20-035205: Development of New HPLC and GC Methods with Specific Selectivity on Isomer Analysis of Some Biologically Active Compounds (Jozef Lehotay).**

The main topics of the project are: the development of new chromatographic methods with specific selectivity for the separation of isomers and enantiomers of biologically active compounds with use of ionic liquids (in HRGC, and LC) and enantioselective stationary phases of new types (HPLC and HRGC); study of structure-chromatographic behavior relationships of biologically important compounds in this new types of chromatographic systems (and phases); theoretical studies of prediction methods for selected compounds behavior utilizing advanced methods of modeling; study of separation mechanism and determination of important interactions for new types of phases, kinetic studies; the development of coupled separation techniques containing the parts with new type selectivity, and techniques of selective liquid-phase predseparation of samples with complex biological matrix.

Project duration: from 01.05.2006 to 30.04.2009

### **J. APVV Project-0057-06: New Electroanalytical Techniques and Procedures of Improvement of Atomic Spectroscopy-Determination and Chemometrical Characterization of Analytes (Peter Tomčík).**

The basic research project is aimed to development and chemometric characterisation of electroanalytical techniques for the determination of species with detection limits mostly in trace or ultratrace level. Attention will be paid to voltammetric and chronopotentiometric determinations of heavy metals in samples containing high amount of sodium at presence of which application of optical method is mitigated. Further aims of the project are pointed to research on microelectronic structures ( interdigitated microelectrode arrays) which are very perspective products of thin layer technology. For analytical chemistry they represent detectors for fast, sensitive and selective detection of species including those where deposition onto electrode surface is not possible.

Project duration: from 01.02.2007 to 31.12.2009

### **K. APVV Project-20-000705: Fast Gas Chromatography – Mass Spectrometry for Environmental and Food Analysis of Selected Groups of Organic Pollutants (Eva Matisová).**

Project is devoted to development of fast and sensitive analytical methods for toxic compounds monitoring, particularly on ultra-trace concentration level. This follows the recent scientific requirements for the better understanding of pollutants effects, the increase of reliability of analytical results, what stimulates the establishment of legal directives to better control of pollution to protect the health of inhabitants. The aim is not to use the highly sophisticated and costly instrumentation but relatively robust techniques. The promising solution to reach the low LOQs, particularly in complicated matrices is the combination of converting a sample into a suitable form for measurement (utilising the fast and effective preparation methods) and subsequent analysis under the optimized fast GC-MS conditions. The parameters and robustness of the developed methods will be evaluated using chemometric approaches.

Project duration: from 01.05.2006 to 30.04.2009

### **L. Applied Research Project, Ministry of Education of SR: Use of Biosensors, Biomaterials and Biosignals in Medicine (Ján Labuda).**

Integrated project of the Centre of biomedical engineering of the STU in Bratislava. Construction and standardization of electrochemical biosensor based on DNA. Preparation of hydrogel systems with programmable diffusion properties for biomedical applications including drug delivery. Evaluation of biosignals of patients by using ICT.

Project duration: from 01/2006 to 12/2009

## **V. CURRENT EDUCATION PROJECTS**

### **A. European Social Fund Project, Ministry of Education of SR No 13120200086: MediTech - Innovation Program of Modern Biomedical Technologies (Ján Labuda).**

Aim of the project is a development of human sources within biomedical engineering in the region of Bratislava. The project covers activities of the Centre of biomedical engineering of the STU in Bratislava and it is devoted to students, young research workers and research workers.

Project duration: from 07/2006 to 02/2008

**B. Grant KEGA No 3/5207/07: e-Book 'Analytical Methods in Clinical Chemistry' (Jana Sádecká).**

The project deals with the creation of the e-book 'Analytical Methods in Clinical Chemistry' as the digital media equivalent of a conventional printed book. The product will enable to create a printed book and to search text automatically and to cross-references using hyperlinks.

Project duration: from 01.01.2007 to 31.12.2008

**C. CEEPUS Project No PL-0130-07/08: Education in Separation Methods for Organic Environmental Analysis in XXI. Century (Ján Krupčík).**

The main objective of this project is to improve the quality of MSc and PhD education in Analytical Chemistry at the cooperating universities, with the emphasis on modern analytical separation methods. This will be accomplished by exchange both of graduated and PhD students as well as teachers between the University of Technology Graz, University of Pardubice, Nicolaus Copernicus University in Toruń, University of Łódź, University of Veszprém, Medical Academy in Gdańsk and the Slovak University of Technology in Bratislava. Special attention will be paid on the application of hyphenated techniques and on the fitting of the educational process to the needs and settings of the European Community.

Project duration: from 01.01.2007 to 30.09.2008

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Faculty of Informatics and Information Technologies, Bratislava	Interdigitated array of microelectrodes	Řeháček V., research fellows, Ilkovičova 3, 841 04 Bratislava	01.01.1994-
TU, Trenčín	Development of new measuring methods	Liška M., prof. Ing. DrSc., TU Trenčín	01.07.2006-31.12.2007
National Reference Laboratory, Bratislava	Pesticides residues	Krascsenits Z., Ing., Nábr. L. Svobodu 5, 812 49 Bratislava	01.01.2006-
Food Research Institute, Bratislava	Characterization of slovakian brandies by GC-O, Development of sensors and evaluation of natural antioxidants	Sádecká J., Ing., Kolek E., Ing., Šilhár S., Assoc. Prof., Priemyselná 4, Bratislava	01.01.2007-
Pharmaceutical Faculty, Comenius University, Bratislava	Chiral separation of some anaesthetics using HPLC method	Čižmárik J., professor, Odbojárov 10, 832 32 Bratislava	01.01.1988-
Faculty of Electrical Engineering and Information Technology, Bratislava	Joint research and education projects	Lehotski F., Dr., Tvarožek V., professor, Ilkovičova 3, 84104 Bratislava	01.01.2007-
ISTRAN, s.r.o., Bratislava	End-user of the project	Beinrohová M., Ing., director of company, Víglašská 12, 851 06 Bratislava	01.01.2007-
Novácke chemické závody, a.s., Nováky	Professionals seminar on statistics in evaluation of analyses, gas chromatography, trends in analytical separation	Karkuš M., JUDr. Ing., M. R. Štefánika 1, 972 71 Nováky	16.5.2007



## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Oxford University, Oxford, United Kingdom	Common papers	Compton Richard G., professor, Department of Chemistry, Oxford University, Oxford, United Kingdom	09.09.2002-
Depart. Anal. Chemistry, Faculty of Natural Sciences, Charles University, Praha, Czech Republic	Study stay of students	Barek Jiří, professor, UNESCO Laboratory of Environmental Electrochemistry, FNS Charles University, 128 43 Praha	01.01.2002-
Faculty of Sciences, Aristotle University, Thessaloniky, Greece	Erasmus project	Girousi Stella, Assist. Prof., Faculty of Sciences, Aristotle University, Thessaloniky, Greece	01.09.2007-
University Osijek, Croatia	Joint research	Šeruga M., professor, University Osijek, Croatia	01.10.2006-
Faculty of Science, Masaryque University, Brno, Czech Republic	Methods for sensor validation	Trnková Libuše, Assoc. Prof. RNDr. PhD., Department of Theoretical and Physical Chemistry, Kotlářská 2, 611 37 Brno, Czech Republic	01.01.2006-
Plant Protection Institute, Kostinbrod, Bulgaria	Cooperation in pesticide residues analysis	Balinova Anna, Assoc. Prof., DSc., Mladenova Rositsa, PhD., Toxicology Department, PPI, 2230 Kostinbrod, Bulgaria	01.01.2004-
Department of Chemistry and Biochemistry, University of Texas, Arlington TX, USA	Chiral separation of optical active compounds by HPLC and HRGC	Armstrong Daniel Wain, professor, Department of Chemistry and Biochemistry, University of Texas, Arlington TX, 76019 USA	01.01.1997-
Department of Organic Chemistry, University of Gent, Gent, Belgium	Comprehensive GCxGC	Sandra Pat, professor, Gent University, Department of Organic Chemistry 9000 Gent, Belgium	01.01.1996-
Nicholas Copernicus University, Toruń, Poland	Trace analysis in GC and HPLC development of new chemical bounded phases	Buszewski Boguslaw, professor, NCU, Faculty of Chemistry, Gagarin Street 7, 87-100 Toruń, Poland	01.01.1995-
Department of Building Materials, AGH-University of Mining and Metallurgy, Cracow, Poland	Electroanalytical chemistry and chemometrics	Bobrowski Andrzej, professor, Al. Mickiewicza, PL-30-059 Cracow, Poland	01.09.2001 -
Institute of Analytical Chemistry and Radiochemistry, Technical University, Graz, Austria	Chemometrical classification of food and biologically important samples	Lankmayr Ernst, professor, vice-head of Institute, Techniker str. 4, A-8010 Graz, Austria	01.03.2002 -
Department of Chemistry, Faculty of Chemistry and Chemical Engineering, University of Maribor, Maribor, Slovenia	Food analysis and environmental chemistry	Brodnjak-Vončina Darinka, professor, Smetanova 17, 2000 Maribor, Slovenia	01.01.2004-
Department of Analytical Chemistry, University of Pardubice, Pardubice, Czech Republic	Joint project	Jandera Pavel, professor, Čsl. légií 565, 532 10 Pardubice, Czech Republic	01.01.2004-

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Beinrohr Ernest	Slovak Spectroscopic Society	member	01.01.2003-
Bustin Dušan	Slovak Chemical Society	member	01.01.1971-
Galandová Júlia	Slovak Chemical Society	member	01.01.2007-
Hroboňová Katarína	Slovak Chemical Society	member	01.01.1996-
Krupčík Ján	Slovak Chemical Society	member	01.01.1977-
Labuda Ján	Slovak Chemical Society	member	01.01.1998-
Labuda Ján	Academy Senate of FCHPT	member	01.03.2002-
Labuda Ján	Analytical Chemistry Group of SCHS	chairmann	01.01.2005-
Labuda Ján	Editorial Board of the Journal Chemical Papers	member	01.02.2006-
Lehotay Jozef	Slovak Chemical Society	member	01.01.1971-
Lehotay Jozef	Union of Slovak Scientific Societies, Analytical Chemistry Group	chairmann	04.03.2001-
Lehotay Jozef	The Ministry of Education SR, Scientific Agency (VEGA)	chairmann	30.04.2002-
Lehotay Jozef	Commission for Air/Pollution (TNK 28)	member	01.01.1999-
Lehotay Jozef	Commission for Waste Management (TNK 31)	member	01.01.1999-
Lehotay Jozef	Scientific Council of FCHPT	member	01.02.2003-
Lehotay Jozef	Agency for Support of Science and Technique Ministry of Education	member of advisory board	10.09.2003-
Manová Alena	Slovak Spectroscopic Society	member	01.01.2003-
Matisová Eva	Slovak Chemical Society	member	01.01.1978-
Matisová Eva	EU Centre of Excellence in Environmental Health Research Institute of Preventive and Clinical Medicine, Bratislava	member of advisory board	01.01.2003-
Mocák Ján	Slovak Medical Society, Bratislava	honorary member	01.10.1998-
Mocák Ján	Scientific Journal "Laboratorna diagnostika" (Laboratory Diagnostics), Bratislava	scientific editor	01.09.1996-

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Beinrohr Ernest	Gessellschaft Deutcher Chemiker, Frankfurt, Germany	member	01.06.1990-
Bustin Dušan	IUPAC Fellowship, Switzerland	member	07.03.2002-
Labuda Ján	Division of Analytical Chemistry of the European Association for Chemical and Molecular Sciences, EuCheMS	delegate of SCHS	06.09.1999-
Labuda Ján	Analytical Chemistry Division of International Union of Pure and Applied Chemistry, IUPAC	titular member	01.01.2006-
Lehotay Jozef	European Commission Science, Research and Developments, Brussel, Belgium	expert	23.02.1999-
Lehotay Jozef	Chemical Analysis, Editorial Board of the Journal, Warszawa, Poland	member	07.11.2001-

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Ziyatdinova, G.	Kazan State University, Kazan	Russia	March-May 2007 (90 days)
Barek, J.	Charles University, Praha	Czech Republic	March 2007 (4 days)
Trafela, T.	University of Ljubjana, Ljubjana	Slovenia	April-May 2007 (25 days)
Gadzala-Kopciuch, R.	Nicolaus Copernicus University, Toruń	Poland	June 2007 (6 days)

Zapadlo, M.	Palacky University, Olomouc	Czech Republic	May-August 2007 (3 months)
Reczuch, A.	Nicolaus Copernicus University, Toruń	Poland	September 2007 (4 days)
Korhoňová, M.	Palacky University, Olomouc	Czech Republic	September- December 2007 (3 months)
Nemet, I.	University of Osijek, Osijek	Croatia	May-June 2007 (1 month)
Buszewski, B.	Nicolaus Copernicus University, Toruń	Poland	June 2007 (5 days)
Jandera, P.	University of Pardubice, Pardubice	Czech Republic	June 2007 (5 days)
Armstrong, D.W.	University of Texas at Arlington, Arlington, Texas	USA	June 2007 (5 days)
Novotny, M.V.	Indiana University, Bloomington, Indiana	USA	June 2007 (5 days)
Welsch, T.	Ulm University, Ulm	Germany	June 2007 (5 days)
Šegudovič, N.	INA-Oil Industry, Zagreb	Croatia	June 2007 (5 days)
Fanali, S.	Institute of Chemical Methodologies, Rím-Monterotondo Scalo	Italy	June 2007 (5 days)
Klebovich, I.	Semmelweis University, Budapest	Hungary	June 2007 (5 days)
Kenndler, E.	University of Vienna, Vienna	Austria	June 2007 (5 days)
Barek, J.	Charles University, Praha	Czech Republic	November 2007 (3 days)
Součková, J.	Palacky University, Olomouc	Czech Republic	November- December 2007 (2 months)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Beinrohr, E.	Seminar 2 THETA, Komorní Lhotka	Czech Republic	March 2007 (1 day)
Beinrohr, E.	Mining Technical University, Ostrava	Czech Republic	June 2007 (1 day)
Beinrohr, E.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Beinrohr, E.	University of Brescia, Brescia	Italy	November 2007 (3 days)
Benická, E.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Benická, E.	Seminar Analysis of Organic Compounds, Pohořelice	Czech Republic	October 2007 (3 days)
Čacho, F.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Čacho, F.	Seminar Inorganic Environmental Analysis, Komorní Lhotka	Czech Republic	November 2007 (3 days)
Čacho, F.	Masaryque University, Brno	Czech Republic	November- December 2007 (46 days)
Ferancová, A.	Conference Modern Electroanalytical Methods, Jetřichovice	Czech Republic	May 2007 (4 days)
Ferancová, A.	9th Polish Supramolecular Chemistry Network Conference, Koninki	Poland	October 2007 (4 days)
Galandová, J.	Masaryque University, Brno	Czech Republic	January 2007 (2 days)

Galandová, J.	Faculty of Natural Sciences, Charles University, Praha	Czech Republic	May-June 2007 (19 days)
Galandová, J.	Institute of Biophysics Academy of Sciences, Brno	Czech Republic	June 2007 (1 day)
Galandová, J.	University of Patras, Patras, Aristotle University of Thessaloniki, Thessaloniki	Greece	September- October 2007 (27 days)
Galandová, J.	Masaryque University, Brno	Czech Republic	December 2007 (1 day)
Hercegová, A.	44th Florida Pesticide Residue Workshop, St Pete Beach, Florida	USA	July 2007 (6 days)
Hlúbíková, S.	Seminar Inorganic Environmental Analysis, Komorní Lhotka	Czech Republic	November 2007 (3 days)
Hroboňová, K.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Húšková, R.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Húšková, R.	Seminar Analysis of Organic Compounds, Pohořelice	Czech Republic	October 2007 (4 days)
Janáčková, A.	30th International Symposium on Capillary Chromatography, Dalian	China	June 2007 (12 days)
Janáčková, A.	International Symposium CHIRANAL 2007, Palacky University, Olomouc	Czech Republic	June 2007 (3 days)
Krupčík, J.	30th International Symposium on Capillary Chromatography, Dalian	China	May-June 2007 (12 days)
Krupčík, J.	19th International Symposium CHIRALITY 2007, San Diego, Dallas	USA	July 2007 (11 days)
Krupčík, J.	International Symposium CHIRANAL 2007, Palacky University, Olomouc	Czech Republic	June 2007 (5 days)
Krupčík, J.	Research Institute for Chromatography, Kortrijk	Belgium	September 2007 (3 days)
Krupčík, J.	Ministry of Health REFIK SAYDAM CENTRAL, Hygiene Institute-Poison Research Department, Ankara	Turkey	September- October 2007 (6 days)
Krupčík, J.	REFIK-HYGIENE INSTITUTE, Ankara	Turkey	November 2007 (6 days)
Kružlicová, D.	Conference YISAC '07, Universita of Pardubice, Pardubice	Czech Republic	June 2007 (4 days)
Kružlicová, D.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Labuda, J.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Labuda, J.	Charles University, Praha	Czech Republic	June 2007 (6 days)
Labuda, J.	44th IUPAC General Assembly and the World Chemistry Congress, Torino	Italy	August 2007 (4 days)
Labuda, J.	Institute of Biophysics Academy of Sciences, Brno	Czech Republic	June 2007 (1 day)
Labuda, J.	University of Patras, Patras	Greece	September- October 2007 (6 days)
Labuda, J.	Institute of Biophysics Academy of Sciences, Brno	Czech Republic	August 2007 (1 day)
Labuda, J.	International Workshop Surface Modification for Chemical and Biochemical Sensors, Wladowice	Poland	November 2007 (7 days)
Lachová, M.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Lachová, M.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Lehotay, J.	30th International Symposium on Capillary Chromatography, Dalian	China	May-June 2007 (12 days)
Lehotay, J.	19th International Symposium CHIRALITY 2007, San Diego, Dallas	USA	July 2007 (11 days)
Lehotay, J.	Charles University, Praha	Czech Republic	March 2007 (1 day)

Lehotay, J.	Pharmaceutical Faculty of Charles University, Hradec Králové	Czech Republic	March 2007 (6 days)
Lehotay, J.	University of Pardubice, Pardubice	Czech Republic	April 2007 (1 day)
Lehotay, J.	Faculty of Chemistry and Technology, University of Pardubice, Pardubice	Czech Republic	May 2007 (3 days)
Lehotay, J.	International Symposium CHIRANAL 2007, Palacky University, Olomouc	Czech Republic	June 2007 (5 days)
Lehotay, J.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Lehotay, J.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Lehotay, J.	Seminar Analysis of Organic Compounds, Pohořelice	Czech Republic	October 2007 (3 days)
Lehotay, J.	Nicolaus Copernicus University, Toruń	Poland	October 2007 (4 days)
Lehotay, J.	Pharmaceutical Faculty of Charles University, Hradec Králové	Czech Republic	October 2007 (5 days)
Manová, A.	International Conference on Toxicology, Praha	Czech Republic	June 2007 (6 days)
Manová, A.	13th Spectroscopic Conference, Lednice na Morave	Czech Republic	June 2007 (4 days)
Manová, A.	Conference Colloquium Spectroscopicum Internationale XXXV, Xiamen	China	September-October 2007 (10 days)
Matisová, E.	5th MGPR International Symposium on Pesticides in Food and the Environment, Agadir	Morocco	November 2007 (8 days)
Meričko, D.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Meričko, D.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Mocák, J.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Mocák, J.	Conference YISAC '07, Universita of Pardubice, Pardubice	Czech Republic	June 2007 (4 days)
Mydlová, J.	Research Institute for Chromatography, Kortrijk	Belgium	September-October 2007 (1month)
Ovádeková, R.	Masaryque University, Brno	Czech Republic	January 2007 (2 days)
Sádecká, J.	Conference Advances in Chromatography and Electrophoresis 2007, Palacky University, Olomouc	Czech Republic	June 2007 (3 days)
Špáňík, I.	LECO Instrumente, Praha	Czech Republic	February 2007 (1 day)
Špáňík, I.	30th International Symposium on Capillary Chromatography, Dalian	China	June 2007 (12 days)
Špáňík, I.	3rd International Workshop on Alcoholic Beverages Authentication IWABA 2007, Stressa	Italy	November 2007 (5 days)
Špáňík, I.	LECO Instrumente, Praha	Czech Republic	October 2007 (2 days)
Špáňík, I.	Department of Organic Chemistry, Tuebingen University, Tuebingen	Germany	November 2007 (3 days)
Špáňík, I.	Workshop TACIS, Charkov	Ukraine	November-December 2007 (7 days)
Tomčík, P.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Tóthová, J.	Institute of Chemical Technology, Praha	Czech Republic	February 2007 (3 days)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Buková, N.	Determination of Selected Metals Cu and Pb in Organic Matrices by Atomic Absorption Spectrometry.	Manová, A.
Kovačič, M.	Practical Application of Fast Gas Chromatography Methods.	Benická, E.
Kubaská, M.	Synchronous Fluorescence Spectrometry in Green Tea Analysis.	Šádecká, J.
Kurczová, D.	Determination of Trace Contaminants in Water by Flow-Through Coulometry and Chronopotentiometry.	Beinrohr, E.
Příš, L.	Application of Synchronous Fluorescence Spectrometry in Multi-Component Analysis.	Šádecká, J.
Senešiová, L.	Analysis of Organic Compounds by Gas Chromatography with Advanced Method Processing.	Benická, E.
Žiak, L.	Fluorescence Spectrometry in Food Classification.	Šádecká, J.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Đurovec, I.	The Optimisation of Data Collection and Processing for Gas Chromatography.	Benická, E.
Fraňo, L.	Chemometrical Analysis of Clinical and Electrochemical Data.	Mocák, J.
Jánošíková, Z.	Methods and Procedures of Electroanalysis on Interdigitated and Carbon Structures.	Tomčík, P.
Matušková, J.	Determination of Trace Elements in Pure Phosphorus with AAS and Flow-Through Coulometry.	Beinrohr, E.
Repaská, K.	GC Separation Enantiomers of Organic Compounds in Single and Dual Capillary Column.	Špánik, I.
Takáčsová, G.	Selective Analysis of Volatile Compounds by Gas Chromatography.	Benická, E.
Tóthová, J.	Application of Fluorescence Spectrometry in Food Classification.	Šádecká, J.
Tropp, M.	Electrochemical Preconcentration of Sb for Determination by GF AAS.	Manová, A.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Fedurcová, A.	Separation of Chiral Compounds by HPLC.	Lehotay, J.
Mydlová, J.	The Use of Deconvolution Methods for the Separation of Chromatographically Unresolved Peaks.	Krupčík, J.
Ovádeková, R.	Development of Biosensors for Evaluation of Biomedical Materials, Food Additives and Environmental Risk Chemicals.	Labuda, J.

## VIII. PUBLICATIONS

### Chapters or pages in books

- [1] Čácho, F., Střelec, M., Beinrohr, E., Manová, A.: Determination of Semimetals by on-line Electrochemical Preconcentration/GFAAS : 27<sup>th</sup> International Symposium, Bratislava. In: Industrial Toxicology 07, 27<sup>th</sup> International Symposium Proceedings, May 30 - June 1, 2007, Bratislava, Slovak Republic : 27<sup>th</sup> International Symposium Proceedings, May 30 - June 1, 2007, Bratislava, Slovak Republic. - Bratislava : Slovak University of Technology Bratislava, 2007, p. 150-156. ISBN 978-80-227-2654-2.
- [2] Ferancová, A., Labuda, J.: Use of nanomaterials at chemical sensors. In: Senzory, p. 203-218. ISBN 978-80-86238-20-3.
- [3] Manová, A., Tropp, M., Čácho, F., Beinrohr, E.: Determination of Antimony by on-line Electrochemical Preconcentration/GFAAS : 27<sup>th</sup> International Symposium, Bratislava. In: Industrial Toxicology 07, 27<sup>th</sup> International Symposium Proceedings, May 30 - June 1, 2007,

Bratislava, Slovak Republic : 27th International Symposium Proceedings, May 30 - June 1, 2007, Bratislava, Slovak Republic: Slovak University of Technology Bratislava, 2007, p. 60-65. ISBN 978-80-227-2654-2.

- [4] Manová, A., Beinrohr, E.: Elektrochemické generovanie arzánu pre AAS : Analytické metódy v environmentálnom inžinierstve. In: IX. Banskoštiavnické dni 2007 : Zborník prednášok. Banská Štiavnica 3.-5.10.2007. - Zvolen : Technická univerzita vo Zvolene, 2007, p. 145 - 148. ISBN 978-80-228-1786-8
- [5] Manová, A., Beinrohr, E., Hlúbiková, S.: Využitie biosenzorov v potravinárstve : XVI medzinárodná konferencia o analytických metódach v potravinárstve, Banská Bystrica. In: Zborník prednáškových a posterových príspevkov zo XVI. Medzinárodnej konferencie LABORALIM 2007 o analytických metódach v potravinárstve, vsúlade s legislatívou EÚ. B. Bystrica, 7.-8.2.2007. Vydavateľstvo STU v Bratislave. p. 61-63. ISBN 978-80-227-2628-3.
- [6] Meričko, D., Lehotay, J.: Enantioseparation in HPLC: Thermodynamic Studies. In: Encyclopedia of chromatography, p. 1-9. ISBN 978-0-8247-2788-8.
- [7] Ovádeková, R., Labuda, J.: DNA binding interactions, structural damage and protection investigated by electrochemical DNA biosensors. In: Utilizing of Bio-Electrochemical and Mathematical Methods in Biological Research, p. 173-201. ISBN 81-308-0163-9.

### Articles in journals

- [1] Bruchatá, K., Sedláková, S., Čižmáriková, R., Hroboňová, K., Lehotay, J., Račanská, E.: Preparation, semipreparative HPLC isolation and pharmacological study of the derivative of (2-hydroxyphenyl)ethanone as new potential beta-blocker. In: Acta Facultatis Pharmaceuticae Universitas Comeniana, 54 (2007), p. 54-61. ISSN 0301-2298.
- [2] Ďurčeková, T., Mocák, J., Lehotay, J., Čižmárik, J.: Study of anaesthetical activity of alkoxyphenylcarbamic acid esters using statistical methods. In: Nova Biotechnologica, 7 (2007), p. 123-128. ISBN 978-80-89220-89-2.
- [3] Ferancová, A., Adamovski, M., Gründler, P., Zima, J., Berek, J., Mattusch, J., Wennrich, R., Labuda, J.: Interaction of tin(II) and arsenic(III) with DNA at the nanostructure film modified electrodes. In: Bioelectrochemistry, 71 (2007), p. 33-37. ISSN 1567-5394.
- [4] Hercegová, A., Dömötörövá, M., Matisová, E.: Sample preparation methods in the analysis of pesticide residues. In: Journal of chromatography, A 1153 (2007), p. 54-73. ISSN 0021-9673.
- [5] Hercegová, A., Dömötörövá, M., Hrouzková, S., Matisová, E.: Study on pesticide residues in apples, apple-based baby food. In: International Journal of Environmental Analytical Chemistry, 87(13/14) (2007), p. 957-969. ISSN 0306-7319.
- [6] Hroboňová K., Lehotay J., Bruchatá K., Čižmáriková, R.: Štúdium rozkladu enantiomérov potenciálneho beta-blokátora v krvnom morčacom sére metódou HPLC. In: Farmaceutický Obzor, 76 (2007), p. 309-312.
- [7] Hroboňová, K., Lehotay, J., Čižmárik, J.: Determination of quinic and shikimic acids in products derived from bees and their preparates by HPLC. In: Journal of Liquid Chromatography and Related Technologies, 30(17) (2007), p. 2635-2644.
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- [10] Kirchner, M., Ondreková, S., Matisová, E.: Automatická spektrálna dekonvolúcia na analýzu rezíduí pesticídov metódou rýchlej GC-MS. In: Chemické listy, 101 (2007), p. 220-224. ISSN 0009-2770.
- [11] Lachová, M., Lehotay, J., Čižmárik, J.: Applications of molecularly imprinted polymers in analytical and pharmaceutical chemistry. In: Česká a Slovenská farmacie = Czech and slovak pharmacy, 56(4) (2007), p. 159-164. ISSN 1210-7816.
- [12] Lachová, M., Lehotay, J., Skačáni, I., Čižmárik, J.: Extrakcia teanínu z čínskeho zeleného čaju pomocou polyméru s molekulovými odťahkami ako sorbentu pre SPE. In: Farmaceutický obzor, 76(6/7) (2007), p. 147-151. ISSN 0014-8172.
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In: Acta Crystallographica Section E, E63 (2007), o1452-o1454. ISSN 1600-5368.

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### Articles in conferences proceedings

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- [2] Benická, E., Ďurovec, I., Benisková, Z., Májek, P.: Mathematical decomposition of GC and GC-MS signal in multicomponent chromatograms. In: Book of abstracts and abbreviated papers, 13th International Symposium on Separation Sciences, 13th Advances and Applications of Chromatography in Industry, Štrbské pleso, Slovak Republic, 2007, F08. ISBN 987-80-227-2698-6.
- [3] Bruchatá, K., Sedláková, S., Čižmáriková, R., Hroboňová, K., Lehotay, J., Račanská, E.: Izolácia enantiomérov nového potenciálneho beta-blokátora semipreparatívnu HPLC a ich farmakologické hodnotenie. In: XXXVI. konferencia Syntéza a analýza liečiv, Bratislava, p. 23.
- [4] Čacho, F., Beinrohr, E., Manová, A.: On-line elektrochemická prekoncentrácia arzénu pre ETAAS. In: Anorganická analýza v životním prostredí, Cesky Tešín 2007, p. 111-119. ISBN 978-80-86380-41-4.
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## DEPARTMENT OF NMR SPECTROSCOPY AND MASS SPECTROMETRY

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### A. Teaching laboratories:

### B. Research laboratories:

Laboratory of NMR Spectroscopy (NMR)

Laboratory of Mass Spectrometry (MS)

## III. TEACHING

## IV. CURRENT RESEARCH PROJECTS

### **VEGA project No. 1/2334/05 Comparative study of gamma-aminobutyric acid metabolism as an approach for the understanding of its function in eucaryotic cells. (Tibor Liptaj)**

The main goals of the project are: a/ comparative study of the gamma-aminobutyric acid (GABA) metabolism in selected yeasts and filamentous fungi, b/ elucidation the function of GABA in fungi in the context of current hypotheses, c/ investigation of the role of GABA as a bridge of carbon and nitrogen metabolism and the role in differentiation of filamentous fungi and selected animal cells.

Project duration: from 2005 to 2007

### **VEGA projet No.2/5010/5 Study of neuroprotective effects of new pyrrolidine derivatives. (Tibor Liptaj)**

The main goals of the project are: a/ optimalization of the synthesis of new pyrrolidene derivatives, b/ development of the protocol for short-term ischemia of experimental animals, c/ implementation of monitoring of the ischemia induced morphological changes in the brain of experimental animals using NMR methods, d/ mapping of the metabolite in brain tissue of experimental animals using NMT methods

Project duration: from 2005 to 2007

### **APVV project No. 51-017905 Molecular mechanisms of the new drugs affecting oxidative stress – the important factor of the number of illnesses**

In previous VEGA projects (2/2054/22, 2/5010/5) the series of original antioxidants derived from pyridoindol stobadine was prepared. In preliminary studies it was, in accord with the theoretical assumptions found, that some of the newly prepared compounds have, in comparison with the original one, higher anti-oxidative power, lower acute toxicity and do not exhibit undesirable effects. It was found, that these compounds exhibit protect the nervous tissue against the damage caused by hypoxia or re-oxidation. It can be expected, that development of

drugs the similar properties could be valuable contribution to the therapy of neural diseases with the participation of oxidative stress. Integral part of the project is the introduction of an integral exploitation of new electrophysiological, behavioral, biochemical, physicochemical, electrochemical and morphological approaches to the study of CNS. Besides the other things, the extend of the damage of the brain of gerbils during the brain incident will be studied using methods of nuclear magnetic resonance (MRI and MRS). Also electrochemical analysis of the mechanism of the action of the new indole antioxidants with neuro-protective effects (cyclic volt – amperometry, ESR).

Project duration: from 2006 to 2009

### **State program of research and science development, Project 2003SP200280203: Establishment of the "top-class" laboratory for Nuclear Magnetic Resonance (Tibor Liptaj)**

Establishment of national NMR laboratory consisting of the group of 5 specialized NMR labs with the aim to initiate the exploitation and development of NMR methods in the broad area of natural science research and education.

Project duration: from 2003 to 2010

## **VI. COOPERATION**

### **A. Cooperation in Slovakia**

<b>Institution</b>	<b>Type of cooperation</b>	<b>Responsible person</b>	<b>Duration</b>
Jessenius Faculty of Medicine Martin	MVTS-39	Prof. MUDr. Dušan Dobrota, DrSc.	2004-2007
Medical Faculty Comenius University, Bratislava	VEGA-2/5010/25	Doc. Mudr. P. Babal, PhD.	2005-2007
Institute of Experimental Pharmacology, Slovak Academy Sciences	VEGA-2/5010/25	Doc. MUDr. S. Štolc, DrSc	2005-2007
Institute of Experimental Pharmacology, Slovak Academy Sciences	APVV-51-0179-05	Doc. MUDr. S. Štolc, DrSc	2006-2009
Institute of Experimental Pharmacology, Slovak Academy Sciences	VEGA-2/5052/25	Doc. RNDr. E. Ujházy, PhD	2005-2007
Slovak Medical University, Bratislava	APVV-2/-022004	Doc. MUDr. J. Horecký, PhD.	2005-2007
Slovak Medical University, Bratislava	ZoD	Ing. M. Cagáň,	2007
Pharmacobiochem. Lab., Medical Faculty, Comenius University Bratislava	publications	MUDr. A. Gvozdjaková, PhD; RNDr. Z. Sumbalová, PhD;	continuous
Slovak Academy Sciences, Chemical Institute, Bratislava	state program 339/2003	Ing. Miloš Hricovíni, PhD	2006-2010
Comenius University, Faculty of Natural Sciences, Bratislava	state program 339/2003	Mgr. Branislav Horváth	2006-2010
Derer Hospital, Bratislava	state program 339/2003	Doc. MUDr. V. Belan, PhD	2006-2010
Faculty of Natural Sciences UPJŠ, Košice	state program 339/2003	Doc. RNDr. J. Imrich, PhD	2006-2010
Slovak Academy Sciences, Institute of Measurement Science, Bratislava	state program 339/2003	Prof. I. Frollo, DrSc	2006-2010
Technical University, Faculty of Electrical Engineering and Information Technology, Košice	state program 339/2003	Doc. Ing. D. Olčák, PhD.	2006-2010
Comenius University, Faculty of Pharmacy, Bratislava	VEGA 1/4299/07 VEGA 1/4298/07	Prof. RNDr. E. Havránek, PhD. Ing. J. Světlík, PhD.	continuous
University of SS. Cyril and Methodius, Trnava	VEGA 1/3584/06	Prof. Ing. J. Mocák, DrSc.	2007
University of SS. Cyril and Methodius, Trnava	VEGA 1/4363/07	Doc. Ing. E. Šturdík, PhD.	2007
Research Institute of Animal Production, Nitra	ZoD, publications	Ing. R. Lahučký, PhD.	continuous
Slovnaft Bratislava	ZoD	Ing. A. Malíková, Ing. P. Valenta	continuous

Duslo Šaľa	ZoD	Ing. J.Uhlár, PhD Ing. J.Balko, PhD	continuous
Institute of Polymers, Slovak Academy Sciences	VEGA 2/6117/26 VEGA 2/3033/23	Ing. J. Lustoň, PhD. Ing. I. Lukáč, PhD.	continuous
Research Institute Soil Sciences and Conservation, Prešov	ZoD, publications	RNDr. G.Barančíková, PhD	continuous
Ananchem, Bratislava		Ing. Mičúch, PhD.	2006-2007
BELNOVAMANN, Bratislava	ZoD	Ing. M.Veverka, PhD.	2006-2007
Slovak Academy Sciences, Institute of Normal and Pathological Physiology, Bratislava		RNDr.I.Dovinová, PhD.	2006-2007
MONDI SCP Ružomberok	ZoD	Ing. E. Gemzická	2007
Novácke chemické závody, Nováky	ZoD	Ing. V. Čamaj	2007
VIPOTEST, s.r.o., Púchov	ZoD	Ing. R. Brescher	2006-2007
Hameln, rds. Modra	ZoD	Ing. P. Valchovič	2007
SPU Nitra	ZoD	Prof. J. Hudec, PhD.	2007
VUP Prievidza	ZoD	Ing. F. Halmo, PhD.	2007
T. Dérer	ZoD	Ing. T. Dérer, PhD.	2007
Zentiva, a.s. Hlohovec	ZoD	Ing. B. Proksa, DrSc.	2007

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Center for Inborn Errors of Metabolism and Pediatric Genetics, University Children's Hospital, Medical University of Vienna, Austria	Grant	Prof. M.D. Bodamer O.A.	2006-2007
Mendel University of Agriculture and Forestry, Brno		Dr. L.Pospíšilová	2007

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
T.Liptaj	Slovak Spectroscopic Society	member	2007
T.Liptaj	Slovak Chemical Society	member	2007

## D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
S.Kašparová	European Society for Magnetic Resonance in Medicine and Biology	member	2004,2005,2006, 2007
T.Liptaj	Magnetic Moments in Central Europe, Organizing committee of International NMR Symposium	member	2007

## VIII. PUBLICATIONS

### Article in journal

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### Article in conference proceedings

- [1] Bradiaková, I., Prónayová, N., Krutošíková, A.: 2-[3-(trifluoromethyl)phenyl]furo[3,2-c]pyridine derivatives.: In: International Conference on Applied Natural Sciences, Trnava, November 7-9, 2007, pp. 39-50.
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Ľubor Dlháň, PhD; Dušan Mikloš, PhD; Milan Ružička;

### PhD Students:

Radoslava Ivaniková (since 1.10.2003); Jana Jašková (since 1.10.2003); Jaroslava Maroszová (since 1.10.2004); Petra Stachová (since 1.10.2002); Jozef Švorec (since 1.10.2001); Ján Titiš (since 1.10.2004); Silvia Galková (since 1.10.2005); Jozef Malo (since 1.10.2005); Juraj Pelikán (since 1.10.2005); Zuzana Púčeková (since 1.10.2005); Ivan Šalitraš (since 2.10.2006); Rastislav Šípoš (since 1.10.2005); Zuzana Vasková (since 2.10.2006); Ivan Nemeč (since 1.10.2007); Jana Kavalirová (since 1.10.2007).

### Technical Staff:

Andrea Bočová; Valéria Habudová; Leonard Kováč; Helena Križanová; Silvia Markusová; Marta Sprušanská;

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching Laboratories:

Laboratories of Practical Exercises

### B. Research Laboratories:

Laboratory of Electrochemistry  
Laboratory of Photochemistry  
Laboratory of Magnetochemistry  
Laboratory of Thermal Processing  
Laboratory of Spectroscopy  
Laboratory of X-ray Analysis  
Laboratory of Powder Diffraction  
Laboratory of Elemental Analysis

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Inorganic Chemistry I	3/2/0	Boča, Mašlejová, Koman, Šima, Kotočová, Ondrejkočová
	Inorganic Chemistry I (Laboratory)	0/0/3	
<b>2. semester (Bc)</b>	Inorganic Chemistry II	2/2/0	Segfa
	Inorganic Chemistry II (Laboratory)	0/0/4	
<b>3. semester (Bc)</b>	Bioinorganic Chemistry	2/1/0	Valigura, Moncol
<b>1. semester (MSc)</b>	Chemical Bond and Chemical Structure	2/0/0	Boča, Šima
	Chemistry of Coordination and Organometallic Compounds	2/0/0	Ondrejovič
	Inorganic Syntheses	2/0/0	Valigura, Kotočová
	Inorganic Photochemistry	2/0/0	Šima, Izakovič

<b>1. semester (MSc)</b>	Laboratory Practice in the Major I	0/0/10	Boča, Kotočová, Ondrejkočivová, Ondrejovič, Růžička
	Laboratory Practice in the Major I	0/0/10	Segřa, Valigura
<b>2. semester (MSc)</b>	Indirect Methods of Research of Inorganic Compounds	2/2/0	Mašlejová, Boča
	Crystallochemistry	2/0/0	Mikloš, Jorík
	Laboratory Practice in the Major II	0/0/6	Jorík, Mašlejová, Mikloš
	Spectral Methods of Control Technological Processes	2/2/0	Segřa
<b>2. semester (MSc)</b>	Reaction mechanisms of Inorganic Compounds	2/0/0	Šima, Ondrejkočivová
<b>3. semester (MSc)</b>	Inorganic Materials	2/1/0	Koman
	Bioinorganic Chemistry	2/1/0	Melník, Valigura
	Laboratory of Speciality	0/0/10	Koman, Papánková, Růžička,
<b>3. semester (MSc)</b>	Inorganic Biopharmacs	2/0/0	Ondrejkočivová
	Catalysis	2/0/0	Ondrejkočivová
	Engineering of Inorganic Substances	2/0/0	Ondrejovič, Mikloš
<b>4. semester (MSc)</b>	Diploma Thesis	0/0/27	supervisors

#### IV. CURRENT RESEARCH PROJECTS

##### **VEGA Project No 1/2453/05 Tuning the Magnetoactivity of Coordination Compounds (Roman Boča).**

New theoretical strategy in calculating and predicting the magnetic parameters has been outlined. This is beyond the spin Hamiltonian formalism and it includes all the relevant interactions in mononuclear complexes. The corresponding program handles the complete space spanning by the crystal-field multiplets and Zeeman levels. An extensive modeling of magnetic functions has been done for all  $d^n$  electron configurations of transition metals. See monograph: R. Boča: Struct. Bonding 117 (2006) 1-264. Magnetic Parameters and Magnetic Functions in Mononuclear Complexes Beyond the Spin-Hamiltonian Formalism.

Project duration: from 01. 01. 2005 to 31. 12. 2007

##### **MVTS Project No NEM/Slov/DAAD/Darm05 Magneto-structural relationships for novel substances and materials (Roman Boča).**

New type of the magnetostructural correlation in mononuclear complexes has been outlined; magnetic anisotropy parameter D (that is the axial zero-field splitting) correlates with the structural distortion given by the departure of the chromophore from the octahedral symmetry. This knowledge could be of a key importance for a rational design of single-molecule magnets and a fine tuning of their properties. See: R. Ivaniková, R. Boča, L. Dlháň, H. Fuess, A. Mašlejová, V. Mrázová, I. Svoboda, J. Titiš: Polyhedron 25 (2006) 3261-3268. Heteroleptic nickel(II) complexes formed of N-donor bases, carboxylic acids, and water: Magnetostructural correlations

Project duration: from 01. 01. 2005 to 31. 12. 2007

##### **MVTS Project No NEM/Slov/DFG/CH Molecular Electronic Multistability (Roman Boča).**

Spin crossover phenomenon was studied by several experimental techniques: SQUID magnetometry and Moessbauer spectroscopy on novel polynuclear substances. The prepared iron(II) and Fe(III) complexes show a temperature-induced spin crossover. In the case of dinuclear and polynuclear complexes a stepwise process is relevant (multistep spin crossover).

Project duration: from 01. 01. 2002 to 31. 12. 2007

##### **APVT Project No 20-005204 Magnetostructural Correlations in Unconventional Magnetic Materials (Roman Boča).**

Polynuclear complexes have been synthesized and their magnetoactivity investigated in detail. By a simultaneous analysis of the temperature dependence of the magnetic susceptibility and a field dependence of

the magnetization the key magnetic parameters have been withdrawn: the exchange coupling constant, the axial zero-field splitting parameter D and the magnetogyric ratio g for individual centers.

See: a) C. G. Efthymiou, C. P. Raptopoulou, A. Terzis, R. Boča, M. Korabic, J. Mrozinski, S. P. Perlepes, E. G. Bakalbassis: *Eur. J. Inorg. Chem.* (2006) 2236–2252.

A Systematic Exploration of Nickel(II)/Acetate/Di-2-pyridyl Ketone Chemistry: Neutral and Cationic Tetranuclear Clusters, and a Novel Mononuclear Complex

b) O. Atakol, R. Boča, I. Ercan, F. Ercan, H. Fuess, W. Haase, R. Herchel: *Chem. Phys. Lett.* 423 (2006) 192–196  
Magnetic properties of trinuclear Ni-M-Ni complexes, M = Mn, Co and Ni

Project duration: from 01. 08. 2005 to 31. 12. 2007

#### **STEFANIK Project (France-Slovakia) Modeling of the photoswitchable molecular magnetic materials (Roman Boča).**

Spin crossover systems exhibiting thermal hysteresis along with a thermochromic effect can be exploited as new systems for data-recording and displaying units. Photoswitchable magnetic molecular materials are applicable in a superfast data recording/reading process for a new generation of computers and other devices.

Project duration: from 01. 01. 2006 to 31. 12. 2007

#### **STEFANIK Project (France-Slovakia) Modeling of the photoswitchable molecular magnetic materials (Roman Boča).**

Spin crossover systems exhibiting thermal hysteresis along with a thermochromic effect can be exploited as new systems for data-recording and displaying units. Photoswitchable magnetic molecular materials are applicable in a superfast data recording/reading process for a new generation of computers and other devices.

Project duration: from 01. 01. 2006 to 31. 12. 2007

#### **VEGA Project 1/4454/07 Synthesis and study of new “small” molecules with beforehand anticipate structure and properties (Marian Koman).**

The concept of "small molecules" includes compounds having the molecular weight less than  $5000 \text{ g}\cdot\text{mol}^{-1}$  (IUCr definition). This project deals with complex compounds, mainly of Cu(II), Co(II), Fe(II) and Fe(III), Ni(II), Zn(II), Cd(II), but also of other transition metal elements, exhibiting anticipated structure and, thus, also properties. Three groups of new compounds will be prepared. Carboxylato (aryl, alkyl, pyrazine, triazine) complexes, possibly with di- or polycarboxylato anionic and neutral ligands will be studied from the point of view of biological activity and expected magnetic properties. Utilizing bridging carboxylate anions of acids, like pyridine-2,3-dicarboxylic acid and pyridine-2,5-dicarboxylic acid, 2-hydroxynicotinic acid, 6-hydroxynicotinic acid and the like, different modes of ligand coordination (chelating, bridging or combined) and hence diversity of the corresponding structure types will be investigated. Prepared new compounds will be examined from the point of view of catalytic, especially oxidation-reduction properties (complexes of iron with tertiary phosphanes, arsanes and their oxo-compounds), as well as from the point of view of eco-toxicological aspects.

Project duration: from 01. 01. 2007 to 31. 12. 2007

#### **VEGA Project 1/2452/05 Novel Complexes of Bioligands: Synthesis, Structure, Properties and Applicatios (Milan Melník).**

Investigation of new metal complexes exhibiting controlled antiphlogistic and antituberculosic effects is an important task of contemporary bioinorganic chemistry. The project is focused on a complete research of the formation, structure, properties and practical applications of copper, iron, zinc and other metal complexes with non-steroid antiphlogistics (derivatives of salicylic and propionic acids, fenamates) and antituberculosics (derivatives of quinolons, nicotinic acid, nicotinamide, pyridylcarbinol and imidazole). The synthesized complexes will be studied as solids and in the solutions by x-ray diffraction of crystals and powders, spectral, magnetic, thermal, electrochemical and photochemical methods. Obtained characterization of the compounds will be compared and confronted with literature data in order to extract trends related to important biological aspects. A basic biological screening of the prepared complexes will be focused on cytotoxicity and its mechanisms. Conclusions about relation between the chemical structure and the cytotoxic activity will be formulated and applied to preparation of new substances.

Project duration: from 01. 01. 2005 to 31. 12. 2007



**APVT Project APVT-20-005504 Synthesis and investigation nonsteroidal antiflogistics based on copper(II) complexes (Milan Melník).**

The submitted project is aimed at studying conditions of preparation, electronic, vibrational and EPR spectra, molecular and crystal structures of solid Cu(II) complexes with ligands of therapeutical importance, such as derivatives of salicylic, propionic, fenamatic acids, and with neutral ligands. In addition, an attention will be paid to solution properties of the complexes, particularly to their speciation. Biological screening will be performed. Redox behaviour of the complexes using electrochemical and photochemical methods will be investigated and compared to that of analogous iron complexes with structural and functional model compounds. Most of experimental work will be carried out at Department of Inorganic Chemistry. The results obtained will be published in CC journals and presented at conferences, or patented.

Project duration: from 01. 01. 2005 to 31. 12. 2007

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Pharmaceutical Faculty, Comenius University, Bratislava	Synthesis and spectral properties of Schiff base with Cu(II) complexes	Valent Aladár, Assoc. professor, Kalinčiaková 8, 832 32 Bratislava	2002 -
Medical Faculty, Comenius University, Bratislava	Cu(II) Schiff-base complexes as perspective antidotes	Čársky Jozef, professor, Sasinkova 10, 813 72 Bratislava	2000 -

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Materials Science, University of Technology, Darmstadt, Germany	New Crystal, Molecular, Electronic and Magnetic Structures with Functional Properties	Fuess Hartmut, professor, Petersenstrasse 23, 64287 Darmstadt, Germany	1994 -
Institute of Inorganic Chemistry, Johannes-Guttenberg-University, Mainz, Germany	Molecular Electronic Multistability	Renz Franz, Dr., Staudinger Weg 9, D-55099 Mainz, Germany	2002 -
Institute of Applied Synthetic Chemistry, Vienna University of Technology, Vienna, Austria	Coordination Compounds with Interesting Magnetic Properties	Linert Wolfgang, professor, A-1060 Vienna, Austria	1998 -
Institute of Inorganic and Physical Chemistry, University of Technology, Darmstadt, Germany	New Crystal, Molecular, Electronic and Magnetic Structures with Functional Properties	Haase Wolfgang, professor, Petersenstrasse 23, 64287 Darmstadt, Germany	1994 -
Department of Chemistry, University of Puerto Rico, San Juan, USA	Magnetism of Multinuclear Coordination Compounds and Clusters	Raptis Raphael, professor, San Juan, PR 00931-3346, USA	1994 -
Institute of Solid State Chemistry, Faculty of Chemical Technology, Prague, Czech Republic	RTG analysis of monocrystals and powders	Kratochvíl Bohumil, professor, Technická 5, 16628 Prague 6, Czech Republic	1992 -
York University, Toronto, Canada	X-ray analysis of transition and non-transition metal atoms	Holloway Clive Eduard, director, 4700 Keele Street, North York M3J 1P3, Toronto, Ontario, Canada	1976 -
University of Helsinki, Helsinki, Finland	X-ray analysis of solid compounds	Sundberg Markku, professor, A. I. Virtasen aukio 1, P.O. Box 55, Helsinki, Finland	1968 -
Department of Chemistry, University of Jyväskylä, Yyveskilä, Finland	X-ray analysis of solid compounds	Sillanpää Reijo, professor, FIN-40351 Jyväskylä, Finland	2003 -
Wroclaw University, Wroclaw, Poland	Magnetic properties of solid compounds	Mrozinski Jerzy, professor, 14, F. Joliot-Curie str, 50-383 Wroclaw, Poland	1972 -

Okayama University, Okayama, Japan	Synthesis and magnetic properties of solid compounds	Kojima Masaaki, professor, Tsushima, Okayama, 700-8530 Japan	2003 -
Aoyama Gakuin University, Tokyo Japan	Schiff bases and chemistry of copper complexes	Hasegawa Miki, professor, 6-16-1 Chitosedai Setagaya-ku, Tokyo, 157-8572 Japan	2003 -
Kwansei Gakuin University, Osaka, Japan	Magnetic and spectral properties solid compounds	Mikuriya Masahiro, professor, 2-1 Gakuen, Sanda 669-1337, Japan	2003 -
Ochanomizu University, Tokyo, Japan	PhD students exchange	Fukuda Yutaka, professor, Ochanomizu University, 2-1-1 Otsuka, Bunkyo-ku 112-8610, Tokyo, Japan	2003 -

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Koman Marian	Slovak Expert Group of Solid State Chemistry and Physics	chairmann	01. 06. 1985 -
Koman Marian	Regional Committee of Czech and Slovak Crystallographers	president	01. 01. 1992 -
Koman Marian	Czech and Slovak Association for Crystal Growth	member	01. 02. 1994 -
Koman Marian	Slovak Society for Industrial Chemistry	member	01. 01. 1985 -
Moncol' Ján	Czech & Slovak Crystallographic Association	member	01. 07. 2001 -
Ružička Milan	The Czechoslovak Association for Crystal Growth	vice-president	1991 -
Ružička Milan	Slovak Expert Group of Solid Chemistry and Physics	other	1975 -

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Koman Marian	Slovak Expert Group of Solid State Chemistry and Physics	chairmann	01. 06. 1985 -
Koman Marian	Regional Committee of Czech and Slovak Crystallographers	president	01. 01. 1992 -
Koman Marian	Czech and Slovak Association for Crystal Growth	member	01. 02. 1994 -
Moncol' Ján	Czech & Slovak Crystallographic Association	member	01. 07. 2001 -
Ružička Milan	The Czechoslovak Association for Crystal Growth	vice-president	1991 -
Ružička Milan	Slovak Expert Group of Solid Chemistry and Physics	other	1975 -
Melník Milan	American Chemical Society	member	1998 -
Melník Milan	Finnish Chemical Society	member	1974 -
Melník Milan	Editorial board of MGMC	member	1998 -
Izakovič Mário	European Photochemistry Association	member	01. 01. 1997
Tatarko Miroslav	European Photochemistry Association	member	01. 01. 1996

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Pochaba, A.	University of Wroclaw	Poland	January 2007 (7 days)
Fuess, H.	Technical University Darmstadt	Germany	June 2007 (3 days)
Grobelny, R.	University of Wroclaw	Poland	June 2007 (6 days)
Gyurcsik, B.	University of Szeged	Hungary	June 2007 (6 days)
Mrozinski, J.	University of Wroclaw	Poland	June 2007 (6 days)
Svoboda, I.	Technical University Darmstadt	Germany	June 2007 (6 days)
Szabó-Plánka, T.	University of Szeged	Hungary	June 2007 (6 days)
Epiphane, C.	University of Vesailles, Paris	France	October 2007 (5 days)
Linares, J.	University of Vesailles, Paris	France	October 2007 (5 days)
Lakatos-Karolyne, A.	University of Szeged	Hungary	November 2007 (3 days)
Szabó-Plánka, T.	University of Szeged	Hungary	November 2007 (3 days)
Jakab, N.	University of Szeged	Hungary	December 2007 (3 days)

## F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Boča, R.	Technical University, Vienna	Austria	February 2007 (2 days)
Dlháň, L.	Technical University, Darmstadt	Germany	February 2007 (12 days)
Šalitraš, I.	Palacky University, Olomouc	Czech Republic	February 2007 (3 days)
Boča, R.	Technical University, Vienna	Austria	March 2007 (1 day)
Dlháň, L.	University of Wroclaw	Poland	March 2007 (7 days)
Koman, M.	Institute of Chemical Technology, Prague	Czech Republic	March 2007 (1 day)
Boča, R.	University of Groningen	Netherlands	April 2007 (3 days)
Melník, M.	University of Osaka	Japan	April 2007 (10 days)
Melník, M.	University of Tokyo	Japan	April 2007 (10 days)
Melník, M.	University of Okayama	Japan	April 2007 (10 days)
Moncoř, J.	University of Ljubjana	Slovenia	April 2007 (1 day)
Šalitraš, I.	Technical University, Darmstadt	Germany	April 2007 (23 days)
Šima, J.	Technical University, Vienna	Austria	April 2007 (1 day)
Boča, R.	DGF "Molecular Magnetism", Bad Durkheim	Germany	May 2007 (4 days)
Koman, M.	Masaryk University, Brno	Czech Republic	May 2007 (1 day)
Mašlejová, A.	Technical University, Darmstadt	Germany	May 2007 (15 days)
Mikloš, D.	Masaryk University, Brno	Czech Republic	May 2007 (1 day)
Papánková, B.	Technical University, Darmstadt	Germany	May 2007 (15 days)
Šalitraš, I.	The European Materials Research Society Spring Meeting, Strasbourg	France	May 2007 (7 days)
Titiš, J.	The European Materials Research Society Spring Meeting, Strasbourg	France	May 2007 (7 days)
Boča, R.	University of Vesailles, Paris	France	June 2007 (10 days)
Boča, R.	Technical University, Darmstadt	Germany	July 2007 (21 days)
Melník, M.	13 <sup>th</sup> International Conference on Biological Inorganic Chemistry, Vienna	Austria	July 2007 (7 days)
Šalitraš, I.	University of Karlsruhe	Germany	October 2007 (61 days)
Šipoš, R.	University of Szeged	Hungary	December 2007 (12 days)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Bohmová, J.	Preparation and properties of nitrobenzoatocopper(II) complexes with some nitrogen donor ligands.	Valigura, D.
Kavalířová, J.	Preparation and properties of salicylatocopper(II) complexes with some biologically active ligands.	Moncoř, J.
Nemec, I.	Spincrossover in iron complexes.	Boča, R.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Jašková, J.	The Preparation and Study of structure, physico-chemical and biological properties of Cu <sup>II</sup> and Co <sup>II</sup> pyridinecarboxylates with biologically active ligands.	Segla, P.

## VIII. PUBLICATIONS

### Chapter or pages in book

- [1] Galková, S., Ondrejkočičová, I.: Spectral and structural study of iron isothiocyanato-complexes with derivatives of pyridine: Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 74-79, 2007. (in English)
- [2] Izakovič, M.: Fotochemické procesy v prírode a v biologických systémoch. In: Život okolo nás očami chemika a biológa. - : Vydavateľstvo STU v Bratislave. - ISBN 978-80-227-2707-5. - pp. 75-86, 2007. (in Slovak)
- [3] Koman, M., Melník, M., Lis, T.: Crystal structure of Cu(II), Co(II) and Ni(II) complexes with some chelating ligands : Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 151-159, 2007. (in English)
- [4] Kráľová, K., Masarovičová, E., Kubová, J., Ondrejkočičová, I.: Iron accumulation in maize treated with different Fe(III) compounds : Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 160-166, 2007. (in English)
- [5] Maroszová, J., Moncoľ, J., Lis, T., Koman, M.: Novel copper(II) complexes with 4-pyridylmethanol as a ligand : Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 167-172, 2007. (in English)
- [6] Masarovičová, E., Kráľová, K., Kubová, J., Ondrejkočičová, I.: Effect of NCS- and NCS<sub>e</sub>- ligands on cadmium and selenium accumulation in several plant species. Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 173-180, 2007. (in English)
- [7] Mazúr, M., Boňanská, P., Repická, Z., Stachová, P., Moncoľ, J., Valko, M.: EPR Study of VO(II) Ions in Silica Xerogels Calcined at Various Temperature. Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 181-190, 2007. (in English)
- [8] Moncoľ, J., Maroszová, J., Vasková, Z., Valko, M., Mazúr, M., Melník, M., Koman, M.: Structural study of copper(II) 2-chloronicotinate complexes with some pyridine derivatives: Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 208-213, 2007. (in English)
- [9] Ondrejkočičová, I., Izakovič, M.: Elektrochemické deje ? Experimenty v laboratóriu: Chémia a biológia v bežnom živote. - ISBN 978-80-227-2706-8. - pp. 7-17, 2007. (in Slovak)
- [10] Ondrejkočičová, I.: Hliník a jeho zlúčeniny okolo nás. In: Život okolo nás očami chemika a biológa. - : Vydavateľstvo STU v Bratislave. - ISBN 978-80-227-2707-5. - pp. 34 – 41, 2007. (in Slovak)
- [11] Segľa, P., Jašková, J., Mikloš, D., Melník, M.: Synthesis, Spectral and Magnetic Properties and Crystal Structures of Copper(II) Pyridinecarboxylates : Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 253-269, 2007. (in English)
- [12] Šima, J., Šipoš, R.: Redox stability of iron(III) fluoro complexes [Fe(4-R-benacen)(CH<sub>3</sub>OH)F] and its chloro and iodo analogs in methanolic solutions : Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 277-285, 2007 (in English)
- [13] Šipoš, R., Šima, J., Szabó-Plánka, T., Gyurcsik, B.: Solution properties of 5-fluorosalicylato copper(II) complexes - speciation and photochemistry : Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 286-298, 2007. (in English)
- [14] Vasková, Z., Korabik, M., Repická, Z., Moncoľ, J., Valigura, D.: Similar magnetic behaviour of monomeric [Cu(3-NO<sub>2</sub>bz)<sub>2</sub>(nia)(H<sub>2</sub>O)<sub>2</sub>] and polymeric [Cu(5-MeSal)<sub>2</sub>(mi-denia)(H<sub>2</sub>O)]<sub>n</sub> : Monograph Series of the International Conferences on Coordination and Bioinorganic Chemistry held periodically at Smolenice in Slovakia, Editors: Melník Milan, Šima Jozef, Tatarko Miroslav In: Achievements in Coordination, Bioinorganic and Applied Inorganic Chemistry. - ISBN 978-80-227-2647-4. - pp. 327-332, 2007. (in English)

### Article in journal

- [1] Bartel, M., Absmeier, A., Jameson, G.N.L., Werner, F., Kato, K., Takata, M., Boča, R., Hasegawa, M., Mareiter, K., Caneschi, A., Linert, W.: Modification of spin crossover behavior through solvent assisted formation and solvent inclusion in a triply interpenetrating three-dimensional network. Inorganic Chemistry, vol. 46, pp. 4220 – 4229, 2007. (in English)

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## DEPARTMENT OF INORGANIC TECHNOLOGY

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## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Molten Salt Chemistry Laboratories  
Laboratories of Chemical Inorganic Syntheses and Industrial Inorganic Chemistry

### B. Research laboratories:

Molten Salt Chemistry and Electrochemistry Laboratories  
Technical Electrochemistry Laboratories  
Electroplating, Special Coatings and Corrosion Laboratories

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Inorganic Technologies	2/3/0	Gabčová, Híveš
	Inorganic Technologies and Materials	2/0/0	Gabčová, Híveš
<b>5. semester (Bc)</b>	Chemical and Food Technology	2/1/0	Danielik, Ambrová
<b>5. semester (Bc)</b>	Corrosion and Material Surface Treatment	2/0/2	Chovancová
<b>1. semester (MSc)</b>	Phase Equilibria	1/2/0	Gabčová
	Corrosion and Material Protection	2/1/0	Chovancová, Zemanová
	Applied Thermodynamics	2/2/0	Fellner, Danielik
	Laboratories I.	0/0/8	Gabčová, Híveš, Chovancová, Žúžiová
	Inorganic Technology II.	2/0/0	Gabčová, Híveš, Šíma
<b>2. semester (MSc)</b>	Chemical Reaction Engineering	2/2/0	Híveš, Danielik
	Applied Electrochemistry	2/2/0	Híveš
	Laboratories II.	0/0/8	Gabčová, Híveš, Chovancová, Žúžiová
<b>3. semester (MSc)</b>	Fertilizers	2/0/0	Gabčová
	Electrochemical Engineering	1/1/0	Híveš, Fellner
	Elements of System Engineering	1/1/0	Danielik
	Laboratories III.	0/0/10	Danielik, Fellner, Gabčová, Híveš, Chovancová,
<b>4. semester (MSc)</b>	Diploma work	0/0/27	



## IV. CURRENT RESEARCH PROJECTS

### **VEGA Project No 1/2109/05 The Use of the Pulse Technique on the Preparation of the Composite and Alloy Layers on the Metal Substrates (Marta Chovancová)**

Ni-W alloy coatings were prepared on the steel substrate. The content of tungsten in coatings was increased with the growing current density and the corrosion resistance raised with the tungsten content as well. Annealed coatings showed better anticorrosion properties than the non-annealed ones.

The preparation of electrochemical composite coatings with nickel matrix and PTFE dispersion particles has been studied and their mechanical properties has been evaluated.

The participation of solid Fe powder particles in the transfer of charge through the heterogeneous system consisting of an electrolyte and conducting powder particles was studied by means of electrochemical impedance spectroscopy.

The quality of coloured anodic oxidation layer of aluminium was analysed in dependence on alternative and pulse reverse current and used pigmentation electrolyte. The quality of the pigmentation is determined not only by the nickel content but the morphology of the deposited nickel as well.

Project duration: from January 2005 to December 2007

### **VEGA Project No 1/2108/05 The Chemical and Electrochemical Reactions of Sulphur Species at Aluminium Electrolysis (Pavel Fellner)**

The effect on the cathode and anode reactions when adding sodium sulphate to molten chlorides and fluorides was investigated by chronopotentiometry and cyclic voltammetry in the temperature range 820 °C – 1000 °C. The cathode process was explained under the assumption that Na<sub>2</sub>SO<sub>4</sub> thermally dissociates into Na<sub>2</sub>O and SO<sub>3</sub>, which is the electroactive species. The formation of sulphide was observed. The influence of sulphide on aluminium electrolysis will be discussed. The anode reaction of sulphate depends on the electrode material. On gold electrodes, no electrochemical activity of sulphate was observed. However, when a platinum anode was used, sulphate was oxidized to oxygen and SO<sub>3</sub> that decomposed thermally. When a normal carbon anode was used, the presence of COS and SO<sub>2</sub> in the anode gas leaving the laboratory aluminium cell was observed.

Adsorption of SO<sub>2</sub> on alumina used in the aluminium industry (so-called smelter-grade alumina) was studied in the temperature range 15 °C – 120 °C. The specific surface area of the smelter grade alumina was 88 m<sup>2</sup>/g. It was found that at temperatures lower than 40 °C, sulphur dioxide is bonded to alumina reversibly by physical forces, and the adsorption can be described satisfactorily by the Langmuir adsorption isotherm. The heat of adsorption was estimated to be -33 kJ.mol<sup>-1</sup>.

At temperatures in the range 80 °C – 120 °C, which prevail in dry scrubbers in the aluminium industry, the heat of adsorption was determined to be -56 kJ.mol<sup>-1</sup>. When SO<sub>2</sub> was adsorbed at temperatures higher than 80 °C, about 30 % of the SO<sub>2</sub> could not be desorbed when the samples were heated up to 250 °C. In the presence of SO<sub>2</sub> and oxygen, the formation of sulphate was determined at temperatures higher than 90 °C.

Project duration: from January 2005 to December 2007

### **VEGA Project No 1/2476/05 Ferrates– Thermodynamics and Kinetics of Chemical and Electrochemical Reactions in Molten Electrolyte and on the Phase Boundary Electrode - Electrolyte (Ján Híveš)**

The main aim of this project was to examine the possibility of the preparation and provide first information on the behaviour of the iron in a transpassive region of potentials in molten hydroxides environment.

Electrochemical measurements (cyclic voltammetry and chronopotentiometry) were performed in eutectic mixture of NaOH-KOH. A maximum value of polarization potential in anodic way plays very important role in the ferrate (VI) formation. Increasing of potential does not result in production of higher amount of ferrate (VI) but competitive reaction (evolution of oxygen) is getting more intensive. In the beginning of the DC electrolysis process the high current efficiency (91%) is reached but quickly decreases in time of electrolysis down to 14% at the lower temperatures. Regarding the higher temperatures at the beginning of electrolysis is reached the current efficiency equal to 72%. Then with increasing time of electrolysis the current efficiency drops slowly down to the value of 47% (3 h).

Project duration: from January 2005 to December 2007

## APVT Project No APVT-20-000204 Electrochemical Deposition of Lanthanum from Fluoride Melts (Marta Ambrová)

The spent nuclear fuel treatment is one of the alternatives to the present storage of spent fuel in deep geological storages. The present used ways are based on the neutron source. The possibility of using of chemical separation processes is under study, too. No one commercial cycle exists which could be fully satisfactory. The separation processes in the melts were studying in 50<sup>th</sup> years. But they were not implemented because of high requirements on materials. These processes are realized at the temperature higher than 500 °C and used chemical agents are very aggressive. It means that there are serious problems at choosing of appropriate construction materials.

The separation process of lanthanides and actinides is partially handled in chloride melts. However, this process does not suit the concept of the new types of reactors, where the fluoride melts are considered as carrier melts. It is important to handle the separation process from fluoride melts. In Czech Republic in Nuclear Research Centre in Řež, the technology based on the distillation of volatile fluorides was proposed. Uranium species can be distilled as UF<sub>6</sub> from the spent fuel. Solid fluoridated products and non-fluoridated species remain in the distillation residue (plutonium, actinides, ...). Electroseparation could be used to separate these species.

New knowledge on the properties of the possible melt systems is needed for electroseparation. At present, the thermodynamic properties of the pure compounds, a few relevant phase diagrams and some "standard" (but inconsistent) electrochemical potentials of lanthanides and actinides compounds are available.

Electrodeposition of lanthanum was chosen as a model system. Different methods of the electrodeposition can be tested in the model system. The main objective is split into the following steps:

- solubility of lanthanum compounds in fluoride melts,
- construction of the high-temperature electrolytic cell with exactly defined conditions,
- electrode materials for electrodeposition with lanthanum depolarisation,
- electrolytic deposition of lanthanum from the appropriate electrolyte,
- influence of the pulse electrolysis.

Project duration: from January 2005 to December 2007

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
VUJE, Trnava	Transmutation of spent nuclear fuel	Ing. Petr Dařílek	January – December 2007
VUCHT, Bratislava	Study of changes of active ZnO Calculation of the thermodynamic functions	doc. Ing. M. Králik, PhD.	March – December 2007
SHMÚ	Balance of green house emissions	Ing. J. Szemesová, PhD.	May – November 2007

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
SINTEF, Norway	Transference numbers in melts	Prof. Jomar Thonstad	January - December 2007
VUT Brno, Czech Republic	Corrosion of metals in melts	Prof. O. Mátal	August – November 2007

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
M. Chovancová	Slovak Society for Surface Treatment and Technology	other	since 1995
M. Chovancová	Slovak Chemical Society	member	since 1987
M. Chovancová	Slovak Cleaner Production Centre	member	since 1993
M. Chovancová	Union of Slovak Scientific and Technological Societies	member	since 1972
J. Hiveš	Slovak Society for Surface Treatment and Technology	member	since 1987

<b>J. Hiveš</b>	Slovak Chemical Society	member	since 2000
<b>J. Hiveš</b>	Union of Slovak Scientific and Technological Societies	member	since 1987
<b>J. Gabčová</b>	Slovak Chemical Society	member	since 1972
<b>J. Gabčová</b>	Union of Slovak Scientific and Technological Societies	member	since 1972
<b>V. Khandl</b>	Union of Slovak Scientific and Technological Societies	member	since 1972
<b>V. Danielik</b>	Slovak Chemical Society	member	since 1992
<b>M. Zemanová</b>	Slovak Chemical Society	member	since 1992
<b>M. Zemanová</b>	Slovak Society for Surface Treatment and Technology	member	since 1995
<b>P. Fellner</b>	Slovak Chemical Society	member	since 1972
<b>P. Fellner</b>	Union of Slovak Scientific and Technological Societies	member	since 1972
<b>P. Fellner</b>	Slovak Society for Surface Treatment and Technology	member	since 1995
<b>P. Fellner</b>	Scientific Board of UACH SAV	member	since 2003
<b>P. Fellner</b>	Scientific Board of Faculty of Technology of University of Trenčín	member	since 2003
<b>M. Ambrová</b>	Slovak Chemical Society	member	since 2004
<b>J. Jurišová</b>	Slovak Chemical Society	member	since 2004

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
<b>P. Fellner</b>	EFCE, group Electrochemical Engineering	member	since 1999
<b>J. Hiveš</b>	International Society of Electrochemistry	member	since 2000

#### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
<b>Prof. J. Thonstad</b>	SINTEF, Trondheim	Norway	December 2006 (3 days)
<b>Dr. K. Bouzek</b>	VŠCHT, Praha	Czech Republic	December 2007 (2 days)
<b>Prof. V. Sharma</b>	FIT Melbourne	Florida, USA	December 2007 (2 days)
<b>Prof. V. Malyshev</b>	KPI Kiev	Ukraine	September 2007 (1 week)
<b>Dr. A. Gab</b>	KPI Kiev	Ukraine	September 2007 (1 week)
<b>P. Vodehnal</b>	LECOM, Ledec nad Sázavou	Czech Republic	June 2007 (2 days)
<b>M. Palko</b>	IDEAL-Trade Servis, Brno	Czech Republic	June 2007 (2 days)
<b>P. Szelag</b>	PRAGOCHEMA, Praha	Czech Republic	June 2007 (2 days)
<b>L. Obr</b>	MAG galvanochemie, Jablonec nad Nisou	Czech Republic	June 2007 (2 days)
<b>J. Kudláček</b>	Fakulta strojní, ČVUT, Praha	Czech Republic	June 2007 (2 days)
<b>Dr. V. Kreibich</b>	Fakulta strojní, ČVUT, Praha	Czech Republic	June 2007 (2 days)
<b>D. Veselý</b>	Univerzita Pardubice	Czech Republic	June 2007 (2 days)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
<b>M. Ambrová</b>	IYCE2007, Budapest	Hungary	May/June 2007 (3 days)
<b>V. Danielik</b>	AER Working Group „F“, Třešť	Czech Republic	April 2007 (3 days)
<b>V. Danielik</b>	SÚRAO, Praha	Czech Republic	December 2007 (1 day)
<b>P. Fellner</b>	VŠCHT Praha	Czech Republic	May 2007 (2 days)
<b>P. Fellner</b>	VŠCHT Praha	Czech Republic	June 2007 (2 days)
<b>P. Fellner</b>	KPI Kiev	Ukraine	October 2007 (1 week)
<b>J. Gabčová</b>	KPI Kiev	Ukraine	October 2007 (1 week)
<b>J. Hiveš</b>	VŠCHT Praha	Czech Republic	February 2007 (2 days)
<b>J. Hiveš</b>	VŠCHT Praha	Czech Republic	May 2007 (2 days)
<b>J. Hiveš</b>	VŠCHT Praha	Czech Republic	June 2007 (2 days)
<b>J. Hiveš</b>	VŠCHT Praha	Czech Republic	October 2007 (2 days)
<b>M. Zemanová</b>	Happy Plating, GmbH	Austria	March 2007 (1 day)
<b>M. Zemanová</b>	ZVO Oberflächentage Bonn	Germany	September 2007 (3 days)
<b>M. Zemanová</b>	TU Darmstadt	Germany	June 2007 (2 weeks)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Červenková, M.	Electrochemical properties of the melts containing lanthanum fluoride	Ambrová, M.
Gál, M.	Pigmentation of anodised aluminium coatings	Zemanová, M.
Figlár, M.	Iron in molten salt environment	Híveš, J.
Lencsés, M.	Preparation of silicon Nitride Ceramics Based on SiAlOC and Rare Earth Metal Oxides Additives	Fellner, P.
Mesárošová, M.	Phase diagrams of the systems with refractory metals compounds	Gabčová, J.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Z Galíková	Electrolytic deposition of Ni-W alloys	Chovancová, M.
J. Jurišová	Sulphur Species as Impurities in Aluminium Electrolysis	Fellner, P.
M. Benová	Electrochemical preparation of ferrate(VI) in molten salt	Híveš, J.

## VIII. PUBLICATIONS

### Chapters or Pages in Books

- [1] Híveš, Ján, Benová, Michaela, Uher, Dalibor: Železany-univerzálna "zelená" chemikália pre odpadové vody. Povrchové úpravy materiálov, Editor: Chovancová, Marta, Danielik, Vladimír, STU v Bratislave, pp73-78, 2007.
- [2] Zemanová, Matilda, Blaho, Pavol, Ušák, Elemír, Gálíková, Zuzana, Chovancová, Marta: Pigmentácia anodicky oxidovaného hliníka impulzovým reverzným prúdom. Povrchové úpravy materiálov, Editor: Chovancová, Marta, Danielik, Vladimír, STU v Bratislave, pp. 67-72, 2007.

### Article in journal

- [1] Ambrová, Marta, Fellner, Pavel, Jurišová, Jana, Thonstad, Jomar: Electrode Processes of Sulphur Species in Molten Salts. Light Metals, vol. 2007, pp. 363-368, 2007.
- [2] Boča, Miroslav, Danielik, Vladimír, Ivanová, Zuzana, Mikšíková, Eva, Kubíková, Blanka: Phase Diagram of the  $KF - K_2TaF_7$  and  $KF - Ta_2O_5$  Systems. Journal of Thermal Analysis and Calorimetry, vol. 90, pp. 159-165, 2007.
- [3] Gál, Miroslav, Híveš, Ján, Benová, Michaela, Gálová, Miriam: Electrochemical Impedance and Conductivity Measurements in a Heterogeneous Fe powder Particle Electrolyte System with or without Electrochemical Reaction. Journal of Applied Electrochemistry, vol. 37, pp. 737-746, 2007.
- [4] Chovancová, Marta, Gálíková, Zuzana, Zemanová, Matilda: Vlastnosti zliatinových Ni - W povlakov vylučovaných jednosmerným impulzným prúdom. Acta Mechanica Slovaca, no. C, vol. 4, pp. 96-101, 2007.
- [5] Chovancová, Marta, Zemanová, Matilda: Korózia kovových konštrukčných materiálov v prostredí kvapalných surovín na výrobu priemyselných hnojív. Korózie a ochrana materiálu, vol. 51, pp. 7-11, 2007.
- [6] Kuchřík Marián, Šimko František, Danielik, Vladimír, Boča, Miroslav, Vasiljev, Roman: Thermal Analysis of the System  $Na_3AlF_6 - NaVO_3$ . Monatshefte für Chemie, vol. 138, pp. 1211-1215, 2007.
- [7] Malyshev, Viktor, Gab, Angelina, Astrelin, Igor, Ambrová, Marta, Danielik, Vladimír, Fellner, Pavel: Study of Cathode Product Composition and Structure Tungstate, Molybdate and Tungstate-Molybdate Melts. Charkovskaya nanotechnologicheskaya Assambleya, UDK 669.1+669.2/8, p. 120, 2007.

### Article in conference proceedings

- [1] Ambrová, Marta, Fellner, Pavel, Jurišová, Jana, Thonstad, Jomar: Electrode Processes of Sulphur Species in Molten Salts. In TMS 2007, 139<sup>th</sup> Annual Meeting, Orlando, Florida, CD, pp. 363-368, 2007.
- [2] Ambrová, Marta, Danielik, Vladimír, Jurišová, Jana: The Electrochemical Behaviour of Lanthanum Fluoride in Molten Alkali Fluorides.

- In 59. Zjazd chemických spoločností, Vysoké Tatry, p.97, 2007.
- [3] Ambrová, Marta, Danielik, Vladimír, Jurišová, Jana: In International Youth Conference on Energetics, Budapest, pp. 209-210, 2007.
  - [4] Ambrová, Marta: Elektrochemické vlastnosti modelovej sústavy na separáciu vyhoreného MOX paliva. In Jaderná energetika v pracích mladá generace, VUT Brno, pp. 63-65, 2007.
  - [5] Híveš, Ján, Benová, Michaela, Uher, Dalibor: Železany-univerzálna "zelená" chemikália pre odpadové vody. In 49. Medzinárodná galvanická konferencia, Bratislava, p.10, 2007.
  - [6] Chovancová, Marta, Fellner, Pavel, Zemanová, Matilda: Moderné trendy v povrchových úpravách. In 11. Medzinárodná konferencia Mechanical Engineering, Bratislava, CD, 2007.
  - [7] Zemanová, Matilda, Chovancová, Marta: Pasivačné vrstvy na pulzne vylúčenom zinkovom povlaku. In 40. Aktiv galvanizérů, Jihlava, CD pp.54-57, 2007.
  - [8] Zemanová, Matilda, Blaho, Pavol, Ušák, Elemír, Gáliková, Zuzana, Chovancová, Marta: Periodic – Reverse Current Nickel Pigmentation of Anodised Aluminium. In 2. Europea Pulse Plating Seminar, Vienna, CD, 2007.
  - [9] Zemanová, Matilda, Blaho, Pavol, Ušák, Elemír, Gáliková, Zuzana, Chovancová, Marta: Pigmentácia anodicky oxidovaného hliníka impulzovým prúdom. In 49. Medzinárodná galvanická konferencia, Bratislava, p.9,2007.
  - [10] Zemanová, Matilda, Chovancová, Marta: Corrosion Resistance of Pulse Current Electrodeposited Zinc from Acid and Alkaline Electrolytes. In 1. International Symposium Industrial Toxicology 07, Bratislava, pp. 21-25, 2007.
  - [11] Zemanová, Matilda, Chovancová, Marta: Einfluss der Zinkpulsabscheidung auf Korrosionsschutz von Stahl. In ZVO Oberflächentage, Garmisch-Partenkirchen, CD, 2007.

## DEPARTMENT OF CERAMICS, GLASS AND CEMENT

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## I. STAFF

### Full Professors:

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### Associate Professors:

Miroslav Jamnický, PhD; Martin T.Palou, PhD;

### Assistant Professors :

Vladimír Kovár, PhD; Eva Smrčková, PhD;

### Research Fellows:

Jozef Kákoš, PhD; Jana Kozánková; Štefan Svetík;

### PhD Students:

Martin Dovál (till 30.4.2007); Ľubomír Ježo; Eva Kuzielová (till 30.9.2007); Maha Salih Mohamed Noaman; Zora Bazelová (since 1.10.2007); Kristína Vicenová; Martin Vitkovič;

### Technical staff:

Pavol Krutý; Iveta Zezulová;

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Teaching laboratory I  
Teaching laboratory II

### B. Research laboratories:

Laboratory of ceramics  
Laboratory of glass  
Laboratory of inorganic binders  
Laboratory of sol/gel  
Laboratory of inorganic powders synthesis  
Laboratory of thermal analysis  
Laboratory of calorimetry  
Scanning electron microscopy laboratory  
X-ray diffractometer laboratory  
Laboratory of X-Ray Microanalysis

## III. TEACHING

### A. Undergraduate Study:

<b>2. semester (Bc)</b>	Inorganic materials	2/2/0	Jamnický, Smrčková
<b>5. semester (Bc)</b>	Ceramic materials	2/2/0	Palou, Smrčková
	Technical mineralogy	2/0/0	Lokaj, Svetík
<b>6. semester (Bc)</b>	Materials technology	2/0/0	Palou
	Bachelor's thesis	0/0/4	Palou
<b>1. semester (MSc)</b>	Inorganic chemistry III	2/2/0	Jamnický
<b>2. semester (MSc)</b>	High temperature processes	2/1/0	Kovár
	Applied heat technique	2/1/0	Kovár
	Specialised laboratory practices II	0/0/8	Smrčková
	Factory praxis	three weeks	Jamnický, Smrčková
<b>3. semester (MSc)</b>	Technology of spec. inorg. materials	2/0/0	Kákoš, Palou
	Inorganic binders technology	2/0/0	Palou

	Technology of ceramics	2/0/0	Smrčková
	Technology of glass	2/0/0	Jamnický
<b>3. semester (MSc)</b>	Specialised laboratory practices III	0/0/10	Jamnický, Palou, Smrčková
<b>4. semester (MSc)</b>	Master's thesis laboratory	0/0/27	Kovár, Palou, Smrčková

## IV. CURRENT RESEARCH PROJECTS

### APVV Project 20-015904: New biomaterials and biosensors for clinical use (Ján Labuda).

Synthesis of new bioinorganic materials for clinical application as well as biosensors based on deoxyribonucleic acid (DNA) and lipoproteins (LDL) for direct use in clinical medicine. The project, as it is solved at Department of Ceramics, Glass and Cement, deals with the synthesis of composite biomaterials based on inorganic - organic and inorganic-inorganic biomaterials. The main purpose of the work is the precipitation in-situ of hydroxyapatite in the matrix of biopolymers (PVA) in order to optimize the mechanical strength and bioactivity of novel biomaterials. Also, the project is aimed at the synthesis of composite biomaterials fluor-hydroxyapatite and study of mechanical strength, microstructure, thermal stability, biocompatibility and bioactivity. Other important field of project is the development of bioglass and bioglass ceramics in lithium disilicate – fluorapatite system. Kinetics and mechanism of thermo-nucleation and crystallization, mechanical properties, bioactivity of glass and glass-ceramics with different content of “apparent fluorapatite” are the main investigation points of the project.

Project duration: from 01.01.2005 to 31.12.2007

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person
Slovak University of Technology, Faculty of Mechanical Engineering, Trnava	Isostatic pressing of ceramic powders	Turňa Milan, professor, Paulínska 16, 917 24 Trnava
University of Žilina, Faculty of Mechanical Engineering, Department of Physics, Žilina	Study of mixed cation effect in ion conductivity glasses using electrical conductivity spectra, study of transport mechanisms in fast i	Bury Peter, professor, 010 26 Žilina
Slovak Academy of Sciences, Institute of Inorganic Chemistry, Bratislava	$\alpha$ -alumina ceramics prepared by colloidal processing	Šajgalík Pavol, director, Dúbravská cesta 9, 843 69 Bratislava
Slovak Academy of Sciences, Institute of Construction and Architecture, Bratislava	The performances of blended cements based on sulfoaluminate belite and Portland cement	Janočka Ivan, researcher, Dúbravská cesta 9, 842 20 Bratislava
Ipeľské tehelne, a.s., Lučenec (Brick plant)	Mineralogical and thermoanalytical investigation of local raw materials for brick production	Dováľ Martin, director, M. Rázusa 29, 984 01 Lučenec
Novoker, a.s., Lučenec (Wall Tiles Producer)	Causes of defect formation and their identification in wall tiles	Sarvaš Ladislav, 984 01 Lučenec-Vidiná
PPC Insulators – Ceram Čab, a.s.	Properties of electroporcelain	Košalko Ivan, director, 951 24 Nové Sady
Tondach, s. s r.o. Stupava	Properties of roof silicate tiles	Horváth Vincent, Železničná 53, 900 31 Stupava
Východoslovenské stavebné hmoty, a.s., Turňa nad Bodvou (construction materials producer)	Milling ability of cement clinker and various additives	Jaklovský Štefan, director, 044 02 Turňa nad Bodvou
Holcim, a.s., Rohožník (Cement Producer)	Alternative fuels	Róbl Peter, director, 906 38 Rohožník
Považská cementáreň, a.s., Ladce (Cement Producer)	Determination of P <sub>2</sub> O <sub>5</sub> content in Portland clinker fired with addition of meat-bone flour, determination of water soluble chromium in ce	Martauz Pavol, director, ul. J. Kráľa, 018 63 Ladce
Beton Racio, s. s r.o., Trnava	Evaluation of water quality for concrete production	Halaša Igor, Skladová 2, 917 01 Trnava

OLO, a.s. Bratislava,	Condition optimization for CaO hydration	Švábik Vladimír, Vlčie hrdlo 72, 821 07 Bratislava
VUCHT, a.s. Bratislava (Research Institute of Chemical Technology)	Characterization of powder samples by SEM	Štrefancová Radka, Nobelova 34, 836 03 Bratislava
Stachema, s. s. r.o. Bratislava (building chemistry)	Physical and chemical properties of cements	Zajíček Milan, Nemčíkova 7, Bratislava

### B. International Cooperation

Institution	Type of cooperation	Responsible person
Mount Allison University, Department of Chemistry, Sackville, Canada	Growth, morphology and thermoanalytical properties of fluoroapatite bio-glass-ceramics in lithium disilicate glasses	Mojumdar Subhash C., Sackville, NB, E4L 1G8, Canada
University of Boumerdes, Faculty of Engineer Science, Department of Engineering Materials, Boumerdes	Silica fume treatment for improving durability of alkali resistant glass fibres in cement matrixes	Ayadi. Azzedine, professor, 350000 Boumerdes, Algeria
University of San Francisco, Department of Physics, San Francisco, USA	Crystal structure analysis of selected organic compounds, cooperation on deacidifying of cellulosic materials	Brandon G. Brown, professor, 2130 Fulton Street, San Francisco, CA 94117

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Department	Slovak Silicate Society, Bratislava	member	
Jamnický Miroslav	Slovak Glass Society, Lednické Rovne	member of advisory board	01.01.1997 - 01.12.2006
Department	Union of Glass Industry, Bratislava	member	
Palou Martin	Slovak Institute for Standardization (technical commission No 40 Inorganic binders)	member	01.01.2000 -
Smrčková Eva	Slovak Institute for Standardization (technical commission No 56 Construction materials and testing)	member	01.01.2000 -
Smrčková Eva	Association of Slovak Societies for Science and Technics	member of the board	01.06.2005 -
Lokaj Ján	Slovak Chemical Society	Member	01.01.2006 -
Jamnický Miroslav	Association of Slovak Societies for Science and Technics	member of the board	01.05.2006 -

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Lokaj Ján	Czechoslovak Crystallographic Society	member	01.01.1985 -
Kovár Vladimír	American Ceramic Society, USA	member	01.12.2005 -

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Rincón, J. M	The Eduardo Torroja Institute for Construction Science	Spain	October 2007 (1 day)



## F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Lokaj, J.	Jeol, seminary, Praha	Czech Republic	February 2007 (2 days)
Kuzielová, E.	Inorganic nonmetal materials, seminary, Praha	Czech Republic	February 2007 (3 days)
Lokaj, J.	University of California, San Francisco	USA	March - April 2007 (19 days)
Palou, M.	University of Pardubice, conference	Czech Republic	May - June 2007 (4 days)
Vítkovič, M.	Silichem 2007, conference, Brno	Czech Republic	September 2007 (3 days)
Palou, M.	20 <sup>th</sup> symposium on ceramics in medicine, Nantes	France	October 2007 (3 days)
Smrčková, E.	TA – theory and practice, seminary (Netzsch), Brno	Czech Republic	November 2007 (2 days)
Smrčková, E.	Binding materials 2007, conference, Brno	Czech Republic	December 2006 (1 day)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Mokrohajská, A.	Effect of new additives on concrete properties	Palou, M.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Bruder, P.	Possibilities of energy savings in a wet process cement plant	Kovár, V.
Habánek, J.	Application of conductive calorimetry to determination of heat effect and the kinetics of hydration of inorganic binding materials	Palou, M.
Vojtechovský, O.	Thermal processes during firing of ceramic wall and floor tiles	Smrčková, E.

## VIII. PUBLICATIONS

### Article in journal

- [1] KETTMANN, V., LOKAJ, J., MILATA, V., SALOŇ, J., ČEPAN, M., KOŽIŠEK, J.: 3-((2,3-diphenylquinoxalin-5-ylamino)methylene)pentane-2,4-dione. In: Acta Crystallographica Section E. – ISSN 1600-5368 – E63 (2007), p. o3005-o3006. (in English)
- [2] KUZIELOVÁ, E., PALOU, M. T., KOZÁNKOVÁ, J.: Crystallization mechanism and bioactivity of lithium disilicate glasses in relation to CaO, P<sub>2</sub>O<sub>5</sub>, CaF<sub>2</sub> addition. In: Ceramics – Silikáty. – ISSN 0862-5468 – 51-3 (2007), p. 136-141. (in English)
- [3] LOKAJ, J., KETTMANN, V., ČERNUCHOVÁ, P., MILATA, V., FRONC, M.: 3-Acetyl-4-aminoquinoline. In: Acta Crystallographica Section E. – ISSN 1600-5368 – E63 (2007), p. o1164-o1166. (in English)
- [4] LOKAJ, J., TURŇA, M.: Od optickej a elektrónovej mikroskopie k zobrazovaniu atómov (From optical and electron microscopy to visualisation of atoms). In: Strojárstvo – Strojirenství. – ISSN 1335-2938 – 11-2 (2007), p. 52-53. (in Slovak)
- [5] MARTUAZ, P., STRIGÁČ, J., JAMNICKÝ, M.: Decreasing chloride levels in cement rotary kiln atmosphere by sorption into hydroxyapatite structure. In: ZKG International. – ISSN 8133-82417 – 60-5 (2007), p. 75-86. (in English and German)

### Article in conference proceedings

- [1] BURY, P., HOCKICKO, P., JAMNICKÝ, I., JAMNICKÝ, M., SIDOR, P.: Transport and relaxation study of ionic glasses of the system

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- [15] THEISZOVÁ, M., JANTOVÁ, S., PALOU, M. T., REPICKÝ, A.: Cytotoxic evaluation of new fluor-hydroxyapatite composite on human fibroblast VH10 by direct contact. In: Zborník príspevkov XXIV. Xenobiochemické sympóziu, 22.-24.5.2007, Liptovský Ján. – ISBN 978-80-969688-5-5 – Ústav molekulárnej fyziológie a genetiky SAV Bratislava, p. 77 (in English)
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- [1] SMRČKOVÁ, E., JAKLOVSKÝ, Š., KÉPES, R.: Prísada na zníženie vodorozpustného chrómu Cr (VI) v cemente, spôsob jej výroby, cement alebo suchá omietková zmes s obsahom uvedenej prísady a spôsob jeho výroby (Additive for Decreasing of Water soluble Chromium Cr (VI) in Cement, its Production, Cement or dry cement facing Mixture with Content of named Additive and the Way of its Production). Vestník UPV SR zo 6. 12. 2007

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### Associate Professors:

Daniela Hudcová, PhD.; Soňa Jantová, PhD.; Mária Mikulášová, PhD.

### Assistant Professors :

Helena Paulíková, PhD.; Martin Šimkovič, PhD.; Andrea Šovčíková, PhD.; Silvia Letašiová, PhD.; Michal Kaliňák

### Research Fellows:

Boris Lakatoš, PhD.; Petra Olejníková; Barbora Kaliňáková

### PhD Students:

Eva Kadlečíková, Anita Kurucová, Andrej Repický, Monika Vaneková, Peter Vargovič, Zuzana Ondrušová, Lucia Birošová, Marica Theiszová, Bronislava Majerová, Lenka Krupková, Zuzana Vantová

### Technical staff:

Eva Drobná-Secretary; Eva Csenkeyová, Marta Fujáková, Ján Škvara

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Animal Cell Cultures  
Laboratory of Biochemistry of Cancer Cells  
Laboratory of Fungal Biochemistry and Physiology  
Laboratory of Immunochemistry  
Laboratory of Microbiology

### B. Research laboratories:

Laboratory of Animal Cell Cultures  
Laboratory of Biochemistry of Cancer Cells  
Laboratory of Molecular Biology and Genetics  
Laboratory of Radio-active Measurements  
Laboratory of Fungal Biochemistry and Physiology  
Laboratory of Immunochemistry  
Laboratory of Microbiology

## III. TEACHING

### A. Undergraduate Study:

<b>2. semester (Bc)</b>	Biology	2/0/0	Jantová
	Laboratory Practices in Biology	0/0/2	Letašiová, Kaliňák, Kaliňáková
<b>3. semester (Bc)</b>	Biochemistry I	2/0/0	Varečka
	Laboratory Practices in Biochemistry I	0/0/2	Paulíková, Šimkovič, Kaliňák, Vaneková, Kadlečíková, Vantová, Kurucová
	Microbiology I	2/0/0	Hudcová
	Laboratory Practices in Microbiology I	0/0/4	Birošová, Olejníková, Kaliňáková, Ondrušová, Krupková, Majerová

<b>4. semester (Bc)</b>	Study Program Project I	0/0/2	Varečka, Hudecová, Jantová, Mikulášová, Lakatoš, Letašiová, Olejníková, Birošová
<b>5. semester (Bc)</b>	Principles of Human Nutrition	2/0/0	Miko
	Biochemistry and Microbiology	2/2/0	Lakatoš, Hudecová
	Laboratory Practices in Biochemistry and Microbiology	2/0/0	Birošová, Olejníková, Lakatoš
	Study Program Project II	0/0/4	Varečka, Jantová, Paulíková, Šimkovič, Lakatoš, Letašiová, Olejníková, Kaliňáková, Krupková
	Microbiology	2/0/0	Hudecová
	Biochemistry	2/2/0	Varečka
	Molecular Biology and Genetics	2/1/0	Paulíková
<b>6. semester (Bc)</b>	Laboratory Project	0/0/9	Varečka, Hudecová, Jantová, Mikulášová, Šimkovič, Letašiová, Kaliňák, Kaliňáková, Olejníková
<b>1. semester (MSc)</b>	Biochemistry II	2/0/0	Varečka
	Laboratory Practices in Biochemistry II	0/0/2	Šimkovič, Kurucová, Vaneková, Kadlečíková
	Microbiology II	2/0/0	Hudecová
	Laboratory Practices in Microbiology II	0/0/2	Kaliňáková, Ondrušová
	Immunochemistry	2/1/2	Kaliňák, Letašiová
	Laboratory project I	0/0/5	Varečka, Hudecová, Jantová, Paulíková, Lakatoš, Kaliňáková, Olejníková
<b>2. semester (MSc)</b>	Molecular Biology and Genetics	2/1/0	Paulíková
	Applied Microbiology	2/0/0	Hudecová
	Bioenergetics	2/0/2	Miko
	Mechanisms of Action of Natural Compounds	2/0/2	Varečka, Šimkovič, Kaliňáková
	Laboratory project II	0/0/5	Hudecová, Jantová, Paulíková, Mikulášová, Olejníková
<b>3. semester (MSc)</b>	Clinical Biochemistry	2/0/0	Lakatoš
	Laboratory Practices in Clinical Biochemistry	0/0/2	Lakatoš, Šimkovič
	Cell Cultures	2/0/0	Jantová
	Laboratory Practices in Cell Cultures	0/0/2	Jantová, Letašiová
	Laboratory project III	0/0/5	Varečka, Hudecová, Jantová, Paulíková, Letašiová, Olejníková
	Lab. Practices of the branch Biomedical Engineering,...	0/0/2	Varečka, Hudecová, Jantová, Paulíková, Letašiová, Olejníková
<b>4. semester (MSc)</b>	Master's Thesis	0/0/27	Hudecová, Jantová, Paulíková, Lakatoš, Šimkovič

## IV. CURRENT RESEARCH PROJECTS

### **APVT Project No 20-003904 Biochemical and genetic aspects of senescence and cell death of filamentous fungi (Boris Lakatoš)**

The project concerns the question of senescence in filamentous fungi belonging to asexual fungi (Fungi imperfecti, deuteromycetes) in submerged and aerial culture. These fungi in aerial culture evade the senescence by activation of genetic program, which lead to formation of conidia (asexual spores). In submerged culture when a conidiation is considerably inhibited or in conditions preventing conidiation in aerial culture the mechanisms of senescence are activated. Together, filamentous fungi are a unique model in whom organisms young and aged cells are present at the same time. Experimental strategy, which should confirm existence of such mechanisms and to enable their analysis is a comparison of relevant biochemical, genetic and morphological changes in aerial and submerged cultures of selected microorganisms and their mutants defective in conidiation. In this study deuteromycetes *Trichoderma viride* and *Aspergillus nidulans* are selected as a experimental models.

Project duration: from 01.01.2005 to 31.12.2007

### **Vega Project No 1/2335/05 The role of proton-motive force in the Ca<sup>2+</sup> homeostasis in filamentous fungi (Martin Šimkovič)**

Ca<sup>2+</sup> homeostasis represents an integrating system of every living cell and plays a crucial role in the regulation of numerous functions on both cellular and organism levels. There is only scarce knowledge on the Ca<sup>2+</sup> homeostasis in filamentous fungi, which are scattered among several fungal species. Recently, we described properties of partial reactions of Ca<sup>2+</sup> homeostasis and their developmental changes in deuteromycete *Trichoderma viride*. We found that uncouplers stimulated both Ca<sup>2+</sup> influx and efflux across the cytoplasmic membrane. This means that the electrochemical potential of H<sup>+</sup> couples Ca<sup>2+</sup> translocation across this membrane. This observation is important for the understanding of Ca<sup>2+</sup> homeostasis and opens new views on the physiology of fungi and its intentional manipulation. This project is mainly devoted to the analysis of this phenomenon, to ascertaining its universality and/or specificity. A part of this project will be devoted to experiments, which could elucidate the role of Ca<sup>2+</sup> in the signaling pathway triggering the light-induced conidiation in *Trichoderma viride*.

Project duration: from 01.01.2005 to 31.12.2007

### **Vega Project No 1/3251/06 Úloha homeostázy H<sup>+</sup> pri adaptívnych odpovediach transportu živín vo vláknitých hubách (Ľudovít Varečka)**

We found earlier that the citrate and glutamate transport into Deuteromycete *Trichoderma viride* is only facultatively dependent on the proton-motive force (pmf) that is they become dependent upon the pmf only after their adaptation to the presence of these compounds. On the other hand, the uracil transport was constitutively dependent on the pmf. It is feasible that pmf is not a constant cellular parameter of filamentous fungi and its magnitude varies upon changes in external conditions. It is also feasible that the magnitude of pmf could be a subject of yet unknown cellular regulatory mechanisms. Furthermore, the response of filamentous fungi to the insufficient magnitude of pmf will be investigated. The goal of this project is to outline the role of pmf as driving force for the transport of selected nutrients and for the regulation of related metabolic pathways. Other goal is to understand mechanisms underlying the changes in pmf during the adaptation to non-saccharidic substrates and mechanisms used by fungi during the growth under conditions of low pmf.

Project duration: from 01.01.2006 to 31.12.2008

### **APVV project No LPP-0092-06 Pilotný program rozvoja experimentálnych schopností z biológie a chémie u stredoškolských študentov (Ľudovít Varečka)**

The aim of this project, which should be considered as a pilot project, is to create a set of experimental activities that could be realized on secondary school lessons and to provide the technical realisation on selected (partner) secondary schools. These activities will be chosen as to motivate students to study biochemistry, biotechnologies as well as areas relevant to medicine e.g. physiology, genetics, molecular biology and biomedical engineering

Project duration: from 01.10.2006 to 30.11.2008

**Ing. Silvia Letašiová, PhD. – Project 6RP/037019 (2006-2010) Health and Environmental Network (HENVINET). (Silvia Letašiová)**

To protect the health of populations and individuals, policies need to integrate environmental and health issues. The aim of HENVINET is to support such informed policy making. HENVINET will review, exploit and disseminate knowledge on environmental health issues based on research and practices, for wider use by relevant stakeholders. Further, it will lead to validation of tools and results with emphasis on the four priority health diseases of the European Environment and Health Action Plan (EHAP) 2004-2010, and will provide structured information overview that may be utilised by other actors relevant to Environment and Health Strategy.

Project duration: from 01.01.2006 to 31.12.2008

**VEGA Project No 1/4305/07 Study of cytotoxicity and the mode of action of novel xenobiotics (Soňa Jantová)**

The overall aim of the project is to develop the new potential anticancer drug. Therefore the cytotoxic and genotoxic properties of the compounds of four structural types will be evaluated. Special attention will be focused to determine the cell death way and the mechanism of the action of chosen most active derivatives of nitrogenous heterocycles, Cu<sup>++</sup> complexes and isothiocyanate (ITC); notably the interference with the glycolysis and respiration of EAC cells, the interference with the membranes, the cell cycle, their ability to induce apoptosis in different tumor cell lines. Modulation of glutathione metabolism can provide a strategy for more efficacious sensitization of tumour cells to standard anticancer drugs (ITC) in chemotherapy and anticancer activity of new modulators of glutathione relative enzyme will be investigated. The ability of quinolones to form singlet oxygen in the presence of UV irradiation and to induce phototoxic effect will be monitored. The next aim is the use of natural compounds for blockage, reversion and prevention of cancer. Therefore, the ability of phenolic phytochemicals to inhibit mutagenic activity of positive mutagens, their potential synergistic interactions and the relationship between the genetic origin, methods of isolation and their potential antimutagenic effect will be evaluated.

Project duration: from 01.01. 2007 to 31.12. 2009

## **VI. COOPERATION**

### **A. Cooperation in Slovakia**

<b>Institution</b>	<b>Type of cooperation</b>	<b>Responsible person</b>	<b>Duration</b>
Institute of Molecular Physiology and Genetics, SAS, Bratislava	Characterisation of basal Ca <sup>2+</sup> transport in non-excitabile cells	Dr. Albert Breier, Senior Research Scientist, Vlárská 5, 833 34 Bratislava	01.01.1990 -
Bicet, Biotechnological Centre SR, Bratislava	Improving existing infrastructure for genomics, proteomics and bioinformatics	Dr. Jaromír Pastorek, Director of IV SAS, Dúbravská cesta 9, 845 05 Bratislava	01.04.2003 -
Cancer Research Institute, SAS, Bratislava	Cytotoxicity of Novel Xenobiotics and Their mode of Action	Dr. Darina Slameňová, Head of Group, Vlárská 7, 833 91 Bratislava	01.01.1991 -
Tissue Bank, Hospital Ružinov, Bratislava	Cultivation and growth of human and animal tissue cultures on new biomaterials	Dr. Jana Dragúňová, Ružinovská 6, 826 06 Bratislava	01.01.1998 -
Dept. of Chem. Theory of Drugs, Fac. of Pharmacy, Comenius University, Bratislava	Study of antimicrobial activity of newly synthesized copper complexes	Dr. Aladár Valent, Associate professor, Kalinčiakova 8, 832 32 Bratislava	01.01.1999 -
Institute of Chemistry, Faculty of Science, PJŠU, Košice	New coordinating compounds of zinc, their preparation, study of physico-chemical properties and their biological activity (Joint grant)	Prof. Katarína Gyoryová, Full Professor, Moyzesova 11, 040 01 Košice	01.10.2001 -



## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Institute of cellular and molecular botany, Friedrich Wilhelms Universität, Bonn	Characterisation of microorganisms indigenous to low-rank coal, study of solubilisation of lignite by these microorganisms	Dr. Udo Hoelker, Head of group, Kirschallee 1, 53 115 Bonn, Germany	01.01.2001 -
Institut für Mikrobiologie, Universität zu Innsbruck	Membrane transport of organic acids in filamentous fungi (Joint grant)	Dr. Wolfgang Burgstaller, Head of Group, Technikerstrasse 25, 6020 Innsbruck, Austria	01.01 2002 -

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Miko Milan	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	
Miko Milan	Editorial board of journal Biológia	member	
Miko Milan	Editorial board of journal Acta fytotechnica et zootechnica	member	
Miko Milan	Commission for evaluation of DrSc (DSc) thesis in Biochemistry	member	
Hudecová Daniela	Czecho-Slovak Society for Microbiology, Bratislava	member	01.01.1984 -
Hudecová Daniela	Scientific grant agency (VEGA)– Commission for cell and molecular biology , Bratislava-	member	30.04.2002 -
Hudecová Daniela	Commission for evaluation of PhD thesis in Microbiology	secretary	20.10.1997 -
Jantová Soňa	Slovak Medical Society, Bratislava	member	01.01.1980 -
Jantová Soňa	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	01.01.2002 -
Jantová Soňa	Scientific grant agency (VEGA)– Commission for cell and molecular biology	member	30.04.2002 -
Mikulášová Mária	Czecho-Slovak Society for Microbiology, Bratislava	member	01.07.1992 -
Paulíková Helena	Slovak Toxicology Society	member	01.01.2005 -
Varečka Ľudovít	Editorial Board of journal General Physiology and Biophysics (GPB)	member	01.01.1993 -
Varečka Ľudovít	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member of advisory board	01.10.1996 -
Varečka Ľudovít	Scientific board of Institute of molecular physiology and genetics SAS, Bratislava	member	01.01.2001 -
Lakatoš Boris	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	01.01.2002 -
Andrea Šovčíková	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	01.01.2003 -
Martin Šimkovič	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	01.01.2002 -
Varečka Ľudovít	Commission for evaluation of DSc thesis in Biochemistry	member	01.10.2005 -
Birošová Lucia	Czecho-Slovak Society for Microbiology, Bratislava	member	01.01.2005 -
Kaliňáková Barbora	Czecho-Slovak Society for Microbiology, Bratislava	member	01.01.2006 -

Olejníková Petra	Czecho-Slovak Society for Microbiology, Bratislava	member	01.01.2006 -
Ondrušová Zuzana	Czecho-Slovak Society for Microbiology, Bratislava	member	01. 01. 2006 -
Letašiová Silvia	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	01.01.2006 -
Vargovič Peter	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	01.01.2006 -
Kaliňák Michal	Slovak Society for Biochemistry and Molecular Biology, Bratislava	member	01.01.2006 -

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Letašiová Silvia	EACR (European Association for Cancer Research)	member	01.01.2006
Letašiová Silvia	ESTIV (European Society of Toxicology in Vitro)	member	01.01.2006
Mikulášová Mária	Czecho-Slovak Society for Biology, Brno	member	01.01.1993 -

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Šimkovič, M.	University of Edinburgh	UK	May 7 - July 6, 2007
Vargovič, P.	Technion, Isreal Institute of Technology	Israel	May 8 - July 3, 2007
Letašiová, S.	6th World Congress on Alternatives and Animal Use in the Life Sciences	Japan	August 21-25, 2007
Birošová, L.	Power of microbes in industry and environment	Croatia	September 19-22, 2007
Olejníková, P.	Power of microbes in industry and environment	Croatia	September 19-22, 2007
Hudecová, D.	24th Symposium of Czechoslovak Society of Microbiology	Czech Republic	October 2-5, 2007

### VII. THESES AND DISSERTATIONS

#### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Frimmel, K.	Copper complexes as COX and LOX inhibitors	Kaliňáková, B.
Plavinová, V.	Essential oils and their antimicrobial effects	Mikulášová, M.
Matejov, P.	Study of effects of vanillin on formation of direct and reverse mutations	Mikulášová, M.
Nižňanský, Ľ.	The use of fluorescent probes for the study of metabolic pathways and membrane properties	Varečka, Ľ.
Vilimová, V.	Antibiotics as an effective tool for liquidation of pathogens	Hudecová, D.
Farkašová, L.	Alimentary infections of fungal origin	Hudecová, D.

Laubertová, L.	Inhibition of Human Leukemia HL-60 Cell Division by Plant Extracts Isolated from <i>Philadelphus Schrenkii</i>	Jantová, S.
Harnišová, E.	Cancer and nutrition	Letašiová, S.
Keltošová, S.	Available methods of assessing cell proliferation and viability (in vitro)	Theiszová, M.

## B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Fůžik, T.	Photochemical and Phototoxic Activity of the Selected Quinolone Derivatives	Jantová, S.
Hlaváčová, E.	New non-steroidal antiflogistics and their biological effects	Hudecová, D.
Ipóth, P.	The influence of cell culture conditions on alterations of selected proteins expression in breast carcinoma cell lines	Sedlák, J.
Janikovicsová, M.	Biological effect of new prepared derivatives of fluorenes	Jantová, S.
Krupková, L.	Biological activity of new fenamates with metal atom in the molecule	Hudecová, D.
Kunštek, M.	Quantitative aspects of molecular taxonomy of filamentous fungi	Šimkovič, M.
Machilová, K.	Anti-cancer of thiol conjugates of isothiocyanate E4-IB	Paulíková, H.
Podlesná, J.	Novel DNA binding acridite derivatives and their anticancer activity	Paulíková, H.
Slováková, J.	Basal influx of Ca <sup>2+</sup> into human leukocytes	Lakatoš, B.
Záhoranová, Ľ.	Ethyl-4-isothiocyanatobutanoate and its structural analogues: Cytotoxicity and reactivity towards thiols	Paulíková, H.

## C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Birošová, L.	Study of endogenous and exogenous factors effect on the development of mutations leading to ciprofloxacin resistance in <i>Salmonella enterica</i> subsp. <i>enterica</i> serotype Typhimurium	Mikulášová Mária
Theiszová, M.	Biological and biochemical characterization of the cells cultured on the different biomaterial class	Jantová Soňa

## VIII. PUBLICATIONS

### Parts of Books

- [1] Jantová S.: Chemické zlúčeniny s protinádorovu účinnosťou. In: *Život okolo nás očami chemika a biológa*. - : Vydavateľstvo STU v Bratislave. - ISBN 978-80-227-2707-5. - p. 87-97.
- [2] Jantová S.: Osmotické procesy v bunke. In: *Chémia a biológia v bežnom živote*. - ISBN 978-80-227-2706-8. - p. 48-53.

### Article in journal

- [1] Bajdichová, M., Paulíková, H., Jakubíková, J., Sabolová, D.: Comparison of inhibition of murine leukaemia cell growth by 9-isothiocyanatoacridine and its cytosine adduct: involvement of thiols. In: *Neoplasma*. - ISSN 0028-2685. - 54-6 (2007), p. 463-470.
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### PhD thesis

- [1] Birošová, Lucia: Štúdium endogénnych a exogénnych faktorov pôsobiacich na vznik mutácií vedúcich k rezistencii voči ciprofloxacínu pri kmeni *Salmonella enterica* subsp. *enterica* sérovar *Typhimurium*. FCHPT STU Bratislava, 2007. (Supervisor: Doc. RNDr. Mária Mikulášová, PhD.)
- [2] Theiszová, Marica: Biologická a biochemická charakterizácia buniek kultivovaných na rôznych typoch biomateriálov. FCHPT STU Bratislava, 2007. (Supervisor: Doc. Ing. Soňa Jantová, CSc.)

### Miscellaneous

- [1] Brtko, J., Hudecová, D., Ficková, M., Uher, M., Rondahl, L.: Selénové zlúčeniny derivátov kyseliny kójovej, spôsob ich prípravy a farmaceutický prostriedok, ktorý ich obsahuje : Patentový spis SK 285642 B6. - , 2007.

## DEPARTMENT OF NUTRITION AND FOOD ASSESSMENT

### Head of Department:

Assoc. Prof. Ľubomír Valík, PhD.

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## I. STAFF

### Emeritus Professors:

Alexander Pribela, Prof., DSc.

### Associate Professors:

Vladimír Frank, PhD.; Mária Takácsová, PhD.; Ľubomír Valík, PhD.; Ernest Šturdík, PhD.

### Assistant Professors :

Eva Hybenová, PhD; Mária Kováčová, PhD; Denisa Liptáková, PhD.

### Research Fellows:

Ladislav Dodok, Assoc. Prof., Bernadetta Hozová, PhD; Anna Mikulajová, PhD.; Lucia Brindzová MSc.

### PhD Students:

Lucia Brindzová, MSc.; Barbora Bajúsová, MSc.; Anna Chovancová, RNDr.; Alena Gajdošová, RNDr.; Katarína Mériová, MSc.; Petra Moravčíková, MSc., Barbora Vidová, RNDr., Zuzana Sulová, Ing., Jana Viskupičová, Mgr.; Alžbeta Medveďová, Ing.; Zuzana Petruláková, Ing.; Zuzana Šramková, Mgr., Anna Hudecová, MSc., Katarína Klačanová MSc., Silvia Mošovská, MSc., Lucia Mikušová MSc.

### Technical staff:

Edita Kovačičová; Gabriela Sisáková

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Food Microbiology and Hygiene  
Laboratory of Food Analysis and Assessment  
Laboratory of Sensorical Analysis

### B. Research laboratories:

Laboratory of Food Microbiology and Hygiene  
Laboratory of Food Analysis and Assessment  
Laboratory of Food Chemistry  
Laboratory of Nutrition and Health

## III. TEACHING

### A. Undergraduate Study:

<b>4. semester (Bc)</b>	Food Chemistry I.	(2 h)	Takácsová, Hybenová
<b>4. semester (Bc)</b>	Nutrition	(2 h)	Hybenová
<b>5. semester (Bc)</b>	Food Chemistry I.	(2 h)	Takácsová
	Bc. Project	(9 h)	All Department Staff
<b>5. semester (Bc)</b>	Food Analysis	(2 h)	Kováčová
	Laboratory of Food Analysis	(3 h)	Kováčová, Mikulajová, Liptáková, Hybenová, Petruláková, Brindzová, Medveďová, Moravčíková
<b>6. semester (Bc)</b>	Laboratory of Food Analysis	(4h)	Kováčová, Mikulajová, Liptáková, Hybenová, Petruláková, Brindzová, Medveďová, Moravčíková
<b>1. semester (MSc)</b>	Food Microbiology	(2 h)	Valík
	Laboratory of Food Microbiology	(3 h)	Valík, Liptáková, Bajúsová, Medveďová, Hudecová
	Food Additives and Contaminants	(2-0 h)	Hybenová
	Laboratory Practice Food Additives	(0-2 h)	Hybenová

	and Contaminants		
	Physiology and Pathophysiology of Human Nutrition	(2-2 h)	Kajaba
	Semestral Project I.	(0-5 h)	All Department Staff
	Laboratory of specialization		Hybenová, Fodran, Moravčíková
	Special Practice	(2-2 h)	Mikulajová
	Commodity Marketing	(2-2 h)	Lacková, Karkalíková
<b>2. semester (MSc)</b>	Food Hygiene	(2-1 h)	Valík
	Food Chemistry II.	(2 h)	Takácsová
	Diethology	(2 h)	Kajaba
	Semestral Project II.	(0-5 h)	All Department Staff
	Laboratory of Food Chemistry II	(1 h)	Takácsová
	Food Analysis II.	(2 h)	Prachár
	Special Training		Mikulajová
	Laboratory of Food Analysis II	(4 h)	Liptáková, Hybenová, Kováčová, Jakubík, Mikulajová, Brindzová
	Laboratory of Specialization	(0-4 h)	Fodran, Moravčíková
<b>3. semester (MSc)</b>	Food Additives and Contaminants	(0-2 h)	Hybenová
	Food Evaluation	(2 h)	Žúbor, Fodran
	Laboratory of Food Evaluation	(0-2 h)	Fodran, Liptáková, Žúbor
	Laboratory Practice Food Additives and Contaminants	(0-2 h)	Hybenová
	Semestral Project III.	(0-5 h)	All Department Staff
	Food Legislative	(2 h)	Šinková
	Industry production of ready-to eat meal	(2 h)	Mráz
<b>4. semester (MSc)</b>	Diploma Project	(0-27 h)	All Department staff

#### IV. CURRENT RESEARCH PROJECTS

##### **A. VEGA Project No 1/3488/06 Study, mathematical description and prediction of behaviour of technologically and hygienically relevant microflora in treated and original Slovak fermented food with the aim enhance their safety, functional properties and shelf-life (L. Valík)**

Microbial exposure assessment by selected heat-treated and cooled foods depending on storage temperature using predictive microbiology approach. Behaviour of micro-organisms during "time to consume" and microbial risk assessment connected with consumption of these foods. Selection and evaluation of lactic acid bacteria based on their growth parameters. Mathematical analysis of growth and relations among micro-organisms relevant from hygiene and technological point of view in raw, heat-treated and fermented dairy and bakery products. Enhancement of nutritive and dietetic properties of selected fermented dairy and bakery products with application of prebiotics and probiotics and their influence on hygienically undesirable micro-flora and shelf-life of the foods.

Project duration: from 2006 to 2008

##### **B. APVV Project No 20-005605 Safety and microbial originality of cheeses produced artisanally from raw milk- application of predictive microbiology and PCR methods in risk assessment (L. Valík)**

Mathematical analysis of the growth of lactic acid bacteria (LAB), supplement cultures and selected pathogenic micro-flora during fermentation and ripening of sheep lump cheese produced from raw milk. The principles of the predictive microbiology based on microbial responses to intrinsic and extrinsic environmental factors are applied. Effect of LAB, starter and supplement cultures producing substances with antimicrobial activity on the growth and multiplication of the pathogenic microflora is the main interest in our project.

Project duration: from 2006 to 2009

##### **C. VEGA Project No 1/9133/02" Development and control of new food technologies and application of biological active components into foods to increase their quality according to criteria used in EU" (A. Dandár, V. Frank)**

The growth of population leads to increased demands in food production with higher quality and durability. The modern trends in new food technologies are characterized with increased productivity, durability and nutritive



value of produced foods. This is closely connected with the development and optimization of basic physicochemical and biochemical processes used from raw material to final products. These trends are topical all over the world preferred by advanced national and multinational institutions. In our country there are demands mainly defined by EU. Proposed project builds on the research have been solved in the last years at our department to develop gained results.

Project duration: from 2005 to 2007

#### **D. AV Project No 4/0013/07 Monitoring, fractionation and using of cereals for industrial production of food products with health benefit properties (E. Šturdík)**

The first goal of this project is the monitoring and fractionation of health benefits substances in cereals. Upon the evaluation of analyses and the selection of the most suitable cereal species and varieties, these cereals and/or their fractions will be used to make foods for particular nutritional purposes (hereinafter the dietetic foods or parnuts) as a healthy human diet, with main emphasis being laid on their preventive and medicinal properties. Selective nutrients will be added to such foods in order to improve the qualitative properties of doughs and final bakery products, including the possibility of extending their life. The sensory and hygienic quality of newly proposed dietetic foods will be considered at the same time.

Project duration: from 2007 to 2009

### **V. CURRENT EDUCATION PROJECTS**

#### **A. Nutrition and health in training and education - M. Takáčsová; V. Frank**

Preparation of variable training and educational modules for various groups. Preparation of conceptual framework and subjects for whole-life education in nutrition, health and food safety in cooperation with the EAEA - European Association for the Education of Adults (<http://www.eaea.org/slovak/eaea.html>) and Institute of whole-life education at Slovak University of Technology (<http://www.stuba.sk/svk1/icv/slovak.html>). Establishing of the Educational centre STU in co-operation with College of Education of the Trnava University. Development of programmes for pre-school and school nutrition recommendations.

Project duration: from 2004 to 2006

#### **B. Project ESF No. (ITMS) 131 201 10055 "Preparation and realization of specialists in the field of human nutrition" (V. Frank)**

At the present time, it is generally accepted that in favour of health of human population it is necessary to focus our aim most of all on the field of prevention. It means to secure appropriate nutrition of population from point of view of various ages, physical and intellectual activity, profession and the like. In this direction it is inevitable to prepare needed specialists already at this time.

Project duration: from 2005 to 2007

#### **C. Project ESF No. (ITMS) 131 201 10100 "Training of enterprise skill for biotechnological industry" (E. Šturdík)**

The aim of the project is to prepare an excellent scientists from research, academic and other institutions for practical enterprising and to lead them into founding (establishing) of own firm.

Project duration: from 2006 to 2009

### **VI. COOPERATION**

#### **A. Cooperation in Slovakia**

<b>Institution</b>	<b>Type of cooperation</b>	<b>Responsible person</b>	<b>Duration</b>
Adivit Nitra	Experimental and consult. projects	E. Šturdík, E. Hybenová, M. Kováčová, L. Dodok, B. Hozová, Ľ. Valík	Since 2004

Pečivárne Liptovský Hrádok	Consultations	L. Dodok	Since 2004
Institute of Food Research, Bratislava	Consultation	Ľ. Valík	Since 2003
Agrifood , accredited testing laboratory s.r.o., Prievidza	Microbiological analysis	V. Frank	Since 1998
Research Institute of Plant Production Piešťany	Cooperation on governmental project "Quality, safety and functionality of primary food resources"	E. Šturdík	Since 2003
Food Chamber of Slovakia, Bratislava	Consultation	Ľ. Valík	Since 2004
Institute of Molecular Physiology and Genetics SA of Sci. Bratislava	Experimental project	E. Šturdík	Since 2004
Institute of Experimental Oncology SA of Sci. Bratislava	Experimental project	E. Šturdík	Since 2004
Institute of Hearth research SAV, Bratislava	Experimental project	E. Šturdík	Since 2004
Kombucha Slovakia, Batizovce	Experimental project	E. Šturdík, B. Hozová, Ľ. Kuniak, M. Kováčová	2006
Institute of Preventive and Clinical Medicine, Bratislava	Experimental project	E. Šturdík	Since 2004
Mlyn Sládkovičovo, a.s.	Experimental project	L. Dodok	Since 2005
Mlyn Pohronský Ruskov, a.s.	Experimental project	L. Dodok	Since 2005
Ireks Enzyma, s.r.o.	Consultations	L. Dodok	Since 2004
Podnikateľský zväz pekárov, cukrárov a cestovinárov, Bratislava	Consultations	L. Dodok	Since 2005
Cech pekárov a cukrárov, Bratislava	Consultations	L. Dodok	Since 2005
Institute of Experimental Pharmacology	Experimental project	E. Šturdík	Since 2005
SSPLPVV, Bratislava	Cooperation	A. Príbela	Since 2005
PMD Union, a.s., Bratislava	Consultations	L. Dodok	Since 2005
Research Institute of Drugs, Modra	Experimental and consultation project	E. Šturdík	Since 2005
Rajo, a.s., Bratislava	Consultations	Ľ. Valík	Since 1995

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Institute of Food Research Norwich, UK	Experiment consultations	Ľ. Valík	Since 1997
Czech University of Life Sciences, Prague	Consultations	D. Liptáková, Ľ. Valík	Since 2005
University of Chemical Technology, Prague	Consultations	D. Liptáková, Ľ. Valík	Since 2000
JCC Vienna	Consultations	L. Dodok	Since 1985

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
B. Hozová	Expert of the Slovak National Accreditation Service – Technical Commission TVA-L4	member	2000

E. Hybenová	Member of Committee of the Food Section SCHS	member	1999
V. Frank, B. Hozová	Slovak Chemical Society (SCHS)	member	1990
E. Hybenová	Slovak Society of Forestry, Agricultural, Food and Veterinary Sciences at Slovak Academy of Sciences	member	1998
Ľ. Valík	Member of the Editorial Board of the Journal of Food and Nutrition Research	member	2005
A. Mikulajova	Slovak Society of Forestry, Agricultural, Food and Veterinary Sciences at Slovak Academy of Sciences, Bratislava	member	2000
B. Hozová	Expert of the Deutsches Akkreditierungssystem Profwessen GMBH (DAP) for the microbiological food control	member	2000
V. Frank, E. Šturdík	Slovak Society of Forestry, Agricultural, Food and Veterinary Sciences at Slovak Academy of Sciences	member	1995
E. Šturdík	Scientific board of the Institute of Preventive and Clinical Medicine	member	2003
E. Šturdík	Scientific board of the Chemical Institute of the Slovak Academy of Science	member	2003
E. Šturdík	Academic board of the Slovak Nuclear Society	member	2003
E. Šturdík	Scientific board of the UCM University Trnava	member	2003
Ľ. Valík	Editorial Board of the Journal of Food and Nutrition Research	member	2006
M. Takáčsová	Editorial Board-Czech Journal of Food Sciences	member	2003
L. Dodok, M. Kováčová, B. Hozová, A. Príbela	Slovak Society of Forestry, Agricultural, Food and Veterinary Sciences at Slovak Academy of Sciences	member	1995
L. Dodok	SUTN Bratislava	member	1990
E. Šturdík	Editorial Board of the journal "Nutrition and Health"	chairmann	2002
E. Šturdík	Editorial Board of the journal "Nova Biotechnologica"	chairmann	2004
A. Príbela	Editorial Board of the Czech Journal of Food Science	member	2005
A. Príbela	Slovak Chemical Society	member	2005
A. Príbela	Editorial Board of the Bulletin of Food Research	member	2005
E. Šturdík	Scientific Board of the Research Institute of Plant Production	member	2005

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
B. Hozová, V. Frank, Ľ. Valík, D. Liptáková	Czechoslovak Society for Microbiology	member	

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Ľ. Valík	International Conference/Predictive modelling in Foods, Athenso	GR	September 2007/3days
D. Liptáková, B. Bajúsová	University of Chemical Technology, Prague	CZ	January 2007/2 days
Z. Sulová	National Center of Public Health Protection	BG	Since October 2005
Ľ. Valík, D. Liptáková, A. Medveďová	CS Microbiological Society/Kongress ČSSM 2007	CZ	October 2007/4 days
Ľ. Valík, D. Liptáková, A. Medveďová	CS Microbiological Society/Mikrobiologie potravin 2007	CZ	May 2007/3 days

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
L. Žemlička	Determination of phenolic acids in cereals using HPLC and GC-MS	L. Brindzová
D. Šedivá	Phytoestrogenic and antioxidant effects of soya isoflavones	M. Kováčová
V. Štrbová	Determination of beta-glucans in the cereals	B. Hozová
K. Munková	Extraction and identification of oat antioxidants and their effects on human health	L. Brindzová,
R. Monošík	Alteration of surface saccharides connected with expression of P-glycoprotein in mouse leukemic cells L1210	E. Šturdík
M. Kocková	Utilization of the lactic acid bacteria in bakery industry	E. Šturdík
D. Dubnický	Reactions of natural antioxidants and effect of cooking methods on total antioxidant activity of grain products.	L. Brindzová

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Hudecová Anna	Quantification of the effect of pH and lactic acid bacteria on the growth of selected contaminants isolated from the sheep cheese	D. Liptáková, L. Valík
Janovčíková Lenka	Dynamics of <i>Lactobacillus acidophilus</i> content in selected dairy products and its effect on hygienic relevant contaminants	D. Liptáková, L. Valík
Danielič Branislav	The influence of technology on beer flavour stability and its determination by modern physico-chemical methods	V. Brezová, M. Polovka
Findurová Katarína	The apple as the source of the phytochemicals for the functional foods	M. Kováčová
Gremeň Lukáš	The reconstitution of natural fruit aromas	P. Fodran
Klačanová Katarína	The reaction of amino acids in the coordination sphere of transition metals complexes	P. Fodran
Michalcová Martina	Effect of water activity and pH on growth of <i>Mucor circinelloides</i> from Bryndza cheese	L. Valík, E. Piecková
Mikušová Lucia	Antioxidants in cereals and their effect on human health	L. Brindzová
Mošovská Silvia	Methods for determination of natural antioxidants and their applications for selected nuts and oil seeds	L. Brindzová
Škultétyová Mária	The cocoa hulls as the potential source of the dietary fibre	M. Kováčová
Turzová Anna	Polyphenols in the cocoa hulls	M. Kováčová
Záborská Lenka	Improving stability of nut filling using cereal antioxidants	L. Brindzová

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Brindzová L.	Free radicals formation, prevention by natural oat antioxidants and their effect on human health	M. Takácsová
Z. Petuláková	Biotechnological production of cereal functional foods	E. Šturdík
A. Medveďová	Application quantitative and predictive microbiology in food safety	L. Valík
Minarovičová-Petriková J.	Quantitative analysis of mutual relationships among microorganisms in foods.	L. Valík
Bajúsová B.	Microbiology of selected fermented foods	L. Valík
Moravčíková P.	Development of physiology acceptable aroma components based on natural precursors	J. Šajbidor, P. Fodran
Gajdošová A.	Choice, evaluation and using of cereals for the preparation of functional food products with immunomodulating properties	B. Hozová
Vidová B.	Development of rapid diagnostic methods for detection of food microbial pathogens.	E. Šturdík
Kukurová I.	Interactions of antibiotics in milk in the determination of detection limits.	B. Hozová
G. Bertaová	PCR application in food microbiology	L. Valík
Viskupičová B.	Preventive and therapeutical aspects of flavonoid enzymatic transformation	E. Šturdík

Šramková Z.	Implementation of nutritive important genes into cereals	E. Šturdík
Kokindová M.	Isolation of natural extracts from herbs by supercritical fluid extraction	B. Simandi (H)
Mikulajová A.	Study of antioxidant properties and effect of cereals and pseudocereals on food stability.	M. Takáčsová
Mériová K.	Development of plant nutraceuticals for preventive medical purpose	E. Šturdík
Chovancová A.	Medical aspects of nutraceuticals	E. Šturdík
Hudecová A.	Quantification of the effects of intrinsic factors and mutual interactions among microorganisms in foods	Ľ. Valík, D. Liptáková
Klačanová K.	The production of natural flavours by destruction of natural precursors.	M. Takáčsová, P. Fodran
Mošovská S.	Antimicrobial and antimutagenic effects of pseudocereal extracts.	Ľ. Valík, L. Brindzová
Mikušová L.	Antioxidants in pseudocereals and their effect on human health.	M. Takáčsová, L. Brindzová

## VIII. PUBLICATIONS

### Article in journal

- [1] Dodok, L., Šturdík, E., Staruch, L.: Akrylamid v potravinách. In: Pekárstvo Cukrárstvo, Odborný časopis pekárskej a cukrárskej výroby na Slovensku. - ISSN 1335-6305. No 1, vol. 8 (2007), nestr. (in Slovak)
- [2] Dodok, L., Brindzová, L.: Rezistentný škrob-zdraviu prospešná zložka potravy. In: Pekárstvo Cukrárstvo, Odborný časopis pekárskej a cukrárskej výroby na Slovensku. - ISSN 1335-6305. No.1 vol. 8, (2007), pp. 8. (in Slovak)
- [3] Hozová, B., Kuniak, Ľ., Moravčíková, P., Gajdošová, A.: Determination of water-insoluble beta-D-glucan in the whole-grain cereals and pseudocereals. In: Czech Journal of Food Sciences. - ISSN 1212-1800. – no. 6 vol. 25, (2007), pp. 316-324. (in English)
- [4] Kováčová, M., Malinová, E.: Ferulic and Coumaric Acids, Total Phenolic Compounds and their Correlation in Selected oat Genotypes. In: Czech Journal of Food Sciences. - ISSN 1212-1800. No. 6 vol. 25, (2007), pp. 325-332. (in English)
- [5] Liptáková, D., Valík, Ľ., Lauková, A., Strompfová, V.: Characterisation of Lactobacillus rhamnosus VT1 and its effect on the growth of Candida maltosa YP1. In: Czech Journal of Food Sciences. - ISSN 1212-1800. No. 5 vol. 25, (2007), pp. 272-282. (in English)
- [6] Medvedová, A., Valík, Ľ., Bajúsová, B.: Kompetitívny/inhibičný potenciál zákovových kultúr voči Staphylococcus aureus pri spoločnej kultivácii v mlieku. In: Mliekarstvo. - ISSN 1210-3144. No. 3 vol. 38, (2007), pp. 26-30. (in Slovak)
- [7] Medvedová, A., Valík, Ľ., Bajúsová, B.: Kompetitívny účinok baktérií mliečného kysnutia na rast Staphylococcus aureus. In: Slovak Journal of Animal Science.-ISSN 1335-3686. No. 4 vol. -40, (2007), pp. 196-203. (in Slovak)
- [8] Mikulajová, A., Takáčsová, M., Alexy, P., Brindzová, L.: Optimalizácia extrakcie fenolových zložiek z pohánky na základe výsledkov plánovaného experimentu. In: Chemické listy. - ISSN 0009-2770. No.1 vol. 101, (2007), pp. 563-568. (in Slovak)
- [9] Mikulajová, A., Takáčsová, M., Rapta, P., Brindzová, L., Zalibera, M., Németh, K.: Total phenolic contents and antioxidant capacities of cereal and pseudocereal genotypes. In: Journal of Food and Nutrition Research. - ISSN 1336-8672. No.4 vol. 46, (2007), pp. 150-157. (in English)

### Article in conference proceedings

- [1] Bajúsová, B., Valík, Ľ., Liptáková, D., Medvedová, A.: Vplyv baktérií mliečného kysnutia na rast Staphylococcus aureus v mlieku : Výsledky prehľadok a sborník prednášok seminára. In: Celostátní přehlídka sýrů 2007. Výsledky prehľadok a sborník prednášok seminára Mléko a sýry 2007. - ISBN 978-80-7080-661-6. - pp. 95-98. (in Slovak)
- [2] Brindzová, L., Mikulášová, M., Mošovská, S., Oppatová, A., Rapta, P.: Antimutagenic activity of cereal extracts : Genetická toxikológia a prevencia rakoviny. In: Autumn Meeting Genetic Toxicology and Cancer Prevention, Jesenné pracovné dni Genetická toxikológia a prevencia rakoviny. - pp. 56. (in English)
- [3] Brindzová, L., Mikušová, L., Mikulajová, A., Takáčsová, M., Rapta, P., Čertík, M.: Antioxidačná a radikál zhašajúca aktivita cereálií a sledovanie ich vplyvu na zdravie človeka : Slovenská spoločnosť pre biochémiu a molekulárnu biológiu. In: Drobnicov memoriál 4. ročník. Zborník príspevkov. - ISBN 978-80-969755-3-2. - pp. 84-85. (in Slovak)
- [4] Brindzová, L., Mošovská, S., Mikulášová, M., Čertík, M.: Antioxidačné a antimutagénne účinky ovsia siateho : Slovenská spoločnosť pre biochémiu a molekulárnu biológiu. In: Drobnicov memoriál 4. ročník. Zborník príspevkov. - ISBN 978-80-969755-3-2. - pp. 118-119. (in Slovak)
- [5] Brindzová, L., Čertík, M., Rapta, P., Zalibera, M., Mikulajová, A., Takáčsová, M.: Antioxidant activity of oat varieties and their radical scavenging properties measured by EPR and UV/VIS assays. In: XXII International EPR Seminar. - ISBN 978-80-227-2658-0. - pp. 49-50. (in English)

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### Assistant Professors :

Helena Hronská, PhD; Lucia Sláviková

### Research Fellows:

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### PhD Students:

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### Technical staff:

Vlasta Sládková; Jaroslava Telgárska

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Bioanalytical Chemistry  
Laboratory of Biotechnology  
Laboratory of Fermentation Beverages  
Laboratory of Pharmaceutical Biotechnology  
Laboratory of Environmental Biotechnology  
Laboratory of Lipid Biotechnology

### B. Research laboratories:

Laboratory for the design of bioactive compounds  
Laboratory for biotechnological production of organic acids and fine chemicals  
Laboratory of microbial lipids and pigments  
Laboratory of secondary metabolites  
Laboratory of wine microbiology and oenology  
Laboratory of bioengineering  
Laboratory of solid state fermentations  
Laboratory for microbial degradation of xenobiotics  
Laboratory of brewing technology and ethanol production

## III. TEACHING

### B. Undergraduate Study:

1. semester (Bc)	Seminar of the Study Program	0/1/0	Šmogrovičová, Skokanová, Maruna, Krištofiková, Hanusová, Šulák
2. semester (Bc)	Biochemical and Biotechnological Information	1/1/0	Šmogrovičová, Cibíková, Gdovin, Kurejová, Šipőcz, Maruna
4. semester (Bc)	Fundamentals of Fermentation Technology	2/0/0	Rosenberg
	Food Biotechnology	2/0/0	Malík, Slugeň
	Terminal Work I	0/0/2	Šmogrovičová, Čertík, Dercová,

			Rosenberg, Šturdíková, Malík
<b>5. semester (Bc)</b>	Principles in Biotechnology	2/0/0	Šajbidor
	Bioanalytical Methods I	2/0/0	Šajbidor
	Laboratory in Bioanalytical Methods I	0/0/2	Čertík, Hronská, Hanusová, Lobpreis, Gdovin, Šipőcz
	Pharmaceutical Biotechnology I	2/0/0	Šturdíková
	Laboratory in Pharmaceutical Biotechnology I	0/0/2	Šturdíková, Maruna, Cibíková
	Terminal Work II	0/0/4	Čertík, Dercová, Hronská, Rebroš, Rosenberg, Šmogrovičová, Šturdíková
<b>6. semester (Bc)</b>	Terminal Work	0/0/4	Čertík, Dercová, Rosenberg, Malík
<b>1. semester (MSc)</b>	Enzymology and Enzyme Engineering	2/0/0	Hronská
	Laboratory in Enzymology and Enzyme Engineering	0/0/2	Hronská, Křišťofíková
	Information Systems and Data Processing	1/1/0	Šmogrovičová, Šulák, Nádaský
	Food Biotechnology	2/0/0	Slugeň
	Laboratory in Food Biotechnology	0/0/1	Křišťofíková, Slugeň
<b>1. semester (MSc)</b>	Bioanalytical Methods	2/0/0	Šajbidor
	Laboratory in Bioanalytical Methods	0/0/2	Čertík, Hronská, Hanusová, Lobpreis, Šipőcz
	Biosynthesis and Transformation of Metabolites	2/0/0	Rosenberg
	Laboratory in Biosynthesis and Transformation of Metabolites	0/0/1	Rosenberg
<b>1. semester (MSc)</b>	Terminal Work I	0/0/5	Čertík, Dercová, Rosenberg, Malík
<b>2. semester (MSc)</b>	Bioanalytical Methods	2/0/0	Šajbidor
	Laboratory in Bioanalytical Methods	0/0/2	Borodovčáková, Čertík, Garstková, Sláviková, Hronská
	Bioengineering	0/1/0	Slugeň
	Pharmaceutical Biotechnology	2/0/0	Šturdíková
<b>2. semester (MSc)</b>	Laboratory in Pharmaceutical Biotechnology	0/0/1	Šturdíková
	Technical Microbiology	2/0/0	Šturdík
<b>2. semester (MSc)</b>	Nutritional and Functional Properties of Food	2/0/0	Slugeň
	Modelling of biological processes	2/0/0	Slugeň
	Seminar of Modelling of biological processes	0/0/1	Slugeň
	Information Systems and Data Processing	1/1/0	Šmogrovičová, Skokanová
	Terminal Work II	0/0/5	Čertík, Dercová, Rosenberg, Šmogrovičová, Šturdíková
	Special Praxis		Čertík, Dercová, Rosenberg, Šmogrovičová, Šturdíková
<b>3. semester (MSc)</b>	Environmental Biotechnology	2/0/0	Dercová
	Laboratory in Environmental Biotechnology	0/0/2	Skokanová
	Malting and Brewing	2/0/0	Šmogrovičová
	Laboratory in Malting and Brewing	0/0/1	Terneni
	Chemistry and Microbiology of Wine	2/0/0	Malík
<b>3. semester (MSc)</b>	Laboratory in Chemistry and Microbiology of Wine	0/0/1	Furdíková
	Gene Manipulations	2/2/0	Čertík, Hanusová
	Special Laboratory Excercises	0/0/5	Čertík, Dercová, Rosenberg, Šmogrovičová, Šturdíková,
<b>4. semester (MSc)</b>	Diploma Work	0/0/27	Čertík, Dercová, Hronská, Rosenberg, Šturdíková, Šmogrovičová

## IV. CURRENT RESEARCH PROJECTS

### **A. VEGA Project No. 1/2390/05 Evaluation of agroindustrial materials using biotechnological means by application of microorganisms producing metabolites for food, agriculture, pharmacy and veterinary uses (Milan Čertík)**

The project is based on physiological regulation of microbial production of essentials polyunsaturated and conjugated fatty acids, squalene and sterol derivatives, organic acids (lactic acid), polyols (erythritol), ethanol, pigments (carotenoids, azaphilonic metabolites, mitorubrinic acid), polyketide metabolites and pharmaceutical using agroindustrial sources. Observations gained from parameter studies and optimisation of fermentation process provide useful information about aimed regulation of biochemical processes in fermentation technologies a thus they will create basis for link between basic and applied research that will have uses in both domestic and international research in this field. The project will result in proposals of equipments for experimental transfer from laboratory scale to semi-industrial scale. Fermentation preparation of these metabolites will contribute to expanding of their application in food, medical, pharmaceutical and veterinary practices.

Project duration: from 01.01.2005 to 31.12.2007

### **B. VEGA project No.1/2391/05 Fermentation processes, bio-ethanol production, microorganisms, immobilisation systems, wine, beer (Daniela Šmogrovičová)**

The aim of this project is to develop areas of biotechnology using fermentation processes with free and immobilized cells of microorganisms, for purpose of ethanol fermentation improvement in fermented beverages and bio-ethanol production. The focus will be on production of classical beverages fermentation productivity – traditionally fermented and special beer, different categories of wine and of fermented beverages with lowered content of alcohol and bio-ethanol production from renewable starch resources. Within the project possibility of "very high gravity" technologies – uses concentrated substrates – will be verified. An increase in gravity results in higher metabolic activity and increased ethanol production, but an effect of osmotic pressure and toxicity of produced ethanol affected cell viability. Since immobilised cells show various modifications in physiology and metabolic activity, biochemical composition and morphology, as well, an application of immobilised yeast can improve their ability to ferment concentrated substrates in dependence on carrier and technique used for immobilisation and protect the yeast cells against osmotic and ethanolic stress. Immobilisation also influence yeast by metabolites co-production and consequently flavour and character of fermented beverage. Systematical introduction of immobilization principle with continualisation of the processes should be driven to their practical application. Integration of up-to-date knowledge about yeast and bacteria metabolism should result into improvement of fermentation and production of alternative beverages, as well as bio-ethanol.

Project duration: from 01.01.2005 to 31.12.2007

### **C. VEGA Project No 1/4357/07 Bioremediation of soil contaminated by degradation products of the pesticides of the chlorophenols series: potential use of organomineral complex (OMC), humic acids, and zeolite (Katarína Dercová)**

The project has an ambition to bring new knowledge regarding the binding of organic contaminants of the chlorophenol series (predominantly pentachlorophenol - PCP) onto inorganic and organic parts of the tested sorbent – organomineral complex (OMC, produced by binding humic acids onto zeolite) and to study sorption abilities of humic acids isolated from different sources (e.g. lignite and oxyhumolite) for detoxification purposes in contaminated soil. The potential effect of humic acids on improvement of biodegradation will be studied as well. Immobilization processes observed in natural soil are of a great environmental importance as they may lead to a considerable reduction in the bioavailability and, as a result, of a toxicity of xenobiotics, e.g. pesticides or their degradation products. This may then lead to facilitation of biodegradation after a subsequent release of the bound chlorophenols due to the activity of microorganisms and decrease of pH (acid rains). Investigation of the effect of chlorophenols on microbial cells of the indigenous bacterial consortium or bioaugmented bacteria and ecotoxicity of soil will be also included in the project because presence of these compounds markedly influences biodegradation ability, survival, and colonization of microorganisms at their application in bioremediation technologies during decontamination.

Project duration: from 01.01.2007 to 31.12.2009

**D. VEGA Project No 11/4452/07 Development of new immobilized biooxidation systems based on hyperoxygenated whole cell / enzyme biocatalysts for novel white biotechnologies (Michal Rosenberg)**

The project has an ambition to bring new knowledge regarding the binding of organic contaminants of the chlorophenol series (predominantly pentachlorophenol - PCP) onto inorganic and organic parts of the tested sorbent – organomineral complex (OMC, produced by binding humic acids onto zeolite) and to study sorption abilities of humic acids isolated from different sources (e.g. lignite and oxyhumolite) for detoxification purposes in contaminated soil. The potential effect of humic acids on improvement of biodegradation will be studied as well. Immobilization processes observed in natural soil are of a great environmental importance as they may lead to a considerable reduction in the bioavailability and, as a result, of a toxicity of xenobiotics, e.g. pesticides or their degradation products. This may then lead to facilitation of biodegradation after a subsequent release of the bound chlorophenols due to the activity of microorganisms and decrease of pH (acid rains). Investigation of the effect of chlorophenols on microbial cells of the indigenous bacterial consortium or bioaugmented bacteria and ecotoxicity of soil will be also included in the project because presence of these compounds markedly influences biodegradation ability, survival, and colonization of microorganisms at their application in bioremediation technologies during decontamination.

Project duration: from 1.1.2007 to 31.12.2009

**E. National project 2004 ŠP 26 028 0C 05 The use of domestic materials and resources – Phytosterols and fatty acid derivatives (Milan Čertík, Michal Rosenberg)**

The aim of the project is focused on evaluation of co-products from rape seed oil and other industrial resources for technological preparation of phytosterols and fatty acid derivatives. The project is tended to optimization of isolation and purification processes for obtaining of phytosterols. The project will also solve the possible to prepare fatty acid derivatives for their use in food and pharmaceutical industry.

Project duration: from 01.07.2004 to 30.9.2007

**F. APVT project 99-005002 Influence of sugar beet on structure and bonding potential of paper. part: Modification and characterization of sugar beet (Michal Rosenberg)**

The project is coordinated by VUPC, a.s. Bratislava. Research will be focussed on exploitation of sugar beet pulp in paper industry as replacement of fibrous raw materials and additives for strength properties increase. Sugar beet pulp with optimal degree of accompanying compounds elimination and resulting in good development of fibre bonding surface will be prepared. The influence on refining (beating) process and degree of wire paper machine water pollution on transfer and strength properties of paper with addition of modified sugar beet pulp and cationic polymers to primary and recycled fibres will be evaluated

Project duration: from 1.5.2006 to 31.12.2008

**G. National project 2004 ŠP 26 028 0C 05 Complex evaluation of plant sources, part 1.4. Rare saccharides and complex valuation of beet slice (Michal Rosenberg)**

The project is coordinated by Research Institute of Food. Verification of methods used for preparation of L-arabinose from beet slice is the main aim of the project. The other sugars obtained from this process will be used as energy source for yeast biomass preparation with high content of trehalose. Purification methods for sugar preparation will be verify.

Project duration: from 01.01.2005 to 30.9.2007

**H. APVV Project No. 20-014105 Using the microorganisms living with the higher plants to alternative production of anticancer taxanes, phytochemicals of yew-tree Taxus sp. (Mária Šturdíková)**

Project is oriented to the investigation of anticancer compounds taxane family by prokaryotic Actinomycetes isolated from rhizoidal system and tissues of the higher plant Taxus. Verification of taxane production by Actinomycetes in conditions for alternative biosynthetic pathway of strains, there those is acknowledged production of these compounds by chemical analysis and by test with specific taxane antibodies. Optimization conditions for growth organism and stimulation of taxane biosynthesis, because microorganisms isolated from natural sources synthesize bioactive secondary metabolites as minorite metabolites. Study of effect of culture media composition, biotic and abiotic factors and specific inhibitors to reach the higher taxane products level in culture medium of isolated strain.

Project objectives: To find optimal conditions for biosynthesis and alternative biotechnological production of higher amounts of phytochemicals possessing anti-cancer activity using Actinomycetes isolated from host plant Taxus sp. as production microorganisms

Project duration: from 02.05.2006 to 31.12. 2008

### **I. APVV Project No. 0310-06 Study and development of functional foods. (Ján Šajbidor)**

Project is focused on study of bioactive compounds and possibility of their application into foods. The aim of the project is to obtain new scientific knowledge concerning the influence of various additives (mineral compounds as Ca, Zn, I, Mg, antioxidants, omega polyunsaturated fatty acids and  $\beta$ -1,3-D-glucon) on nutritive value from the view of food processing. The clinical testing and evaluation of healthy benefits of new fortified products are planned.

Project duration: from 08.02.2007 to 31.12.2009

## **V. CURRENT EDUCATION PROJECTS**

### **A. CEEPUS CII-HU-0023-01-0607, CII-HU-0023-02-0708 For the safe and healthy food and environment in Middle-Europe (Daniela Šmogrovičová)**

The activity of the CEEPUS-I network focused on the safety and quality aspects of horticultural and food production, as well as on agricultural ecology and landscape management. In these fields 13 partner institutions carried out extensive and effective exchange of students and teachers..

Project duration: from 01.09.2006 to 31.08.2008

### **B. Erasmus/Socrates - Agricultural University of Athens (Milan Čertík)**

The project deals mainly with educational and research activities between Faculty of Chemical and Food Technology SUT and Agricultural University of Athens. The work is focused on biotechnological utilization of renewable sources.

Project duration: from 01.09.2006 to 30.06.2007

### **C. Erasmus/Socrates - Faculty of Chemistry, Technical University Brno (Milan Čertík)**

The project deals mainly with educational and research activities between Faculty of Chemical and Food Technology SUT and Faculty of Chemistry, Technical University Brno. The work is focused on biotechnological production of pigments.

Project duration: from 01.09.2005 to 30.06.2008

### **D. Erasmus/Socrates - Graz University of Technology (Milan Čertík)**

The project deals mainly with educational and research activities between Faculty of Chemical and Food Technology SUT and Graz University of Technology. The work is focused on molecular study of lipid biosynthesis in yeasts.

Project duration: from 01.09.2005 to 30.06.2013

## **VI. COOPERATION**

### **A. Cooperation in Slovakia**

<b>Institution</b>	<b>Type of cooperation</b>	<b>Responsible person</b>	<b>Duration</b>
LIKO. Ltd. Bratislava	Biotransformation using bacteria Pseudomonas and Acetobacter.	Martin Minárik, director, Miletičova 23, Bratislava	01.03.2006 30.12.2007
Water Research Institute,	Contaminated sediments	Hucko Pavol, Nábr. L. Svobodu	01.01.2006 -

Bratislava		5, 812 49 Bratislava	31.12.2007
Water Research Institute, Bratislava	Ecotoxicity of chlorophenols	Tóthová Lívia, Nábr. L. Svobodu 5, 812 49 Bratislava	01.01.2006 - 31.12.2008
Water Research Institute, Bratislava	Passive sampling	Vrana Branislav, Nábr. L. Svobodu 5, 812 49 Bratislava	01.09.2006 - 31.12.2009
Soil Science and Conservation Research Institute	Sorption of pentachlorophenol on organomineral complex (zeolite and humic acids)	Makovníková Jarmila, Mládežnícka 36, 974 05 Banská Bystrica	01.01.2003 -
Soil Science and Conservation Research Institute	Biodegradation of PCP (pentachlorophenol) in different types of soils	Barančíková Gabriela, Reimannova 1, 080 01 Prešov	01.01.2003 -
Brno University of Technology	Use of humic acids for environmental purposes	Pekař Miloslav, Klučáková Martina, Purkyňova 118, Brno	01.09.2006-
Research Institute of Food, Bratislava	Enzymatic elimination of acrylamid from food	Ciesarová Zuzana, Priemyselná 4, 824 75 Bratislava	01.11.2006-
Institute of Chemistry, Slovak Academy of Sciences, Bratislava	Study of adaptation properties of pigment-forming yeasts	Breierová Emília, head of the Culture Collection of Yeasts, Dúbravská cesta 9, 842 38 Bratislava	01.09.2000 –
Institute of Chemistry, Slovak Academy of Sciences, Bratislava	Characterization and production of yeasts polysaccharides	Ema Paulovičová	01.09.2006 -
Research Institute of Plant Production, Piešťany	Quality, safety and functionality of primary food resources	Ján Kraic, director, Bratislavská cesta 122, 921 68 Piešťany	22.10.2003 –
LIKO. Ltd. Bratislava	Biotechnological production of carotenogenic pigments	Martin Minárik, director, Miletičova 23, Bratislava	01.01.2003 -
Institute of Animal Biochemistry and Genetics, Slovak Academy of Sciences	Lipid biosynthesis in yeasts	Ivan Hapala, director Moyzesova 61, 900 28 Ivanka pri Dunaji	01.01.2002 –
Institute of Animal Physiology, Slovak Academy of Sciences	Biosynthesis of conjugated linoleic acid by bacteria	Andrea Lauková, head of Research group, Šoltésovej 4-6, 040 01 Košice	01.01.2005 –
Institute of Animal Physiology, Slovak Academy of Sciences	Effect of microbial oils on rumen fermentation	Dušan Jalč, head of Research group, Šoltésovej 4-6, 040 01 Košice	01.01.2004 –
Club of Cystic Fibrosis, Košice	Lipid profile of cystic fibrosis patients	Gabriela Sabolová, head of dietetic group, Cesta pod Hradovou 13/A, 041 77 Košice	01.01.2004 –
hameln rds a.s. Modra	Cooperating organization. Evaluation of cytotoxic activity	Marta Múčková, Horná 36, 90001 Modra	01.01.1998 --
Institute of Molecular Biology SAV	Microbial genomic	Andrej Godány, head of research group Dúbravská cesta 21, 84551 Bratislava	01.09.2006 –
Pharmaceutical Faculty UK, Bratislava	Evaluation of biological activity of microbial products	Lýdia Bezáková, head of Department Kalinčiakova 8	1988
Villa Vino Rača, a.s., Bratislava	Isolation and characterisation of autochthonous yeasts	Ján Krampl Pri Vinohradoch 2 831 06 Bratislava	01.11. 2007 -

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Department of Pharmaceutical Sciences, North Dakota State University, Fargo, North Dakota, USA	Prediction of the fate of xenobiotics in the environment	Baláž Štefan, professor, Sudro Hall 108, Fargo, North Dakota, USA	01.01.1996-
School of Biological Sciences, University of Portsmouth, UK	Passive samplers – monitoring of organic contaminants	Graham Mills, Portsmouth, Hampshire, UK	01.02.2006 -
Microbiological Institute of	Isolation and	RNDr. Mária Brennerová, PhD.	01.12.2006-

Czech Academic of Sciences	identification of microorganisms from PCB-contaminated sediments	Vídeňská, Praha 4, Czech Republic	
Microbiological Institute of Czech Academic of Sciences	PCP-degradation products	Ing. Tomáš Cajthaml, PhD., Vídeňská, Praha 4, Czech Republic	01.04.2006 -
Department of Microbiology, Faculty of Sciences, University of Malaga, 29071 Malaga, Spain	The work is focused on probiotics of microbial population isolated from marine fishes.	Dr. Miguel Ángel Morinigo Gutiérrez, head of Department of Microbiology, Faculty of Sciences, University of Malaga, 29071 Malaga, Spain	01.02.2007 to 01.07.2007
Agricultural University of Athens, Athens, Greece	Biotechnological production of bioactive lipids from agro-industrial byproducts.	Seraphim Papanikolau, leader group, Department of Food Sciences and Technology, Athens, Greece	01.01.2005 – 31.12.2007
Institute of Biochemistry, Graz University of Technology, Austria	Lipid biosynthesis in yeasts	Guenther Daum, group leader, Petersgasse 12/2; A-8010 Graz, Austria	01.10.2005 -
LentiKats, a.s., Praha Czech Republic	Microbial production of bioethanol by immobilized microorganisms	Ing Radek Stloukal, PhD. Technical director, Praha, CR.	01.09.2006 - 31.12.2007
Office International de la Vigne et du Vin, Paris, France	Evaluation of wine	Dutruc-Rosset Georges, general director, 18, rue d'Aquesseau 75008 Paris, France	01.01.1983 –
Faculty of Chemistry, Technical University Brno, Czech Republic	Study of stress conditions on carotenogenic yeasts	Márová Ivana, Purkyňova 118, 61200 Brno, Czech Republic	01.01.2003 -
National Center for Agricultural Utilization Research, ARS, USDA, Peoria, Illinois, USA	Biotransformation of oils to value-added compounds	Ching Hou, Group leader Peoria, Illinois, USA	25.09.2004 -
Sonberk, a.s. , Brno Czech Republic	Isolation and characterisation of autochthonous yeasts	Olomoucká 40, 618 00 Brno	01.09.2006 –
Znovín Znojmo, a.s., Znojmo Czech Republic	Isolation and characterisation of autochthonous yeasts		01.09.2005 –
Catholic University of Louvain-la Neuve, Belgium	Biodegradation of polyaromatic hydrocarbons	Spiros Agathos, head of Department of Applied Chemistry and Bioindustries, Place Croix du Sud, 2/9-1348 Louvain, Belgium	01.02.2003 – 31.05.2006

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Čertík Milan	Slovak Society for Agriculture, Forestry, Food and Veterinary Sciences	Member	01.01.2001 -
Čertík Milan	Slovak Society for Biochemistry and Molecular Biology	Member	01.01.2005
Čertík Milan	Slovak Association of Industrial Biotechnology	Member	01.01.2006
Dercová Katarína	Czecho-Slovak Society for Microbiology	Member	01.01.1987
Dercová Katarína	National Scientific Council of the PCB- Non-Combustion Project SR 2006 /supported by UNIDO, UNDP, GEF/	Member	01.01.2006
Malík Fedor	Editorial board of journal Vinič a víno	Member	01.01.2001 -
Slugeň Dušan	Slovak Society for Agriculture, Forestry, Food and Veterinary Sciences	Member	01.01.1987 -
Slugeň Dušan	Editorial board of journal Vinič a víno	Member	01.01.2001 -
Šajbidor Ján	Slovak Society for Agriculture, Forestry, Food and Veterinary Sciences	Member	01.01.1987 -
Šajbidor Ján	Editorial board of journal Nutrition and Health	Member	01.01.2003
Šajbidor Ján	Editorial board of Journal of Food and Nutrition Research	Member	01.01.2005

Šajbidor Ján	National Committee – International Dairy Federation	Vice-president	01.06.2006
Šmogrovičová Daniela	Czecho-Slovak Society for Microbiology	Member	01.01.1979 -
Šturdíková Mária	Czecho-Slovak Society for Microbiology	Member	16.11.1988 -

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Čertík Milan	The American Oil Chemist's Society	Member	01.01.1994
Čertík Milan	The European Federation of Biotechnology	Member	24. 09.2003 -
Čertík Milan	The Society for Bioenergy and Biocatalysis	Member	06.12.2006 -
Dercová Katarína	IHSS (International Humic Substances Society)	Member	01.01.2006-
Dercová Katarína	IBBS (Int. Biodeterioration and Biodegradation Society)	Member	01.01.2006-
Dercová Katarína	EFB (European Federation of Biotechnology)	Member	01.01.2003-
Malík Fedor	Editorial boards of the journal Kvasný prům.	Member of advisory	01.01.1985 -
Malík Fedor	Editorial boards of journal Mitteilungen Klosterneuburg, Wien	Member	01.01.2003 -
Malík Fedor	FIJEV (Fédération Internationale des Journalistes et Ecrivains du Vin et Spiritueux)	Member	01.06.2007
Šajbidor Ján	Editorial board of Czech Journal of Food Science	Member	01.01.2006
Šajbidor Ján	ISEKI FOOD Association	Member of Steering Committee	01.03.2005
Šmogrovičová Daniela	European Brewing Convention Brewing Science Group	Member	01.12.1998 -
Šmogrovičová Daniela	Editorial boards of the journal Kvasný prům.	Member of advisory	01.01.1999 -

#### E. Visitors from Abroad

Name	Organisation or Institution	State	Date / Duration
Németh I.	Faculty of Food Technology J.J.Strossmayer University of Osijek	Croatia	14.05.2007– 16.06.2007
Greenwood Richard	University of Portsmouth, UK	UK	14.-16.01.2007
Mills Graham	University of Portsmouth, UK	UK	14.-16.01.2007
Daum Gunther	Institute of Biochemistry, Graz University of Technology	Austria	18.04.2007- 20.04.2007
Márová Ivana	Faculty of Chemistry, Technical University Brno	Czech Republic	02.06.2007- 08.06.2007
Miles Hember	Sagentia, Ltd.	United Kingdom	26.06.2007- 27.06.2007
Iciek Jan	Politechnika Lodzka	Poland	22.04.2007- 25.04.2007

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Čertík M.	Agricultural University of Athens, Athens	Greece	11.06.2007- 16.06.2007
Čertík M.	3 <sup>rd</sup> International Symposium on Biocatalysis and Biotechnology, Taichung	Taiwan	26.11.2007- 1.12.2007
Čertík M.	Ho-Chi-Minh City University of Technology, Ho-Chi-Minh City	Vietnam	2.12.2007- 5.12.2007
Čertík M.	King Mongkut's University of Technology Thonburi, Bangkok	Thailand	5.12.2007- 8.12.2007



Nádaský P.	Mendel University of Agriculture and Forestry Brno	Czech Republic	1.04.2007-30.04.2007
Nádaský P.	Wroclaw University of Environmental and Life Sciences, Faculty of Food Science	Poland	22.10.2007-22.11.2007
Rebroš, M.	University of Manchester	UK	1.1.2007-31.10.2007
Šmogrovičová D.	Warsaw Agricultural University	Poland	12.04.2007-21.04..2007
Šmogrovičová D.	22nd Brewing-Malting Conference Prague	Czech Republic	30.10.2007-2.11.2007
Šajbidor, J.	ISEKI_Food 2 - 2 <sup>nd</sup> Meeting, Valencia	Spain	28.02.2007-05.03.2007
Sajbidor, J	University of Victoria, Melbourne	Australia	07.09.2007-16.09.2007
Sajbidor, J	ISEKI_Food2 – 3 <sup>rd</sup> Meeting, Massy	France	25.11.2007-27.11.2007
Šulák M.	22nd Brewing-Malting Conference Prague	Czech Republic	30.10.2007-2.11.2007
Šulák M.	Graz University of Technology, Institute of Food Chemistry and -technology	Austria	1.03.2007-31.05.2007
Šulák M.	Graz University of Technology, Institute of Food Chemistry and -technology	Austria	1.09.2007-30.09.2007
Malík F.	Vinovita Zagreb, International Concours of Wine	Croatia	16.4.2007 – 20.4.2007
Malík F.	Concours Mondial Maastricht, International Concours of Wine	Netherland	28.4.2007 – 1.5.2007
Malík F.	Vino Ljubljana, International Concours of Wine	Slovenia	24.5.2007 – 28.5.2007
Malík F.	Mundus Vini Neustadt, International Concours of Wine	Germany	23.8.2007 – 27.8.2007
Malík F.	Terravino Eilat, International Concours of Wine	Israel	2.11.2007 – 8.11.2007
Dercová K.	Universidad Autonoma del Estado de Hidalgo (UAEH)	Mexico	3.- 10.11.2007
Dercová K.	Universidad Politécnica de Pachuca (UPP)	Mexico	3.-10.11.2007
Dercová K.	4th Biosorption and Biodegradation Symposium, Prague	Czech Republic	26.-30.08.2007
Dercová K.	Remediation Technologies X, Uherské Hradište	Czech Republic	22.-24.05.2007
Dercová K.	13th European Congress on Biotechnology, Barcelona	Spain	16.-19.09.2007
Skokanová M.	International Scientific Conference on Humic Acids in Ecosystems 7, Torun	Poland	17.-21.06.2007
Skokanová M.	Conference of Young Scientists “Tomaskovy dny”	Czech Republic	07.-08.06.2007
Lobpreis T.	School of Biological Sciences, University of Portsmouth	United Kingdom	5.2.-31.3.2007

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Bachratá Z.	New trends in monitoring of organic pollutants using passive sampling and determination of pollutant bioavailability	Dercová, K.
Dudinská D.	Study of antioxidant properties of red wines	Čertík, M.
Đurčanská K.	Isolation, selection and characterisation of pure cultures of wine yeasts	Malík, F.
Klempová T.	Genetically modified organisms as a tool for production of commercially important compounds	Čertík, M.
Lukáčová L.	Use of biological systems for soil ecotoxicity determination	Dercová, K.
Schenk Mayerová, A.	Usage of Immobilized Yeast for Organic Compounds Reduction	Rosenberg, M.
Tretinová B.	Characterisation of influence of pure culture of yeasts on aromatic profile of wine	Malík, F.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Bc. Adámková I.	Low-alcoholic beer production using genetically modified yeast	Šmogrovičová, D.
Bc. Baginová Z.	Application of humic acids at bioremediation of pentachlorophenol	Dercová, K.
Bc. Benešová C.	Carcinogenic acrylamid in food – enzymatic method of its elimination	Dercová, K.
Bc. Čechová Z.	Biodegradation of polychlorinated biphenyls (PCB) in contaminated soil	Dercová, K.
Bc. Eckertová K.	Study of genotype dependence of lipid profile of cereals	Čertík, M.
Bc. Gašparovičová J.	Biotechnological production of ethanol from D-xylose containing substrates	Rosenberg, M.
Bc. Habaj L.	Very high gravity fermentation vs. yeast performance	Šmogrovičová, D.
Bc. Hanusová V.	Regulation of carotenoid biosynthesis in selected yeasts	Čertík, M.
Bc. Havranová K.	Study of taxane products of epiphytic actinomycetes. Production, analysis, characterization	Šturdíková, M.
Bc. Sedlačková B.	The possibilities of industrial application of immobilized $\beta$ -galactosidase	Hronská, H.
Bc. Sojka Š.	Production of ethanol from whey by free and immobilized yeasts	Rosenberg, M.
Bc. Špaňová M.	Synthesis and storage of neutral lipids in yeasts	Čertík, M.
Bc. Terneni M.	The influence of yeast strain on composition and antioxidant activity of beer	Šmogrovičová, D.
Bc. Trejos Jimenez J.	Characterization of extracellular products of microorganisms isolated from fish microbiota against <i>Vibrio harveyi</i>	Šturdíková, M.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Valach, M.	Development of biosensors for monitoring of ethanol fermentation with using immobilized yeasts	Šturdík, E.

## VIII. PUBLICATIONS

### Chapter or pages in books

- [1]. Slugeň, D.: Bezpečné potraviny a zdravá výživa. In: Kariérne poradenstvo v oblasti prírodných vied v bratislavskom regióne, pp. 1-11, 2007.
- [2]. Šajbidor, J., Slugeň, D.: Cudzorodé a aditívne látky v potravinách - Ečka v potravinách. In: Život okolo nás očami chemika a biológa. Vydavateľstvo STU v Bratislave. ISBN 978-80-227-2707-5. pp. 42 – 46, 2007.

### Article in journals

- [1]. Cvenegrošová, M., Šmogrovičová, D.: Chmelové preparáty a faktory ovplyvňujúce priebeh chmelovaru. Chemické listy, 101(4), pp. 287-291, 2007.
- [2]. Čertík, M., Rapta, P., Brindzová, L., Vajcziková, I.: Antioxidačné vlastnosti červených vín račianskej oblasti - 2. Fenoly a resveratrol. Vinič a Víno, 7(5), pp. 113-115, 2007.
- [3]. Dercová, K., Sejáková, Z., Skokanová, M., Barančíková, G., Makovníková, J.: Bioremediation of soil contaminated with pentachlorophenol (PCP) using humic acids bound on zeolite. Chemosphere, 66 ( 5), pp. 783-790, 2007.
- [4]. Dercová, K., Sejáková, Z., Skokanová, M., Barančíková, G., Makovníková, J.: Využitie organo-minerálneho komplexu pri bioremediácii kontaminovaných pôd. Chemické listy, 101 (10), pp. 767-870, 2007.
- [5]. Firáková, S., Šturdíková, M., Múčková, M.: Bioactive secondary metabolites produced by microorganisms associated with plants. Biológia, Bratislava, Section Botany, 62 (3), pp. 251-257, 2007.
- [6]. Furdíková, K., Malík, F.: Arabská guma a víno. Vinič a víno, 4, pp. 86-87, 2007.
- [7]. Furdíková, K., Malík, F.: Dusík vs. fermentácia hroznového muštu. Vinařský obzor, 11, pp. 546-548, 2007.
- [8]. Furdíková, K., Malík, F.: Kolobeh síry vo víne. Vinařský obzor, 7, pp. 370-373, 2007.
- [9]. Furdíková, K., Malík, F.: Kvasinky vo vinárstve. Vinařský obzor, 10, pp. 488-489, 2007.
- [10]. Furdíková, K., Malík, F.: Vplyv kvasiniek na aromatický profil vína. Kvasný průmysl, 7-8, pp. 215-221, 2007.
- [11]. Furdíková, K., Malík, F.: Vplyv kvasiniek na aromatický profil vína. Časť 1., Vinič a víno, 3, pp. 61-63, 2007.
- [12]. Furdíková, K., Malík, F.: Vplyv kvasiniek na aromatický profil vína. Časť 2., Vinič a víno, 4, pp. 83 – príloha 1, 2007.
- [13]. Furdíková, K., Malík, F.: Vplyv kvasiniek na chuť vína - Časť 1. Vinič a víno, 5, pp. 109-111, 2007.
- [14]. Furdíková, K., Malík, F.: Vplyv kvasiniek na chuť vína - Časť 2. Vinič a víno, 6, pp. 133-135, 2007.
- [15]. Furdíková, K., Malík, F.: Vplyv kvasiniek na senzorický profil vína 1. časť - Úvod. Vinič a víno, 1, p. 12 - príloha1, 2007.
- [16]. Furdíková, K., Malík, F.: Vplyv kvasiniek na vzhľad vína. Vinič a víno, 2, príloha 12 - p. 37, 2007.
- [17]. Jalč, D., Čertík, M., Kundříková, K., Náměstková, P.: Effect of unsaturated C18 fatty acids (oleic, linoleic and  $\alpha$ -linolenic acids) on ruminal fermentation and production of fatty acids isomers in an artificial rumen. Veterinary Medicine, 52(3), pp. 87-94, 2007.
- [18]. Juraščík, M., Sikula, I., Rosenberg, M., Markoš, J.: Measurement of mass transfer coefficients in airlift reactors with internal loop using the glucose oxidase method. Chemical and Biochemical Engineering Quarterly 21(3), pp. 207-212, 2007.
- [19]. Lobpreis, T.: Problematika monitorovania organických kontaminantov vo vodnom prostredí a porovnanie s pasívnym vzorkovaním, 1. časť. Odpady, 7-6, pp. 30-32, 2007.
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- [22]. Malík, F.: 100 najlepších slovenských vín. ISBN 978-80-89218-55-4. Albert Marenčin, Vydavateľstvo PT. p. 184, 2007.
- [23]. Malík, F.: Kolem světa za vínem. ISBN 80-86986-30-6. Vydavatelství May Day Pardubice. p. 240, 2007.
- [24]. Rapta, P., Čertík, M., Brezová, V., Vajcziková, I.: Meranie antioxidačných vlastností červených vín račianskeho regiónu. 1. EPR spektroskopía. Vinič a Víno, 7(3), pp. 67-69, 2007.
- [25]. Rebroš, M., Rosenberg, M., Mlichová, Z., Krištofiková, L.: Hydrolysis of sucrose by invertase entrapped in polyvinyl alcohol hydrogel capsules. Food Chemistry, 102, pp. 784-787, 2007.

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## II. TEACHING AND RESEARCH LABORATORIES

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Laboratory Practice of Dairy Technology I., II  
Laboratory of the Specialization I., II  
Laboratory Practice of Fats, Detergents and Oleochemistry  
Laboratory of PC Application in Food Industry  
Laboratory of Cosmetology

### B. Research laboratories:

Laboratory of Sugar Technology  
Laboratory of Starch, Confectionary Chemistry and Technology  
Laboratory of Cereal Technology  
Laboratory of Canned Products  
Laboratory of Meat and Meat Products  
Laboratory of Food Preservation  
Laboratory of Fats and Detergents and Oleochemistry  
Laboratory of Milk Chemistry and Technology  
Laboratory of Cosmetology

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Hygiene and Health Protection	2/0/0	Hojerová
	Seminary of Study Program	0/1/0	Schmidt
<b>2. semester (Bc)</b>	Information Technologies in Food Industry	1/1/0	Sekretár
<b>4. semester (Bc)</b>	Food and Biotechnological Raw Materials	2/0/0	Karovičová
	Project of Study Program I	0/0/4	Schmidt
<b>5. semester (Bc)</b>	Fundamentals of Food Technology	2/0/0	Karovičová
	Project of Study Program II	0/0/3	All members of the staff
	Packaging and Distribution of Foods	2/0/0	Schmidt, Sekretár
<b>6. semester (Bc)</b>	Food Safety	2/0/0	Hojerová
	Food Engineering	2/2/0	Schmidt



	Terminal Work	0/0/9	All members of the staff
	Fats and Oleochemistry	1/1/0	Schmidt, Sekretár
	Packaging and Packaging Materials	1/1/0	Sekretár
	Cosmetic and Household Chemistry	1/1/0	Hojerová
<b>1. semester (MSc)</b>	Food Engineering	2/0/1	Schmidt
	Chemistry and Technol. of Sacharides	2/0/2	Minarovičová
	Theory of Food Preservation	3/0/1	Greif
	Dairy Technology I.	2/0/0	Greifová,
	Semester Project I.	0/0/5	All members of the staff
	Laboratory Practice of Dairy Technology I.	0/0/2	Greifová, Krajčová
<b>2. semester (MSc)</b>	Cereal Chemistry and Technology	4/0/1	Kohajdová
	Sugar technology	4/0/0	Dandár
	Laboratory of the Specialization I.	0/0/4	Kohajdová, Minarovičová
	Preserved and Frozen Food Technology	2/0/1	Karovičová, Greif
	Meat and Poultry Technology I.	2/0/1	Staruch
	Raw Materials for Canning Industry	2/0/0	Karovičová, Staruch
	Laboratory of the Specialization I.	0/0/4	Staruch, Karovičová, Greif
	Fats, Detergents and Oleochemistry	4/0/0	Schmidt, Sekretár
	Laboratory Practice of Fats, Detergents and Oleochemistry	0/0/3	Sekretár, Schmidt, Záhradníková
	Dairy Technology II.	2/0/0	Greifová, Mastihuba
	Laboratory Practice of Dairy Technology II.	0/0/3	Krajčová, Greifová
	Microbiology of Milk, Fats and Cosmetics	1/0/0	Greifová
	Semester Project II.	0/0/5	All members of the staff
<b>3. semester (MSc)</b>	Chemical Engineering Processes in Sugar Technology	2/0/0	Dandár
	Technology Optimising in Canning Industry	1/0/1	Greif
	Laboratory of the Specialization II.	0/0/4	Staruch, Karovičová
	Semester Project III.	0/0/5	All members of the staff
	Chemistry and Technology of Cosmetics	2/0/2	Hojerová, Boreková
	Laboratory Practice of Microbiology of Milk, Fats and Cosmetics	0/0/2	Greifová, Krajčová
	Laboratory of the Specialization II.	0/0/4	Minarovičová
	Meat and Poultry Technology II.	2/0/0	Staruch
	Laboratory of Meat and Poultry Technology II.	0/0/2	Staruch
	By-products in Food Industry	2/0/0	Augustín
	Laboratory of By- products in Food Ind.	0/0/2	Augustín
	PC Application in Food Industry	2/0/0	Sekretár
	Laboratory of PC Application in Food Industry	0/0/2	Sekretár
	Technology Optimising in Sugar Industry	2/0/0	Dandár
	Laboratory Practice of Technology Optimising in Sugar Industry	0/0/2	Dandár
<b>4. semester (MSc)</b>	Diploma Work	0/0/27	All members of the staff

#### IV. CURRENT RESEARCH PROJECTS

##### A. VEGA Project No 1/2392/05 Methods for control of quality of food and health care products (Š.Schmidt)

The project proposes development and innovation of methods for control of quality and safety of food and health care products via controlling their chemical, physical and microbiological changes during production, storage and distribution to consumer as well as development and validation of analytical methods for this purpose. Special focus will be taken on oxidative changes of fat products, use of selected starter cultures possessing antimicrobial activity in production of fermented dairy and meat products, use of biosensors in assessment and authentication

of food, development and validation of alternative methods for assessment of cosmetic products, study of rheology of hydrocolloids and preparation of alternative food and cosmetic additives with new functional properties or produced by procedures friendly to the environment.

*Project duration:* from 01.01.2005 to 31.12.2007

**B. VEGA Project No 1/9133/02 Development and control of new food technologies and application of biological active components into foods to increase their quality according to criteria used in EU (Alexander Dandár)**

The growth of population leads to increased demands in food production with higher quality and durability. The modern trends in new food technologies are characterized with increased productivity, durability and nutritive value of produced foods. This is closely connected with the development and optimization of basic physicochemical and biochemical processes used from raw material to final products. These trends are topical all over the world preferred by advanced national and multinational institutions. In our country there are demands mainly defined by EU. Proposed project builds on the research have been solved in the last years at our department to develop gained results.

The main goals of the project are:

- 1/ development and modification of progressive technological procedures in utilization of cereals and non-traditional pseudocereals (amaranth)
- 2/ application of natural substances to improve the food quality; i.e. natural antioxidants, stabilisers and substances with preventive effect on humans.
- 3/ utilization of microelements and other biologic important substances in raw materials and final products.
- 4/ using of lactic fermentation as a conservation method to produce semi- and final products.
- 5/ application of new liming agents without toxic compounds. Study of colorants formation and their elimination to improve sugar quality.

*Project duration:* from 01.01.2005 to 31.12.2007

**C. VEGA Project No. 1/3546/06 Monitoring and prevention of creation of biogenic amines to ensure food quality and safety ( Karovičová Jolana)**

Monitoring of occurrence of biogenic amines in plant and animal foods. Study of effect of model conditions (temperature, pH, content of NaCl, NaNO<sub>3</sub> and preservatives) on the growth and production of biogenic amines by both contaminating bacteria and starter cultures. Evaluation of inhibition effect of probiotic bacteria and starter cultures on contaminants originating from raw materials (estimation of biogenic amines and organic acids). Selection of starter cultures and bacteria employed in dairy and meat technology characterised by production of bacteriocins and/or low production of biogenic amines. Use of multistatistic variation methods for evaluation of microbiological and chemical analyses for prediction of occurrence of biogenic amines and behaviour of microorganisms in model conditions and in food products.

*Project duration:* from 01.01.2005 to 31.12.2007

**D. KEGA Project No. 3/3019/05 Education of Secondary School Teachers of Chemistry and Biology Oriented to Solve Problem Tasks of Daily Life and New Trends in Chemistry and Biology. ( Pavel Kovařík )**

Acquaintance of Secondary School Teachers with New Information in Chemistry and Biology, with New Forms in Chemistry and Biology Teaching – Teaching by Solving Problem Tasks, e-Learning and Exploitation Multimedia Means.

**Cooperator: Jarmila Hojerová**

*Project duration:* from 01.01.2005 to 31.12.2007

**E. Project APVV-51-0179 05 Molecular mechanisms of action of new drugs interfering with oxidative stress – the important factor in etiopathogenesis of numerous diseases“.(/Doc. MUDr. Svorad Štolc, DrSc., Institute of Experimental Pharmacology, SAS Bratislava.), Cooperators: Hojerová, Boreková**

Explanation of molecular mechanism´ effects of selected antioxidants and free radical scavengers in the determined conditions. In our stages are searched the effective transdermal vehicles for delivery antioxidants and free radical scavengers and their prophylactic effects against oxidative stress on the topical applications.

*Project duration:* from 01.01.2005 to 31.12.2007

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Ministry of Agriculture of Slovak Republic, Bratislava	Consultations, Grant No. 524 and 526 (13a and 13b)	Karovičová,J., Schmidt,Š.	continue
Food Research Institute, Bratislava	Consultation	Dandár, A., Karovičová, J.	continue
Food Research Institute, Bratislava	Member of Editorial Board of Food and Nutrition Research.	Schmidt,Š.	continue
Department of Preventive and Clinical Medicine	Consultation	Dandár, A.	continue
TAURIS, Rimavská Sobota	Development and Innovation of Meat Products	Staruch,L.	continue
EDAS, s.r.o., Bratislava	Education Co-operation	Hojerová,J.	continue
Institute of Experimental Pharmacology, SAS Bratislava	Research Co-operation	Hojerová,J.	continue
Palma-Henkel, Co. N.Mesto nad Váhom	Educational process	Schmidt,Š., Sekretár,S.	continue
Palma-Tumys, Bratislava	Educational process	Schmidt, Š., Sekretár,S.	continue
Institute of Dairy Research, Žilina	Consultation; Development of improved control of food safety for industry	Greifová,M., Greif,G.	continue
Slovak Society of Cosmetology, Bratislava	Cooperation at the scientific conferences	Hojerová,J.	continue
Slovak Sugar Society	Consultation about sugar technology	Dandár, A.	continue
NIKA, Považská Bystrica	Consultation	Greifová,M.	continue
Liptov Dairy Factory	Consultation	Greifová,M.	continue
Dairy Factory in Levice	Consultation	Greifová,M.	continue
De Miclén, Co, Levice	Consultation of cosmetics quality and safety	Hojerová,J.	continue
Q-CHEM, Modra	Modification of Saccharides	Bilaničová, D.	2003-
Brenntag Slovakia s.r.o., Pezinok	Consultation	Hojerová,J.	continue
Zentiva, Co., Hlohovec	Educational process	Hojerová,J.	2005 -
Finecon, Bratislava	Consultation	Hojerová,J.	continue

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Department of Saccharide's Technology, Prague	Publications	Dandár, A.	continue
Institute of Chemical Technology, Dep. Of Dairy and Fat Technology, Prague	Natural antioxidants	Schmidt,Š., Greifová,M., Sekretár,S.	continue
Milcom – Dairy Research Institute, Prague	Development of improved control of food safety for industry	Greifová,M.	continue
Institute of Food Research, Manchester, UK	Research of Antioxidants	Schmidt,Š., Sekretár,S.	continue
Akademia Rolnicza, Krakow, Poland	Clarification agents in sugar industry	Dandár,A., Minarovičová,L.	continue
Zuckerforschungsinstitut Tulln, Austria	Problems in sugar industry	Dandár,A.	continue

Technical University Lodž, Poland	Microbial activity during sucrose extraction	Dandár,A.	continue
Research Institute of Sugar Technology, Prague	Member of Editorial Board of Sugar Papers	Dandár,A.	continue
Technical University, Berlin	Problems in sugar industry, publications	Dandár,A.	continue
International Federation of Cosmetic Chemists, UK	Cooperation, Publications	Hojerová, J.	continue
Czech Society of Cosmetology, Prague, Czech Republic	Cooperation	Hojerová, J.	continue
Institute of Hydrodynamic, Academy of Science of Czech Republic, Prague	Development of rheology of food and cosmetic materials and products	Hojerová, J.	continue
SA.FO.SA S.p.A., Italy	Research and Education Co-operation	Hojerová, J.	continue

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Schmidt,Š.	Slovak Chemical Society	Member	Since 1995-
Schmidt,Š.	Editorial Board of J.of Food and Nutrition Research	Member	Since 1989-
Schmidt,Š.	Committee of the Slovak Chemical Society	member	Since 1990-
Schmidt,Š.	Grant Agency of ME SR and SAS, editorial board VEGA No. 10	Member	continue
Staruch,L.	Slovak Soc. Of Agricultural, FORESTRY, food and Veterinary Sci., Bratislava	Member	Since 1990-
Staruch,L.	Foundation SLOVAK GOLD, Bratislava	Member	continue
Staruch,L.	The Union of Slovak Butchers	Member	Since 1994-
Staruch,L.	Slovak Institute of Technical Normalization, Bratislava	Member	Since 2003-
Staruch,L.	Food Processing, Development and Food Products	Judge expert	Since 1999-
Staruch,L.	Committee DANUBIUS GASTRO	Member	Since 2003-
Augustín,J.	Slovak Soc. Of Agricultural, FORESTRY, food and Veterinary Sci., Bratislava	Member	Since 1985-
Karovičová, J.	Slovak Soc. Of Agricultural, FORESTRY, food and Veterinary Sci., Bratislava	Member	Since 1985-
Kohajdová, Z.	Slovak Soc. Of Agricultural, FORESTRY, food and Veterinary Sci., Bratislava	Member	Since 2000-
Minarovičová, L.	Slovak Soc. Of Agricultural, FORESTRY, food and Veterinary Sci., Bratislava	Member	Since 2002-
Minarovičová, L.	Slovak Chemical Society	Member	Since 2007-
Zahradníková, L.	Slovak Chemical Society	Member	Since 2007-
Zufarov, O.	Slovak Chemical Society	Member	Since 2007-
Krajčová, E.	Slovak Chemical Society	Member	Since 2007-
Jancurová, M.	Slovak Soc. Of Agricultural, FORESTRY, food and Veterinary Sci., Bratislava	Member	Since 2005-
Hojerová,J.	Commission for Technical Standards No 79, Slovak Institute for Technical Standards	Member	continue
Hojerová,J.	Editorial board of DERMA	Member	continue
Hojerová,J.	Editorial board of DERMA Revue	Member	continue
Greifová,M.	Slovak Chemical Society	Member	Since 1999-
Greifová,M.	Scientific board of VÚM, Žilina	Member	Since 2003-

Dandár,A.	Slovak Soc. Of Agricultural, FORESTRY, food and Veterinary Sci., Bratislava	President	continue
Dandár,A.	Slovak Academy of Agricultural Sci., Bratislava	Member	continue
Dandár,A.	Slovak Academy of Technical Sciences, Bratislava	Member	continue
Dandár,A.	ICUMSA, Slovak National Committee	Chairman	Since 1980-
Dandár,A.	Slovak Agricultural Academy, Nitra	Member	Since 1992-
Dandár,A.	SAPV, specialization of Food	Vice-president	continue
Hojerová,J.	Foundation SLOVAK GOLD, Bratislava	Chairman of Cosmetic Committee	continue
Hojerová,J.	INCHEBA, Joint Stock Company, Technical Committee for Cosmetics	Chairman of Cosmetic Committee	continue
Hojerová,J.	Slovak Society of Cosmetology	President	continue
Hojerová,J.	Member of Editorial Board of SLOVAK CHOICE	Member	Since 2005
Boreková, M.	Slovak Society of Cosmetology	Member	continue

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Schmidt,Š.	Federation of European Chemical Societies, division of Food Chemistry	Member	continue
Schmidt,Š.	Editorial board of European Journal of Lipid Science and Technology	Member	continue
Staruch,L.	Editorial board of journal MASO	Member	Since 2003-
Staruch,L.	WEPSA, Israel	Member	continue
Augustín,J.	Czechoslovak Microbiology Society	Member	continue
Hojerová,J.	International Federation of Societies of Cosmetic Chemists, USA	Member	continue
Boreková, M.	International Federation of Societies of Cosmetic Chemists, USA	Member	continue
Greifová,M.	Czechoslovak Microbiology Society	Member	continue
Dandár,A.	American Chemical Society	Member	continue
Dandár,A.	International Commission for Uniform Methods of Sugar Analysis – ICUMSA, Italy	Member	continue
Dandár,A.	Commission International Technique de Sucrierie – CITS, Brussels, Belgium	Member	continue
Dandár,A.	Verein der Zuckerfabriken Österreichs, Vienna, Austria	Member	continue
Dandár,A.	Stowarzyszenie Technikow Cukrownikow, Wroclaw, Poland	Member	continue
Dandár,A.	Scientific board at FCHPT VŠCHT, Prague	Member	continue
Dandár,A.	Editorial board of journal Listy cukrovarnické a řepařské	Member	continue

#### E. Visitors from Abroad

Name	Organisation or Institution	State	Date / Duration
Pločková,M., Filíp, V.	University of Chemical Technology, Prague	Czech Republic	June 2007 (2 days)
Filíp, V., Poláková, L., Zarubová, M.	University of Chemical Technology, Prague	Czech Republic	February 2007 (2 days)
Surówka, K.	Agricultural University, Krakow	Poland	September 2007 (3 days)
Iciek, J., Kula, S., Krol, J.	Technical University of Lodz	Poland	September 2007 (4 days)
Bubník, Z., Kadlec, P.	University of Chemical Technology, Prague	Czech Republic	November, December 2007 (2 days)
Valter, V.	Research Institute of Sugar Technology, Prague	Czech Republic	November, December 2007 (2 days)

Bovóli, V.	SA.FO.SA, Milano	Italy	April 2007 (1day)
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#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation or Institution	State	Date / Duration
Minarovičová, L., Jancurová, M.	Sugar Technology Conference, Luhačovice	Czech Republic	January 2007 (3 days)
Minarovičová, L., Jancurová, M., Zahradníková, L., Krajčová, E., Staruch, L.	XXXVIII. Symposium about New Ways in Food Production and Food Evaluation, Skalský Dvůr	Czech Republic	May 2007 (3 days)
Minarovičová, L., Dandár, A.	Conference Polysaccharides III., Prague	Czech Republic	September 2007 (3 days)
Krajčová, E., Greifová, M., Greif, G., Staruch, L.	Milk and Cheese Conference, Prague	Czech Republic	January 2007 (3 days)
Dandár, A.	Agricultural University, Olsztyn	Poland	September 2007 (4 days)
Dandár, A.	Sugar Factory Agrana, Leopoldsdorf	Austria	October 2007 (1 day)
Dandár, A.	Zuckerforschung Institut, Tulln	Austria	October 2007 (1 day)
Hojerová, J.	International Cosmetic Conference, České Budejovice	Czech Republic	October 2007 (3 days)
Schmidt, Š.	University of Chemical Technology, Prague	Czech Republic	March, May, June, Oct., Dez. 2007 ( 20 days )
Bilaničová, D.	Università di Cagliari	Italy	1.2. – 31.6.2007
Zufarov, O. Janáč, L., Sekretár, S.	International Conference of Technology and Oil Analytic, Janov nad Nisou	Czech Republic	May 2007 (3 days)

### VII. THESES AND DISSERTATIONS

#### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Mečiarová, I.	Pseudocereals and their Utilization.	Jancurová, M.
Paškuliaková, A.	The Non-traditional Cereals and their Usage in Food Technology.	Jancurová, M.
Pažoureková, S.	Authentification of Meat Products.	Kohajdová, Z.
Smetanková, J.	Pathogens in Raw Cow Milk.	Greifová, M.
Sopčáková, Z.	Dairying in Slovakia.	Greifová, M.

#### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Gajdošová, Z.	Protective Properties of Some Lactic Acid Bacteria.	Greifová, M.
Gajdošová, Ž.	Influence of Selected Additives on Quality of Wheat-Spelt Baked Goods.	Kohajdová, Z.

Kollárová, L.	Oxidative Stability of Lipids in Multiphase Systems.	Sekretár, S.
Kraková, T.	Enzymatic Esterifications of Saccharides.	Greifová, M., Mastihuba, V.
Kunštek, M.	Application of NATAMICINE for Production of Fermented Meat Products.	Staruch, L.
Kušíková, Z.	Monitoring of Effect of Chickpea Mixture and Palm Oil on the Quality of Bakery Products.	Minarovičová, L.
Oravcová, K.	Monitoring of Changes of Selected Analytical Parameters in Lactic Acid Fermented Vegetable Juices and Tomato Products.	Karovičová, J.
Pogáň, G.	Microbiological and Sensory Evaluation FMP after Application of NATAMYCINE.	Staruch, L.
Sekelyová, Z.	Antioxidant Properties of Compounds of Evening Primrose Extract.	Zahradníková, L.
Stopková, M.	Study of Quality of Bakery Products with Addition of Selected Additives.	Dandár, A.
Škottová, D.	Rapid Microbiological Detection of Dental Cosmetic Products.	Hojerová, J.
Toporková, M.	Properties and Stability of Crushed Walnuts and Walnut Oil.	Schmidt, Š.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Lukáčová, D.	Study of Fermentation Conditions for Plant Juices with Addition of Functional Compounds.	Karovičová, J.
Minarovičová, L.	Research of Physical – Chemical Processes of Beet Juice Purification.	Dandár, A.
Zahradníková, L.	Stabilization of lipid matrixes using plant extracts.	Schmidt, Š.

## VIII. PUBLICATIONS

### Books

- [1] Ondrejškovičová, I., Izakovič, M., Koreňová, A., Klein, E., Hojerová, J., Jantová, S.: Chémia a biológia v bežnom živote. Vydavateľstvo STU v Bratislave, 2007.
- [2] Ondrejškovičová, I., Kovařík, P., Šajbidor, J., Slugeň, D., Hojerová, J., Markoš, J., Kaszonyi, A., Izakovič, M., Jantová, S.: Život okolo nás očami chemika a biológa. Vydavateľstvo STU v Bratislave, 2007.

### Chapter or pages in book

- [1] Hojerová, J.: Život okolo nás očami chemika a biológa. Editor(s): Ondrejškovičová I., Izakovič, M., Chapter: Hydrokoloidy v bežnom živote. Vydavateľstvo STU v Bratislave. pp. 46-56, 2007.
- [2] Hojerová, J.: Život okolo nás očami chemika a biológa. Editor(s): Ondrejškovičová I., Izakovič, M., Chapter: Zubná pasta. Vydavateľstvo STU v Bratislave. pp. 40-47, 2007.

### Article in journals

- [1] Augustín, J.: Minerálne látky vo výžive a zdraví. Výživa a potraviny. Zpravodaj pro školní stravování, no. 1, pp. 21-22, 2007.
- [2] Augustín, J.: Minerálne vody z pohľadu výživy a zdravia. Výživa a zdravie, no. 3/4, vol. 50, pp. 6-8, 2007.
- [3] Dandár, A., Minarovičová, L.: Čistenie extraktov stévie cukrovej. ChemZi, no. 3, vol. 1, pp. 255-256, 2007.
- [4] Dandár, A., Minarovičová, L.: Extrakcia a čistenie extraktov stévie cukrovej. Chemické listy, no. 9, vol. 101, pp. 747, 2007.
- [5] Dodok, L., Šturdík, E., Staruch, L.: Akrylamid v potravinách. Pekárstvo Cukrárstvo, no. 1, vol. 8, unpagged 2007.
- [6] Greifová, M., Krajčová, E., Greif, G.: Antifungálna aktivita baktérií mliečneho kysnutia. Mliekarstvo, no. 2, vol. 38, pp. 35-40, 2007.
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- [8] Hojerová, J., Šovčíková, D., Mikula, M.: In vitro evaluation of the UV filters photostability. Journal of the Polish Society of Cosmetic Chemists, no. 4, vol. 9, pp. 11-16, 2007.

- [9] Hojerová, J.: Nový spôsob hodnotenia účinnosti a označovania prípravkov na opaľovanie. *Derma*. no. 1, vol. 7, pp. 26-29, 2007.
- [10] Hojerová, J.: Významné zmeny v kozmetike na ochranu pred slnečným žiarením. *Derma revue*, no. 1, vol. 5, pp. 7-8, 2007.
- [11] Janáč, L., Sekretár, S., Schmidt, Š., Zahradníková, L.: Možnosti stabilizácie jedlých tukov počas mikrovlnného ohrevu. *ChemZi*, no. 1, vol. 3, pp. 137-138, 2007.
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## I. STAFF

### Full Professors:

Stanislav Biskupič, PhD., DSc.; Vlasta Brezová, PhD., DSc.; Andrej Staško PhD., DSc.; Peter Šimon, PhD., DSc.

### Associate Professors:

Martin Breza, PhD.; Ján Cvengroš, PhD., DSc.; Anton Gatíal, PhD.; Pavel Kovařík, PhD.; Jozef Kožíšek, PhD.; Milan Mazúr, PhD., DSc.; Jiří Polavka, PhD., Peter Rapta, PhD., DSc.; Marián Valko, PhD., DSc.

### Assistant Professors :

Dana Dvoranová, PhD.; Erik Klein, PhD.; Ľubomír Zalibera, PhD.

### Research Fellows:

Zuzana Cibulková, Marek Fronc; Andrea Kleinová, Jarmila Paligová

### PhD Students:

Lukáš Bučinský, Linda Cséfalvayová, Marián Gall, Martin Gróf, Martin Hudák, Miroslava Kleinová, Ingrid Kortišová, Martin Matis, Katarína Matuszová, Lucia Perašinová, Stanislava Šoralová, Andrea Vargová, Zuzana Vrecková, Michal Zalibera

### Technical staff:

Imrich Csonka, Elena Fabíková, Alžbeta Chochulová, Štefan Miksai, Milan Štefunko, Mária Šuleková

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory for the Basic Course of Physical Chemistry  
Laboratory for the Advanced Course of Physical Chemistry  
Laboratory of Electronics  
Laboratory of UV-VIS and IR Spectroscopy  
Computational Laboratory

### B. Research laboratories:

Laboratory of Thermal Analysis and Calorimetry  
Laboratory of EPR Spectroscopy  
Laboratory of IR spectroscopy  
Laboratory of X-ray analysis  
Laboratory of Molecular Distillation and Alternative Diesel Fuels

## III. TEACHING

### A. Undergraduate Study:

<b>3. semester (Bc)</b>	Physical Chemistry I	(3-2 h)	V. Brezová
	Physical Chemistry I	(2-2 h)	S. Biskupič, A. Gatíal, M. Mazúr, D. Dvoranová, E. Klein
	Physical Chemistry II	(3-2 h)	P. Rapta
	Laboratory Practice in Physical Chemistry I	(0-3 h)	E. Klein
	Laboratory Practice in Physical Chemistry I	(0-2 h)	E. Klein
	Physical and Colloid Chemistry	(2-2 h)	P. Šimon
<b>4. semester (Bc)</b>	Physical Chemistry II	(3-2 h)	S. Biskupič, A. Gatíal, P. Kovařík, M. Mazúr
	Laboratory Practice in Physical Chemistry II	(0-3 h)	E. Klein
<b>5. semester (Bc)</b>	Physical Fundamentals of Spectroscopic Methods	(2-2 h)	A. Staško, V. Brezová
<b>6. semester (Bc)</b>	Biophysical Chemistry	(2-2 h)	M. Valko

<b>1. semester (MSc)</b>	Chemical Physics I	(2-1 h)	M. Breza
	Thermodynamics	(2-1 h)	P. Šimon
	Kinetics and Catalysis	(2-1 h)	P. Kovařík
	Colloid Chemistry	(2-0 h)	T. Bleha
	Statistical Treatment and Evaluation of Exp. Data	(2-0 h)	E. Klein
<b>2. semester (MSc)</b>	Group Theory and Symmetry	(2-0 h)	M. Breza, V. Kvasnička
	Special Laboratory Practice I	(0-8 h)	P. Rapta
	Chemical Physics II	(2-1 h)	S. Biskupič
	Biophysical Chemistry	(2-0 h)	M. Valko
<b>3. semester (MSc)</b>	Special Laboratory Practise II	(0-6 h)	P. Rapta
	Traineeship, Excursion		
	Molecular Spectroscopy	(2-1 h)	A. Staško
	Chemical Physics III	(2-0 h)	A. Gaňal
	Solid State Physics	(2-0 h)	M. Breza
<b>4. semester (MSc)</b>	Special Laboratory Practice III	(0-10 h)	P. Rapta
	Diploma Thesis	(0-30 h)	

## IV. CURRENT RESEARCH PROJECTS

### DEVELOPMENT AND APPLICATION OF COMPUTATIONAL METHODS TO THE STUDY OF ELECTRONIC STRUCTURE OF MOLECULAR SYSTEMS (Stanislav Biskupič)

Quantum-chemical study of electron structure of transition metal and similar atoms complexes (such as catalysts based on Cu, Ni, Ru etc., Pb complexes, phosphazenes).

Vibration and NMR spectroscopy and X-ray experimental study of the structure of some new-synthesized push-pull olefins as model compounds for the synthesis of new heterocyclic biologically active materials (or with possible biological activity).

Program implementation of the methods for calculation of the vibrational-rotational states of the van der Waals complexes for analytically formulated potential energy hypersurfaces. Program modification of the expressions in the framework of the symmetry adapted perturbation theory (SAPT) for the effective evaluation of the 4th order contributions to the dispersion energy for mutual interaction of the open- and closed-shell systems within the UHF method.

Implementation of the present software products for extraction of the so called experimental wave function (correctly said : the experimental distribution of the electron density) from X-ray data (the implementation of the object oriented package TONTO).

Project duration: from 2006 to 2008

### SPECTROSCOPICAL ANALYSIS OF STRUCTURE AND REACTIVITY OF RADICALS AND TRANSITION METAL COMPLEXES IN CHEMICAL, BIOLOGICAL AND PHOTOCHEMICAL SYSTEMS (Vlasta Brezová)

The aims of the project are the investigations of the structure and reactivity of radical intermediates and metal complexes in the chemical, electrochemical, photochemical, and biological systems applying spectroscopic methods (EPR, UV/Vis/NIR spectroscopy) and electrochemical techniques (voltammetry). The research is oriented especially on the physicochemical characterization of organic materials with specific properties, e.g. conducting polymers, as well as on the study of magnetic, redox and spectroscopic properties of transition metal complexes. The photochemical investigations are focused on the primary radical intermediates generated upon photoexcitation of organic compounds in heterogeneous titanium dioxide systems, as well as in homogeneous solutions using spin trapping technique. A further systematical development of combined spectroelectrochemical and spectrophotocatalytic methods, as well as an improving of experimental techniques and the analysis of error sources in quantitative EPR spectroscopy will be carried out.

Project duration: from 2006 to 2008

### MATERIALS – physico-chemical methods of their study (Peter Šimon)

The project is aimed at the development of methods of materials study and their use for processes exhibiting the induction period, e.g. thermooxidative processes and phase transitions. Non-stabilized and stabilized polymers and other materials belong to the main objects of the study. From the measurement of residual thermooxidative stability, the equivalency between accelerated ageing tests and natural ageing of materials is determined. The method will be applied for the life-time prediction of materials under extreme conditions, i. e. in automotive

industry and nuclear power plants. Experimental results will be interpreted using theoretical models involving kinetics, thermodynamics and statistical thermodynamics of processes with the implementation of modern mathematical approach, such as the fractal theory and neural networks.

Project duration: from 2006 to 2008

### **ELECTRON STRUCTURE AND PROPERTIES OF MATERIALS IN SOLID PHASE (Jozef Kožišek)**

The ambition of the solved project is the integrated study of the selected systems in solid state with possible applications in understanding the mechanisms of enzymatic reactions in biological systems, developing new materials (spin cross-over systems), or catalysts for asymmetric synthesis. Project benefits from just developed laboratory for studying electronic structure (GEMINI R diffractometer, 16-processor cluster), running EU project in HASYLAB/DESY (synchrotron radiation), as well as the possibility to make data collection on neutron sources (Garching, Grenoble).

Project duration: from 2005 to 2007

### **LIQUID FUELS BASED ON VEGETABLE OILS AND ANIMAL FATS FOR TRANSPORT AND ENERGETICS (Ján Cvengroš)**

Project is focused on the study of non-traditional utilization of natural triacylglycerols (TAG) as liquid fuels for transport and energetics, hydrogenation cracking of TAG, utilization of mixtures naphtha and ethanol and/or TAG as diesel fuels, energetic utilization of glycerol. The targets of the project are as follows:

- Study of natural TAG hydrogenation cracking and hydro-isomerisation, complex analysis of products and their blends with fossil fuel, process optimization, documentation for application.
- TAG or TAG + bio-ethanol blend as a fuel for non-adapted / adapted diesel fuel, laboratory and bench engine tests neat / additived TAG / TAG + bio-ethanol, TAG treatment, optimization of treatment. Blended fuel TAG + fossil fuels for diesel engines.
- Laboratory and engine tests of blends fossil fuel + bio-components (ethanol, ethanol + FAME), their parameters, additived for improvements of the parameters of mixed fuel.
- Energetic utilization of GP or partly refined G, direct combustion of highly pre-heated GP or G by spraying through nozzles in combustion chamber, combustion of GP/G as blended fuel with fossil component or methanol.

Project duration: from 2006 to 2009

### **ANTIOXIDANT AND PROOXIDANT PROPERTIES OF CAROTENOIDS - EPR STUDY (Marián Valko)**

Carotenoids are pigments that are found in plants and microorganisms and may prevent or inhibit certain types of cancer, atherosclerosis, age-related muscular degeneration, and other diseases. The protective role of carotenoids is related to their antioxidant ability to efficiently scavenge free radicals. The main objective of this project is to perform a comparative study of antioxidant efficiency of several carotenoids to scavenge oxygen free radicals in solution. However, recent epidemiological studies have surprisingly demonstrated that some carotenoids can also exhibit prooxidant properties. In this connection we plan to investigate the most important factors, such as concentration, role of trace metals ( $\text{Cu}^{2+}$ ,  $\text{Fe}^{2+}$ ), isomerism and oxygen partial pressure ( $p\text{O}_2$ ), which affect a switch between antioxidant and prooxidant behaviour of carotenoids using EPR spectroscopy. In particular the role of cis-trans isomerism within the conjugated chain, which recent biochemical experiments suggest might have a very significant effect on activity, has received little attention.

Project duration: from 2005 to 2007

### **I. SUSTAINPACK - Innovation and Sustainable Development in the Fibre Based Packaging Value Chain (Peter Šimon)**

FP6 EU project aimed to mobilising the European scientific expertise in the packaging value chain to establish the European forest industry cluster as the dominant player in the packaging area within a decade. It will be implemented through the Sustainpack project which is intended to make real breakthroughs in fibre based packaging.

The overall objective of the RTD activities is to develop and implement a Sustainable Packaging Tool Platform based on renewable resources, giving innovative properties to packaging, thereby offering new value added packaging options for packaging users and for consumers. The Tool Platform comprises New Innovative Material Properties and New Innovative Process Developments to transform these materials into new packaging solutions.

Project duration: from 2004 to 2008

### Anti-aging at the Molecular Level: Antioxidants in Slovak and Austrian Wines (Vlasta Brezová)

Bilateral Slovakia-Austria project focused on development and application of experimental spectroscopic techniques (EPR, UV/vis and FTIR) for the quantitative determination of wines antioxidant capacity. Analysis of Slovak and Austrian wines antioxidant properties and selection of effective antioxidants in wines with the beneficial effects on human health.

Project duration: from 2006 to 2007

### AvH Joint research project Dresden/Bratislava 3 Fokoop DEU/1063827

The main idea of the project is the study of the novel aromatic and heteroaromatic compounds with extended  $\pi$ -conjugation with respect to the injection of charge, the structure of charged states and their equilibrium. This can be studied by in situ spectroelectrochemical techniques which enable detailed kinetic and structural studies of charged states of extended  $\pi$ -systems. Additionally follow-up reactions after electron transfer on organic molecules such as dimerisation, diradical and charge transfer complex formation and the building of clusters is the subject of the research plan. The proposed research project is based on know-how and experiences of the project partners in the model-chemical measurements, theoretical modeling and synthesis of the systems with high  $\pi$ -extension. Organic structures like furan, thiophene, pyrrole, imidazole, pyrazine and fullerene derivatives suitable for opto-electronic devices and newly synthesized in Bratislava and Dresden, will be studied both in solutions and as solid films using cyclic voltammetry, optical absorption (UV-Vis-NIR) and ESR spectroscopy in order to estimate their charge states, optical properties and stability.

Project duration: from 2006 to 2009.

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Research Inst. Food	scientific	P.Šimon	2007
BEL/Novaman	scientific, industrial	P.Šimon	2007
Res.Inst.Chem. Technology	scientific	P.Šimon	2007
St. Cyril and Methodius University, Trnava	scientific	A. Gatial	2007
VULM, Modra	scientific, industrial	J. Cvengroš	2007
CMS, Bratislava	scientific, industrial	J. Cvengroš	2007
UK, Bratislava	scientific, industrial	J. Cvengroš	2007
Biorafinéria, Martin	scientific, industrial	J. Cvengroš	2007
VÚRUP, Bratislava	scientific, industrial	J. Cvengroš	2007

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
LTNW, Manchester, UK (F.Kvasnik)	scientific	P.Šimon	2007
University of Technology, Sydney, Australia (A.Ray, P.Thomas)	scientific	P.Šimon	2007
Faculty of Chemistry, Technical University, Brno, Czech Republic (L.Omelka)	scientific	P.Šimon	2007
STFI-Packforsk, Stockholm, Sweden (Dr. K. Johansson)	scientific	P.Šimon	2007
PIRA, Leatherhead, UK (Dr. M. Sturges)	scientific	P.Šimon	2007
ITENE, Valencia, Spain (Dr. S. Aucejo)	scientific	P.Šimon	2007
DTI, Roskilde, Denmark (Dr. S. Østergaard)	scientific	P.Šimon	2007
Liverpool John Moores University, UK (Prof. M. Cronin)	scientific	M. Valko	2007
Roosevelt University, Chicago, USA (Prof. J. Telsler)	scientific	M. Valko	2007
Bremen University (Prof. D. Leibfritz)	scientific	M. Valko	2007
Institut für physikalische und theoretische Chemie Technische Universität Graz	scientific	V. Brezová	2007



IFW Dresden, Germany	scientific	P. Rapta	2007
University of Western Australia, Perth (D. Jayatilaka)	scientific	S. Biskupič	2007
University Stuttgart, Germany (W. Kaim)	scientific	M. Breza	2007
University of Vienna, Austria (L. Benco)	scientific	M. Breza	2007
NORA Lovech, Bulgaria	scientific	J. Cvengroš	2007

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
P. Šimon	Slovak Chemical Society	other	2007
S. Biskupič	Slovak Chemical Society	other	2007
V. Brezová	Slovak Chemical Society	other	2007
J. Cvengros	Slovak Chemical Society	member	2007
J. Cvengros	Slovak Society of Chemical Engineering	member	2007

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
P. Šimon	International Congress on Thermal Analysis and Calorimetry (ICTAC)	member	2007
S. Biskupič	International Society for Theoretical Chemical Physics, Germany	member	2007
S. Biskupič	International ESR Society, USA	member	2007
S. Biskupič	American Chemical Society, USA	member	2007
J. Cvengros	American Oil Chemist's Society	member	2007

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Søren Østergaard	Dannish Technological Institute, Roskilde	Denmark	April 26-28 3 days
Helle Antverskov	Dannish Technological Institute, Roskilde	Denmark	April 26-28 3 days
Alexander Popkov	Jihočeská universita, České Budejovice	Czech Republic	May – 14 days
Joshua Telser	Roosevelt University, Chicago	USA	July – 7 days
Mark Cronin	John Moore University, Liverpool	Great Britain	November – 5 days
Judy Maden	John Moore University, Liverpool	Great Britain	November – 5 days

### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
J. Cvengroš	Workshop of EU law on disposal of waste oils – Targovshte	Bulgaria	January 18 – 19 2 days
D. Dvoranová	7th Workshop of Physical Chemists and Electrochemists – Brno	Czech Republic	January 29 – 30 2 days
E. Klein	7th Workshop of Physical Chemists and Electrochemists – Brno	Czech Republic	January 29 – 30 2 days
P. Šimon	STFI Packforsk – Stockholm	Sweden	February 11 – 14 4 days
M. Valko	Free radicals in biosystems – conference	Kuwait	March 18 – 22 5 days
L. Bučinský	Relativistic Effects in Heavy Elements (REHE) 2007 – Domaine Saint-Jacques, Ottrot	France	March 21 – 25 4 days
S. Biskupič	Relativistic Effects in Heavy Elements (REHE) 2007 – Domaine Saint-Jacques, Ottrot	France	March 21 – 25 4 days
P. Šimon	Risoe – Roskilde	Denmark	March 25 – 31 7 days
M. Zalibera	IFW Dresden – study stay	Germany	April 1 – June 30 3 months

M. Mazúr	22th NMR Valtice: Central European NMR discussion groups – Valtice	Czech Republic	April 15 – 18 4 days
J. Cvengroš	2. APROCHEM 2007 + ODPADOVÉ FÓRUM 2007 – Milovy	Czech Republic	April 16 – 20 5 days
P. Šimon	IPC CSIC - Madrid	Spain	April 21 – 25 5 days
P. Šimon	A&F – Wageningen	The Netherland	May 21 – 23 3 days
J. Cvengroš	3. Eastern Biofuels Conference - Prague	Czech Republic	May 29 – 31 3 days
P. Šimon	TA conference – Sopron	Hungary	May 29 – 31 3 days
Z. Cibulková	TA conference – Sopron	Hungary	May 29 – 31 3 days
A. Gatíal	XII Blue Danube Symposium on Heterocyclic Chemistry – Tihany	Hungary	June 10 – 13 4 days
M. Valko	University of Manchester – study stay	Great Britain	June 27 – 30 4 days
P. Rapta	IFW Dresden – study stay	Germany	July 2 - 31 1 month
M. Breza	Jihočeská Universita – České Budejovice – study stay	Czech Republic	July 11 – 18 8 days
S. Biskupič	SAMPQP 2007 – Torun	Poland	September 2 – 6 5 days
M. Fronc	WORKSHOP on XD2006 program package – Martina Franca	Italy	September 3 – 6 4 days
J. Kožíšek	WORKSHOP on XD2006 program package – Martina Franca	Italy	September 3 – 6 4 days
L. Perašínová	WORKSHOP on XD2006 program package – Martina Franca	Italy	September 3 – 6 4 days
A. Staško	Vitamins 2007 – Pardubice	Czech Republic	September 18 – 21 3 days
P. Šimon	Bretsznajder Conference – Plock	Poland	September 25 – 29 5 days
M. Breza	CESTC 2007 – Litschau	Austria	September 23 – 26 4 days
S. Biskupič	CESTC 2007 – Litschau	Austria	September 23 – 26 4 days
L. Bučinský	CESTC 2007 – Litschau	Austria	September 23 – 26 4 days
M. Gall	CESTC 2007 – Litschau	Austria	September 23 – 26 4 days
M. Hudák	CESTC 2007 – Litschau	Austria	September 23 – 26 4 days
A. Kleinová	International Congress on Biodiesel – Wien	Austria	November 5 – 11 3 days
J. Cvengroš	International Congress on Biodiesel – Wien	Austria	November 5 – 11 3 days
P. Šimon	UNIBO – Bologna	Italy	November 11 – 14 4 days
P. Rapta	Electrochemical Seminar Prague-Dresden – Freital	Germany	November 15 – 17 3 days
M. Zalibera	Electrochemical Seminar Prague-Dresden – Freital	Germany	November 15 – 17 3 days
A. Vargová	Electrochemical Seminar Prague-Dresden – Freital	Germany	November 15 – 17 3 days
P. Šimon	ITENE – Valencia	Spain	November 25 – 28 4 days
D. Dvoranová	TU Graz – study stay	Austria	Nov 27 – Dec 3 8 days
M. Zalibera	TU Graz – study stay	Austria	Nov 27 – Dec 3 8 days
L. Bučinský	23rd Winter School in Theoretical Chemistry – Helsinki	Finland	December 10 – 14 5 days

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Barbieriková Zuzana	EPR Study of Oxygen Photoactivation in the Presence of Quinolones	Vlasta Brezová
Czaniková Klaudia	EPR Study of Antioxidant Properties of Coffee	Vlasta Brezová
Gocian Jozef	EPR Study of photochemical Reactions of Citronellol	Dana Dvoranová
Heřman František	Study of Antioxidants and their Influence on Stabilization of Polymers	Erik Klein
Husáriková Lucia	Uncertainties in Quantum Chemistry	Stanislav Biskupič
Lušpai Karol	Redox Reactions of Selective Substituted Pyrrolylbenzenes (in situ EPR/UV-Vis Spectroelectrochemistry)	Peter Rapta
Mocinecová Dušana	EPR Study of Photocatalytic Activity of TiO <sub>2</sub> Powders Prepared by Mechanochemical Synthesis	Vlasta Brezová
Peller András	Dependence of Thermooxidation Stability of Polypropylene on Degradation Dose	Peter Šimon

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Bořanská Petra	NMR Spectroscopy of Wine	Milan Mazúr
Rimarčík Ján	Theoretical Study of Energetics of Phenols Antioxidant Effect	Erik Klein
Šlebodová Anna	EPR Study of Antioxidant and Radical-scavenging Properties of Coffee	Vlasta Brezová
Šoralová Stanislava	Theoretical Study of Lead(II) Hydroxocomplexes in Aqueous Solutions	Martin Breza
Vrecková Zuzana	EPR Study of Photoinduced Processes of Quinolone Derivatives	Vlasta Brezová

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Teodora Kocsisová	Physico-chemical properties of oleochemical products, their synthesis and application	Ján Cvengroš
Júlia Polovková	Conformational analysis and interpretation of vibrational spectra of push-pull compounds	Anton Gatiaľ
Miroslava Kleinová	Antioxidant and radical-scavenging properties of carotenoids and biological active copper complexes	Marián Valko

### D. Dissertations (DSc)

Name	Title of Thesis
Peter Rapta	Spectroelectrochemical in situ techniques in radical chemistry

## DEPARTMENT OF CHEMICAL PHYSICS

### Head of Department:

Assoc. Prof. Pavol Fedorko, PhD. (since 1.9.2007)

Telephone: ++421259325681  
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Assoc. Prof. Viliam Laurinc, PhD. (till 31.8.2007)

## I. STAFF

### Full Professors:

Fedor Valach, PhD., DSc.

### Associate Professors:

Pavol Fedorko, PhD.; Oľga Holá, PhD.; Viliam Laurinc, PhD.; Vladimír Lukeš, PhD.

### Assistant Professors :

Július Annus; Ladislav Bušovský; Miroslav Tokarčík, PhD.; Daniela Žilinská; Michal Ilčin

### Research Fellows:

Tibor Pálszegi, PhD. (till 31.8.2007)

### PhD Students:

Michal Ilčin; Ján Rimarčík (since 1.10.2007), Roland Šolc

### Technical staff:

Anton Adamko

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Physics I.  
Laboratory of Physics II.

### B. Research laboratories:

Laboratory of X-ray Diffraction  
Laboratory of Electrical Properties  
Laboratory of Gamma Radiation Source  
Laboratory of Computational Chemical Physics

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Seminar in Basic Physics	0/2/0	Bušovský, Bučinský, Gál, Gróf, Lukeš
<b>1. semester (Bc)</b>	Physics I	2/2/0	Bušovský, Fedorko, Holá, Laurinc, Lukeš, Tokarčík, Valach, Žilinská
	Physics Laboratory I.	0/0/2	Annus
<b>2. semester(Bc)</b>	Physics II.	2/2/0	Bušovský, Fedorko, Holá, Laurinc, Lukeš, Tokarčík, Valach, Žilinská
	Physics Laboratory II.	0/0/2	Annus, Bučinský, Gál, Gróf, Ilčin, Lukeš, Olejníková, Pálszegi, Tokarčík, Žilinská
<b>5. semester (Bc)</b>	Modelling of the Molecular Properties	0/2/0	Laurinc, Lukeš, Ilčin
<b>2. semester (MSc)</b>	Statistical Thermodynamics	2/1/0	Laurinc, Lukeš

## B. PhD Study:

	Biophysics I	2/0/0	Valach
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## IV. CURRENT RESEARCH PROJECTS

### A. VEGA Project No 1/3572/06 Molecular modelling of the structural fragments containing the transition element atoms in the crystal structures of metalloproteins (Fedor Valach)

Methods development for the structure solution of fragments involved in the crystal structures of metalloproteins. Molecular modelling of the structural fragments and quantification of their basicity properties. Structural correlations determination of hydrogen bonds and their structural interpretation for the crystal structures of organic, organometallic and coordination compounds. Prediction of valence-bond structure of anionic fragments in the crystals of proteins. Determination and interpretation of the correlations between the metal-ligand bond lengths in the structures of metalloproteins. The criteria development for reliability testing of the protein crystal structures solved from the X-ray and synchrotron diffraction data.

Project duration: from 01.01.2006 to 31.12.2008

### B. VEGA Project No 1/3036/06 Research of electro-optical properties of novel organic materials as precursors with potential application in electronic and nanotechnology (Vladimír Lukeš)

Quantum-chemical study (at the ab initio, DFT and semiempirical levels) of the electronic structure and properties of benzenoid and heterocyclic compounds of furane, thiophene, pyrrole, imidazole and pyrazine derivatives with potential electro- and photoactive properties will be performed. The basic relations between structure (e.g. conformations, effective conjugation length, effect of substituents), microscopic quantities (dipole moments, polarizabilities, hyperpolarizabilities, HOMO-LUMO separation) and absorption and luminescence spectral characteristics will be investigated. A selection of new molecules which are perspective candidates for electro-optical applications and nano-technique will be proposed on the basis of this research.

Project duration: from 01.01.2006 to 31.12.2008

### C. VEGA Project No 1/2021/05 Physical properties of conducting polymers, conducting polymer nanocomposites and new conjugated systems (Pavol Fedorko)

The project deals with two representatives of the conducting polymers, doped polyaniline and doped substituted polythiophene gels, in which the effect of the structural disorder on the electrical properties is studied. In doped polyaniline, disorder is created by thermal and irradiation aging of the material and by adding plasticizers. This also gives information useful from the application point of view. In the frame of this part of the project, the metallic character of the conductivity of doped polyaniline is investigated more in detail. In substituted polythiophene gels, the conformational state of the polymer network and thus the degree of the structural disorder is varied by swelling in solvents and the dependence of the conductivity of the gel on its swelling ratio is studied. Preparation and properties of conducting polymer nanocomposites as materials enlarging the application potential of the conducting conjugated systems are also studied, using polypyrrole covered nanoparticles and carbon nanotubes as conducting fillers. Theoretical modeling and design of new aromatic and heteroaromatic conjugated systems with properties interesting from the point of view of applications in molecular electronics are also part of the project.

Project duration: from 01.01.2005 to 31.12.2007

### E. APVT Project No 20-005004 Study of stabilisers in polymer matrices – relation between their structure and stabilising effects (Vladimír Lukeš)

Project is oriented on finding suitable (environment-friendly and non-toxic) antioxidants and their concentration relations which are necessary for effective stabilization of polymers (e.g. polyisoprene, PVC, polyurethane, etc.). The stability of polymers with selected additives is experimentally investigated (DSC, spectral measurements). The materials suitable for application in medicine and food industry are subjected to the gamma irradiation and the irradiation effect is investigated. As a part of our research, the dependence between effect and structure of used antioxidants is also studied.

Project duration: from 01.01.2005 to 31.12.2007

#### **F. APVT Project No 20-029804 Functional supramolecular surface nanostructure based on cyclodextrins (Tibor Palszegi)**

Project proposes an integration of theoretical and experimental research results with a focus on a functional surface nanostructure. Our proposal on the nanostructured surface is based on three main components, first a practical solid surface is a base, second an attachment film is prepared from chemically modified cyclodextrin molecules to form supramolecular complexes with guest molecules, and third two kinds of functional molecules are selected which provide a functionality as chemical sensor and magnetic memory unit.

Project duration: from 01.06.2005 to 31.05.2007

#### **G. APVV Project No SK-AT-005006 (Bilaterálny projekt, rakúsko-slovenská spolupráca) Theoretical study of photo-physical properties of small five- and six-membered aromatic molecules using TD-DFT and CEO methods (Vladimír Lukeš)**

Quantum-chemical study of cyano- substituted paradiaminophenylene and heterocyclic compounds of thiophene and pyrrole derivatives with potential electro- and photoactive properties will be performed. The vertical excitations based on the RI-CC2, TD-DFT, CIS-ZINDO/S and CEO-ZINDO/S will be calculated. The theoretical and the available experimental data will be compared and will be analysed in terms of MO theory and compared with CEO modes.

Project duration: from 1.1. 2006 to 31.12. 2007

### **V. CURRENT EDUCATION PROJECTS**

#### **A. KEGA Project No 3/3062/05 Multimedia study programme for subject: Ionizing radiation and radiation protection (Ol'ga Holá)**

Creation of a modern internet textbook in ionizing radiation and radiation protection. The output of project - the multimedia textbook - will be available to all students at our university's servers and other users will have CDs at their disposal. It is proposed to use this multimedia didactic means also in various forms of the distance e-learning. The distance e-learning form of education can solve also the problem with the acquisition of the professional qualifications for the work with ionizing radiation. This is the reason for usage of the mentioned textbook not only as the fundamental and unified textbook for the students of universities, but also as the study material for the civil servants responsible for radiation protection, for in-service workers and providers of the professional training.

Project duration: from 01.01.2005 to 31.12.2008

#### **B. Developing project of Ministry of Education of SR: Application of multimedia into teaching-learning process of physics (Ol'ga Holá)**

Verification of asynchronous communication between teachers and students by LMS Moodle. Preparation of study materials and their transformation into Moodle modul, training of teachers, organisation of pilot course. Creation of new multimedia didactic tools for the basic course of physics and application of multimedia tools in pedagogical practise.

Project duration: from 1.4.2006 to 30.4.2007

#### **C. Developing project of Ministry of Education of SR: Creation of multimedia tools and their application in teaching of physics. (Ol'ga Holá)**

Continuation of creation of our own multimedia didactic tools, first of all video-clips and videofilms from the world of physics with perspective of extension on the field of natural science generally. Continuous implementation of multimedia tools into pedagogical process – in all forms of study.

Project duration: from 1.4.2007 to 28.2.2008

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Faculty of Electrical Engineering and Information Technology, SUT Bratislava	e-learning	Assoc.prof. P.Ballo, PhD	2000-
Faculty of Mathematics and Physics, Comenius University, Bratislava	Monitoring of Rn in atmosphere, water and soil	Assoc.prof. K. Holý, PhD	1990-
Faculty of Civil Engineering, SUT Bratislava	Didactic methods	Assoc.prof. J.Lukovičová, PhD	2000-
Institute of Polymers, Slovak Academy of Sciences, Bratislava	Optical measurements of polymers	Prof. P.Hrdlovič, DSc	2000-
Institute of Polymers, Slovak Academy of Sciences, Bratislava	Conducting polymers, composite materials	Mária Omastová, PhD	2002
Faculty of Natural Science, Comenius University, Bratislava	Simulations of linear and nonlinear optical signals	Dr. V.Szöcs, PhD	2000-
Faculty of Mathematics and Physics, Comenius University, Bratislava	e-learning	Mgr. K.Holá	2003-

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Institut für Organische Chemie, J.W.Goethe Universität, Frankfurt/M., Germany	X-ray crystallographic research	Prof. E.Egert	1988-
Institute of Molecular Genetics, Academy of Sciences, Prague, Czech Republic	Protein synthesis	Ing. J.Sedláček	2003-
Institut für Physikalische Chemie, Universität Wien, Vienna, Austria	Electronic excitation transport in polymers	Prof. H.F.Kauffmann	1997-
Institute of Chemistry, University of Wrocław, Wrocław, Poland	X-ray crystallographic research	Prof. Dr. J.Mrozinski	1989-
Laboratoire de Cristallographie, Université de Genève, Switzerland	X-ray crystallographic research	Prof. A.F.Williams	2001-
Chemical Crystallography Laboratory, Oxford University, Oxford, UK	X-ray crystallographic research at low temperatures, crystallographic statistics	Prof. C.K.Prout	1999-
Commissariat à l'Energie Atomique, Grenoble, France	Conducting polymers	Dr. J.P.Travers	1999-
Max-Planck Institut für Festkörperphysik, Stuttgart, Germany	Carbon nanotubes	Dr. S.Roth	2000-
Institute of Physical and Theoretical Chemistry, TU Graz, Austria	Spectral properties of organic molecules	Dr. A.M. Keltner	2005-
Mangalore University, Department of Chemistry, India	X-ray crystallographic research	Prof. B.T. Gowda	2006-
Universität Wien, Austria	Quantum mechanical calculations	Prof. H. Lischka	2006-

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Holá Olga	Union of Slovak Mathematicians and Physicists, Bratislava	member	1970
Laurinc Viliam	Union of Slovak Mathematicians and Physicists, Bratislava	member	1975
Bušovský Ladislav	Union of Slovak Mathematicians and Physicists, Bratislava	member	1975
Fedorko Pavol	Union of Slovak Mathematicians and Physicists, Bratislava	member	1977
Holá Olga	Slovak Physical Society, Bratislava	member	1993
Laurinc Viliam	Slovak Physical Society, Bratislava	member	1993
Valach Fedor	Slovak Physical Society, Bratislava	member	1993
Bušovský Ladislav	Slovak Physical Society, Bratislava	member	1993

Fedorko Pavol	Slovak Physical Society, Bratislava	member	1993
Valach Fedor	Slovak Chemical Society, Bratislava	member	1970

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Valach Fedor	Int. Society for Theoretical Chemical Physics, Erlangen, Germany	member	1990
Laurinc Viliam	Int. Society for Theoretical Chemical Physics, Erlangen, Germany	member	1990
Fedorko Pavol	European Physical Society	member	1994
Valach Fedor	European Physical Society	member	1994
Holá Olga	European Physical Society	member	1994

#### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Ramek M.	Technische Universität, Graz	Austria	May 2007 (2 days)
Kelterrerr A.-M.	Technische Universität, Graz	Austria	July, Oct. 2007 (2 x 2 days)
Hofman O.	Technische Universität, Graz	Austria	October 2007 (2 days)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Lukeš V.	7th Workshop of Physical Chemists and Electrochemists, Brno	Czech Republic	January 2007 (2 days)
Holá O.	2nd International Conference EMTECH, Prague	Czech Republic	March 2007 (5 days)
Fedorko P.	Max-Planck Institut für Festkörperphysik, Stuttgart (Dr. S. Roth)	Germany	Apr. - July 2007 2 x 1 month
Holá O.	Science teaching festival „Science on Stage“, Grenoble	France	April 2007 (5 days)
Lukeš V.	Technische Universität, Graz (Dr. A.-M. Kelterrerr)	Austria	May 2007 (10 days)
Lukeš V.	Symposium on Advanced Methods in Quantum Chemistry, Torun	Poland	Sept. 2007 (5 days)
Ilčin M.	Symposium on Advanced Methods in Quantum Chemistry, Torun	Poland	Sept. 2007 (5 days)
Lukeš V.	Central European Symposium on Theoretical Chemistry, Litschau	Austria	Sept. 2007 (4 days)
Ilčin M.	Central European Symposium on Theoretical Chemistry, Litschau	Austria	Sept. 2007 (4 days)
Šolc R.	Central European Symposium on Theoretical Chemistry, Litschau	Austria	Sept. 2007 (4 days)
Holá O.	Information and Communication Technology in Education, Rožnov pod Radhoštěm	Czech Republic	Sept. 2007 (4 days)
Holá O.	e-Learning, Hradec Králové	Czech Republic	Nov. 2007 (2 days)
Holá O.	29th Days of Radiation Protection, Kouty nad Desnou	Czech Republic	Nov. 2007 (5 days)
Lukeš V.	Helmholtz Institute, Dresden (Prof. L. Dunsch)	Germany	Nov. 2007 (5 days)
Holá O.	New Trends in Physics, Brno	Czech Republic	Nov. 2007 (2 days)



## VII. THESES AND DISSERTATIONS

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Matis M.	Experimental and theoretical study of photo-physical properties of oligothiophenes terminated with fluorene chromophores	Lukeš V.

## VIII. PUBLICATIONS

### Article in journal

- [1] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: N-(3,5-Dimethylphenyl)-2,2-dimethylpropanamide. Acta Cryst. E63, pp. o1945-o1946, 2007.
- [2] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: N-(2-Methylphenyl)acetamide. Acta Cryst. E63, pp. o1977-o1978, 2007.
- [3] Gowda, B.T., Tokarčík, M., Kožíšek, J., Fuess, H.: Sodium N-bromo-2,4-dichlorobenzenesulfonamidate sesquihydrate. Acta Cryst. E63, pp. m2115-m2116 + sup1-sup7, 2007.
- [4] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: 2,2,2-Trimethyl-N-(2-methylphenyl)acetamide. Acta Cryst. E63, pp. o1983-o1984, 2007.
- [5] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: N-(3,5-Dichlorophenyl)-2,2,2-trimethylacetamide. Acta Cryst. E63, pp. o2071-o2072, 2007.
- [6] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: 2,2,2-Trimethyl-N-(3-methylphenyl)acetamide. Acta Cryst. E63, pp. o2073-o2074, 2007.
- [7] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: 2,2,2-Trimethyl-N-(4-methylphenyl)acetamide. Acta Cryst. E63, pp. o2327-o2328, 2007.
- [8] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: 2,2,2-Trichloro-N-(3,4-dichlorophenyl)acetamide. Acta Cryst. E63, pp. o2567-o2568, 2007.
- [9] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: 2,2,2-Trichloro-N-(2-methylphenyl)acetamide. Acta Cryst. E63, pp. o2571-o2572, 2007.
- [10] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: N-(3,5-Dimethylphenyl)acetamide. Acta Cryst. E63, pp. o2711 + sup1-sup9, 2007.
- [11] Gowda, B.T., Saviṭha, M. B., Kožíšek, J., Tokarčík, M., Fuess, H.: Sodium 2,4,N-trichlorobenzenesulfonamidate sesquihydrate. Acta Cryst. E63, pp. m1646 + sup1-sup8, 2007.
- [12] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: Sodium N-bromo-4-chlorobenzenesulfonamidate sesquihydrate. Acta Cryst. E63, pp. m1647-m1648 + sup1-sup10, 2007.
- [13] Gowda, B.T., Jyothi, K., Kožíšek, J., Tokarčík, M., Fuess, H.: N,N,4-Trichlorobenzenesulfonamide. Acta Cryst. E63, pp. o2905 + sup1-sup5, 2007.
- [14] Gowda, B.T., Sowmya, B.P., Kožíšek, J., Tokarčík, M., Fuess, H.: N-(2-Chlorophenyl)benzamide. Acta Cryst. E63, pp. o2906 + sup1-sup7, 2007.
- [15] Gowda, B.T., Usha, K.M., Kožíšek, J., Tokarčík, M., Fuess, H.: Sodium N-bromobenzenesulfonamidate sesquihydrate. Acta Cryst. E63, pp. m1739-m1740 + sup1-sup7, 2007.
- [16] Gowda, B.T., Nayak, R., Kožíšek, J., Tokarčík, M., Fuess, H.: Benzenesulfonamide. Acta Cryst. E63, pp. o2967 + sup1-sup7, 2007.
- [17] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: Sodium N-bromo-4-chloro-2-methylbenzene-sulfonamidate sesquihydrate. Acta Cryst. E63, pp. m1957 + sup1-sup8, 2007.
- [18] Gowda, B.T., Kožíšek, J., Tokarčík, M., Fuess, H.: Sodium N-bromo-4-fluorobenzenesulfonamidate sesquihydrate. Acta Cryst. E63, pp. m1958 + sup1-sup8, 2007.
- [19] Gowda, B.T., Sowmya, B.P., Tokarčík, M., Kožíšek, J., Fuess, H.: N-(2,3-Dichlorophenyl)benzamide. Acta Cryst. E63, pp. o3326 + sup1-sup7, 2007.
- [20] Gowda, B.T., Babitha, K. S., Tokarčík, M., Kožíšek, J., Fuess, H.: 4,6-Dimethylbenzene-1,3-disulfonamide. Acta Cryst. E63, pp. o3361 + sup1-sup7, 2007.
- [21] Gowda, B.T., Sowmya B.P., Tokarčík, M., Kožíšek, J., Fuess, H.: N-(3,4-Dichlorophenyl)benzamide. Acta Cryst. E63, pp. o3365 + sup1-sup9, 2007.
- [22] Holá, O.: Computer-based Education in Physics. Problems of Education in the 21th Century: Science Education in a Changing Society. Vol 1, pp. 44-49, 2007.
- [23] Ilčín, M., Lukeš, V., Laurinc, V., Biskupič, S.: On the viscosity and physical origin of stability of weakly bound complexes CdZn, HgZn and HgCd. Collection of Czechoslovak Chemical Communications 72, pp. 363-378, 2007.
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chain length. *J. Phys. Chemistry B* 111 (28), pp. 7954-7962, 2007.

- [25] Lukeš, V., Matuszná, K., Rapta, P., Dunsch, L., Aquino, A., Lischka, H.: Electronic excitations in a ladder type fluoranthenopyracylene in its neutral and charged states: A theoretical and experimental study. *Zeits. für Phys.* 221, pp. 911-928, 2007.
- [26] Lukeš, V., Breza, M.: Thermochromism of bithiophenes and internal aromatic chain rotation. *J. Molecular Structure (Theochem)* 820, pp. 35-39, 2007.
- [27] Matuszná, K., Lukeš, V., Rapta, P., Dunsch, L., Aquino, A., Lischka, H.: On the optical properties of fluoranthenopyracylene ladder type molecule series. *Synth. Metals* 157, pp. 214-221, 2007.
- [28] Mičušík, M., Omastová, M., Boukerma, K., Albouy, A., Chehimi, M. M., Trchová, M., Fedorko, P.: Preparation, surface chemistry and electrical conductivity of novel silicon carbide/polypyrrole composites containing an anionic surfactant. *Polymer Engineering and Science*, pp. 1198-1206, 2007.
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- [31] Omastová, M., Mičušík, M., Trchová, M., Fedorko, P., Chehimi, M. M.: Vlastnosti kompozitov SiC/polypyrrol pripravených v prítomnosti aniónových tenzidov. *Chemical Papers* 61, p. 199, 2007.
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### Article in conference proceedings

- [1] Blahušík, M., Onderková, B., Schlosser, Š., Annus, J.: Microfiltration of suspensions of microparticulate boron adsorbent in submerged hollow fibre and capillary modules. In: PERMEA 2007 Membrane Science and Technology Conference of Visegrad Countries, Sept. 2-6, 2007, Sífók, Hungary. Book of Abstract, p. 146, 2007.
- [2] Griesser, M., Kelterer, A.-M., Lukeš, V.: TDDFT Calculation of Absorption and Emission Spectra in Solution of Tetracyanothiophene and Tetracyanopyrrole. In: 6th Central European Symposium on Theoretical Chemistry, Book of Abstracts. p. 17, 2007.
- [3] Hofmann, O.T., Stickler, B., Kelterer, A.-M., Lukeš, V., Pálszegi, T.: Theoretical calculations of the photophysics of tetracyano-p-phenylenediamine in solution. In: 106. Bunsentagung, May 17-19, 2007 Graz, Austria. p. 127, 2007.
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- [5] Holá, O., Žilinská, D., Földesová, M., Ujhelyiová, A., Široký, J.: Physical and Mechanical Properties of Irradiated Thermo-insulating Materials. In: Industrial Toxicology 07, 27th International Symposium Proceedings, May 30 - June 1, 2007. Bratislava, Slovak Republic. STU Bratislava, pp. 202-207, 2007.
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### Assistant Professors :

Ačai Pavel, PhD, Šedová Marcela, PhD, Timár Pavel, PhD; Haydary Juma PhD; Steltenpohl Pavol, PhD

### Research Fellows:

*Senior research fellow:* Schlosser Štefan, PhD

*Research fellows:* Antošová Monika, PhD, Illeová Viera, PhD; Marták Ján, PhD, Kiša Michal, Onderková Zdenka, Wrzosek Katarzyna

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### Technical staff:

Dudášová Barbora, Ing.; Hinca Miloš; Ördögová Marta; Rizman Viliam;

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Chemical Engineering  
Laboratory of Unit Operations  
Laboratory of Reaction Engineering  
Laboratory of Membrane Processes  
Laboratory of Chemical Engineering Thermodynamics  
Membrane Processes and Membrane Reactors

### B. Research laboratories:

Laboratory of Chemical Reaction Kinetics and Reaction Engineering  
Laboratory of Membrane Processes and Membrane Reactors  
Laboratory of Adsorption and Bioprocess Engineering  
Laboratory of Bioprocess Engineering  
Laboratory of Chemical Engineering Thermodynamics

## III. TEACHING

### A. Undergraduate Study:

1.semester(Bc)	Material balances of technological processes	0/2/0	V. Illeová, Z. Koreňová, I. Tatárová, Z. Švandová, M. Gramblička, K. Vaňková, P. Ačai
1. semester (Bc)	Computer Chemical Engineering Calculations I	0/0/1	J.Stopka, J.Labovský, I.Sikula
2.semester (Bc)	Introduction to Engineering Thermodynamics	0/3/0	E. Graczová
2.semester (Bc)	Computer Chemical Engineering Calculations II	0/0/1	J.Stopka, J.Labovský, I.Sikula
2.semester (Bc)	Fluid Flow Lectures Exercises Laboratory	2/2/1	J.Stopka J.Stopka J.Šefčík, Timár P.
3.semester(Bc)	Heat and Mass Transfer	2/2/1	

	Lectures Exercises Laboratory		J.Stopka J.Šefčík, P.Timár, Steltenpohl
<b>3.semester (Bc)</b>	Computer Chemical Engineering Calculations III	0/0/1	J.Stopka, P.Laššák, M.Hucík
<b>4. semester (Bc)</b>	Separation Processes I Lectures Exercises Laboratory	2/3/1	Polakovič Juma Šefčík, Juma
	Computer Chemical Engineering Calculations III	0/0/1	J.Stopka, P.Laššák, M.Hucík
<b>5. semester (Bc)</b>	Chemical Engineering I Lectures	2/0/0	E. Graczová, Ľ. Jelemenský
	Chemical Engineering I Lectures		V. Štefuca
	Chemical Engineering I Exercises	0/3/0	P. Ačai, P. Steltenpohl, Š. Schlosser, P. Timár, J. Haydary, M. Šedová
	Chemical Engineering I Laboratory	0/0/1	P. Ačai, P. Steltenpohl, Š. Schlosser, P. Timár, J. Haydary, M. Šedová
	Separation Processes II Lectures Exercises Laboratory	2/1/1	Markoš Steltenpohl Šefčík, Steltenpohl
	Equipments for Chemical and Food industry	1/3/0	Ľ. Jelemenský
	Safety Engineering	2/0/0	Ľ. Jelemenský
	Energy Engineering	3/2/0	O. Mierka
<b>6. semester (Bc)</b>	Chemical Engineering II Lectures	2/0/0	E.Graczová, M.Polakovič, V.Štefuca
	Chemical Engineering II Exercises	0/3/0	E. Graczová, J. Haydary, P. Timár, P. Steltenpohl, J.Šefčík, P.Ačai
	Chemical Engineering II Laboratory	0/0/3	P.Timár, P.Ačai, V.Illeová, J. Haydary, M.Kiša, Z.Koreňová, Š.Schlosser, P.Steltenpohl J.Šefčík, I.Tatárová,
<b>6. semester (Bc)</b>	Engineering Thermodynamics Lectures Exercises	2/2/0	O.Mierka, P. Timár O.Mierka, M.Šefčíková, P.Timár
	Technological Project	0/0/4	O. Mierka, V. Štefuca, P. Timár, Z. Švandová, Ľ. Jelemenský, Š. Schlosser
<b>1.semester(MS)</b>	Chemical Engineering Thermodynamics Lectures Exercises	2/2/0	E.Graczová E.Graczová. M.Chlebovec
	Diffusional Separation Processes Lectures Exercises	2/2/0	M.Polakovič M.Juma
	Hydrodynamics and heat Transfer Lectures Exercises Laboratory	2/2/2	J.Stopka J.Stopka J. Labovský
	Advanced Laboratory of Chemical Engineering III	0/0/3	J.Šefčík, E.Graczová, M.Hucík, M.Chlebovec, M.Juma, J.Stopka, Š.Schlosser, P.Steltenpohl,

			V.Štefuca
	Computer Chemical Engineering Calculations	0/0/3	M.Juma, M.Chlebovec
	Fire Engineering Lectures Exercises	2/2/0	L.Jelemenský Z.Švandová
	Selected Unit Operations	2/0/0	J. Markoš
<b>2.semester(MS)</b>	Chemical Reaction Engineering I Lectures Exercises Laboratory	2/2/2	J.Markoš J. Sláva J.Markoš, M. Kotora
	Project from Equipment of Chemical and Food Technology	0/0/3	P.Timár E.Graczová, L.Jelemenský, M.Juma, J.Markoš, O.Mierka, M.Polakovič, J.Stopka,
	Introduction to Safety Engineering	2/1/0	L.Jelemenský. Z.Švandová
	Mass Transfer Theory	2/1/0	J. Markoš
	Bioprocess Engineering I Lectures Laboratory	2/0/1	V.Báleš, M.Polakovič
	Safety Engineering I	2/1/0	L.Jelemenský, Z.Švandová
	Explosion Prevention Lectures Laboratory	2/0/2	L.Jelemenský J.Labovský
	Biochemical Engineering Lectures	2/0/1	Polakovič
	Safety Engineering	2/0/0	Jelemenský
<b>3.semester(MS)</b>	Advanced Laboratory of Chemical Engineering IV	0/0/6	E.Graczová, L.Jelemenský, J. Haydary, M.Polakovič, J.Stopka, J. Šefčík, J. Markoš, O. Mierka
	Process System Engineering Lectures Laboratory	1/0/2	J. Markoš, J. Haydary
	Chemical Reaction Engineering II	2/0/1	J.Markoš
	Cost Engineering of Industrials	0/2/0	O. Mierka
	Energetic Design Project	0/0/2	O.Mierka
	Solid Particles in Technology and Environment	2/0/0	P.Timár
	Bioprocess Engineering II Lectures Laboratory	1/0/1	V.Báleš M. Polakovič
<b>3.semester(MS)</b>	Process System Engineering Lectures Laboratory	2/0/2	J.Markoš J. Haydary
	Safety Engineering II	2/1/0	L.Jelemenský, Z.Švandová
	Laboratory of Process Plant Safety	0/0/3	L.Jelemenský
	Reaction Engineering II	2/0/0	J.Markoš
<b>4. semester (MS)</b>	Master Thésis	0/0/27	Š. Schlosser, P. Timár, J. Šefčík, J. Haydary, O. Mierka, P. Steltenpohl, L. Jelemenský, J. Stopka, E. Graczová, M. Polakovič

## IV. CURRENT RESEARCH PROJECTS

### A. APVT-20-000804 Modeling, simulation and safety analysis of reactive distillation units in chemical industry (Jozef Markoš)

The design of a reactive distillation unit requires detailed knowledge of the reaction kinetics and equilibria of all reactions, vapour - liquid equilibria, and, in the case of heterogeneous catalysis, knowledge of transport phenomena in the catalyst particle as well. Through a mathematical model describing the unit properly, it is

possible to predict changes of the performance parameters switching the unit from one steady state to another one, to find out how to avoid such situation, and how to set the initial parameters for start-up of the unit in order to reach the desired steady state, etc. The aim of the proposed project is to develop such model, to test it using real data from the literature, and to use it for safety analysis, mainly for multiple steady state identification, parametric sensitivity and response of the system to changes of the performance parameters.

*Project duration:* from 01.01.2005 to 31.12.2007

#### **B. VEGA 1/4447/07 Improve safety of chemical processes using virtual dynamic simulator (Ludovít Jelemenský)**

The efficiency of an arbitrary method used for risk assessment of chemical processes of industrial scale influences the process safety and economy. For the achievement of maximal safety at minimal costs up to date, but mainly realistic analyses of danger must be used, because both the complexity and integrity of chemical processes is unceasingly increasing. The aim of the project is to apply an integrated simulation program for hazard assessment. This program is based on the deterministic modelling of a process and was developed for a real chemical process by our research group in the foregoing project. In the new project, development of a virtual dynamic simulator of a real chemical process will be proposed. This simulator could be applied for prediction of potential accidents and operational problems occurring during start-up, operation and shut-down of a process. The proposed approach will contribute to a very effective method for elaborating a safety mode of control of a chosen chemical process.

*Project duration:* from 01.01.2007 to 31.12.2009

#### **C. APVV-0492-06 Mathematical modelling of disperzion hazaredous materials in atmosphere by CFD approach. (Ludovít Jelemenský)**

Mathematical modeling of atmospheric hazardous material dispersion is an inevitable precondition in the risk assessment of chemical plants. It helps in the prediction of possible impacts on the staff and civilians in the close proximity of the plant. Thus, we are able by consecutive measures avoid the consequences or make them less harmful. The used mathematical dispersion model must take into account a lot of information about the location, field and meteorologic conditions, and physico-chemical properties of the materials released. The aim of the project is to obtain a virtual view on hazardous material dispersion in a real 3D block at real time. Then, this modern software package will enable a better simulation of the consequences of release in various places of the real 3D space. Thus training exercises of disaster squads, staff of the plant and civilians living in a close proximity of the plant is possible.

*Project duration:* from 01.01.2007 to 31.12.2009

#### **D. 6 FP NMP2-CT-2005-515831 VIRTUALIS - Virtual Reality and Human Factors Applications for Improving Safety (Ludovít Jelemenský)**

The overall objective of the VIRTUALIS project is to reduce hazards in production plants and storage sites by addressing end-users' practical safety issues, such as training control room operators, designing proper alarm systems, training teams to cope with emergencies, assessing the impact of plant modifications on operators' reliability, helping managers to see the impact of their decisions on sharp-end operators' daily work, through the development of an innovative technology. The new technology will be achieved by merging Human Factors (HF) knowledge and Virtual Reality (VR) technologies. The innovative character of the VIRTUALIS technology will be mainly given by the new HF knowledge that will provide both solutions to cope with identified safety-critical issues and the "driving license" to profitably exploit VR technologies. The new HF knowledge will be produced ad hoc to cope with the specific safety case at hand based on the most advanced HF methodological concepts available.

*Project duration:* from 01.05.2005 to 31.04. 2009

#### **E. LPP-0181-06 Modelling of reactive separation processes (Jozef Markoš)**

Modelling of reactive separation processes. Industrial processes involving chemical reaction and separation in one unit are called reactive separations. Mathematical modelling of reactive separation units represents a useful tool for their design, optimization, parametric sensitivity and safety analysis. The main aim of the proposed project is to develop a non-equilibrium model of a reactive separation unit with very fast reactions in steady state and in dynamic regime and to apply the developed model for simulation of such units.

*Project duration:* from 2006 to 2009



#### **F. VEGA-1/3573/06 Modelling, hydrodynamic and oxygen mass transfer in airlift bioreactors (Jozef Markoš)**

Modelling, hydrodynamic and oxygen mass transfer in airlift bioreactors. The use of airlift reactors in biotechnology becomes more and more extensive. In spite of this fact, most papers published in the literature deals with the use of ALRs only with model media like air – water. The aim of this project is to study the hydrodynamics and mass transfer of oxygen in real fermentation air lift bioreactors. With help of a mathematical model of the reactor and experiments in laboratory ALRs with working volumes of 10, 40 and 200 liters, the influence of a real fermentation broth on ALR hydrodynamics and scale up will be studied.

*Project duration:* from 2006 to 2008

#### **G. VEGA-1/4446/07 Characterization of pyrolysis products from scrap rubber (Jumma Haydary)**

Recycling of tyres by pyrolysis offers an environmentally and economic attractive method. During the pyrolysis process the scrap rubber materials are feeding to the pyrolysis reactor, where they are heated in oxygen free atmosphere for example in a nitrogen atmosphere. As a result of the pyrolysis process the polymers and high molecular compounds are broken down to compounds with lower molecular weight.

The products of the tyre pyrolysis process obtained in all three phases are: solid char (30-40 wt%), liquid residue (50-60 wt%), and gases (3-20 wt%). The solid residue contains carbon black and mineral matter initially present in the tyre. The liquid product consists of a very complex mixture of organic components. The gaseous fraction is composed of non-condensable gases, such as, H<sub>2</sub>, H<sub>2</sub>S, CO, CO<sub>2</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>3</sub>H<sub>6</sub>, etc. The gas fraction can be used as fuel in the pyrolyses process. By using the gas fraction as fuel the need of an external energy source is minimized.

For successful commercialisation of the pyrolysis process the characteristics of the pyrolysis products and their marketability are very important. Solid char (consisting mainly of carbon black) may be used as reinforcement in new rubber products treated to activated carbon. The liquid product (pyro-oil) may be used as fuel or as a source of various chemicals. However, the properties and characteristics of the pyrolysis products depend on the conditions of their production.

The aim of this project is to investigate and determine the influence of process conditions on: the amount of individual pyrolysis fractions, porous structure of carbon black produced, content of Polycyclic Aromatic Hydrocarbons (PAH) in oil fraction.

*Project duration:* from 2007 to 2009

#### **H. VEGA No. 1/2468/05 Hybrid systems with membranes and solvents based on ionic liquids” (Štefan Schlosser)**

Formation and modeling of reaction-separation systems with membranes for simultaneous chemical or biochemical reactions and separations and/or several separation processes. A better understanding of a new generation of solvents and liquid membranes based on ionic liquids used for separation and biochemical transformations.

The aim will be creation of new reaction-separation hybrid systems and development of new analytical methods. Study of microfiltration through ceramic and polymeric membranes with different geometry aimed at modeling of mass transfer and interactions of solutes with the membrane.

Investigation of the possibilities of transfer of data obtained for various geometries of modules. Interactions will be studied mainly on model two-component suspensions.

*Project duration:* from 2005 to 2007

#### **I. International joint project No. MEDRC 04-AS-004 Study of the adsorption- membrane filtration (Amf) hybrid process for removal of boron from seawater“ (Štefan Schlosser)**

International joint project No. MEDRC 04-AS-004 co-financed by MEDRC ([www.medrc.org](http://www.medrc.org)) coordinated by the Ege University, Izmir, Turkey with participation of teams from the Slovak University of Technology and Technical University of Wroclaw and individual experts from other Universities.

*Project duration:* from 2005 to 2007

**J. Project FP6-NMP3-CT-2004-500160, Advanced interactive materials by design (AIMs). (Milan Polakovič)**

This integrated project (AIMs) is targeted at the design of a new class of interactive materials composed of functional elements (ligands) for use in the selective purification steps (*i.e.* chromatography, membrane separation, extraction) of pharmaceutical, chemical and bioindustries. A real breakthrough in the optimization of production processes in these areas requires the integration of material sciences and process development. AIMs focuses on the production of monoclonal antibodies as an example process. The main objectives in terms of radical innovation in monoclonal antibodies production are an increase in capacity by a factor of 10 to 50 and a reduction of cost of goods by a factor of 10 to 100. The STU teams act in one of six subprojects of this integrated project dealing with the characterization of structural and process parameters of investigated materials and processes. The role of STU is to determine accessibility of different chromatographic adsorbents by size-exclusion techniques, the static adsorption capacity of proteins of interest as well as their dynamics of binding. Together with other partners, the correlations between structural and performance parameters are made which are communicated to the partners involved in the material and process design, respectively.

*Project duration:* from 01.04.2004 to 31.03.2008

**K. Project APVT-99-019604, Experimental study of gamma-decalactone production by microbial biotransformation (Vladimír Štefuca)**

The basic aim of the project is the achievement of knowledge necessary for the development of a process of preparation of gamma-decalactone (GDL) - a bioaroma with high added value, by biotransformation from a natural precursor. In order to reach this objective, in the first part of the project, it will be necessary to determine cultivation and biotransformation conditions for a chosen microorganism. The next key task of GDL preparation will be isolation from the culture medium connected with lactonisation of the intermediate product and purification to final purity.

*Project duration:* from 01.01.2005 to 31.12. 2007

**L. Project APVT-20-025704, Process development for biotechnological production of fructooligosaccharides (Milan Polakovič)**

The growing demand for healthy food including non-synthetic additives forms a potential for significant enlargement of the existing production capacities of fructooligosaccharides, which belong to important prebiotics. The ambition of the project is to develop a technological process which could be implemented. The project elaborates all principal steps of the production process which are: aerobic cultivation of cells *Aureobasidium pullulans*, isolation and immobilization of enzyme fructosyltransferase, biocatalytic production of fructooligosaccharides, and the adsorption separation of fructooligosaccharides.

*Project duration:* from 01.01.2005 to 31.12. 2007

**L. VEGA Project No 1/3581/06, Specification of prediction of multi-component vapor-liquid and liquid-liquid equilibria for the purpose of separation of liquids by distillation, extraction and extractive distillation (Elena Graczoová)**

Specification of prediction of two-phase multi-component vapor-liquid and liquid-liquid equilibria necessary for the design of industrial separation equipment like distillation and extraction columns, and for the estimation of optimum operation conditions. Extension of the method of correlation of three-component equilibrium data of two-phase systems (vapor-liquid and liquid-liquid) by the universal ternary contribution. Investigation of the influence of the ternary correction evaluated from ternary vapor-liquid equilibrium data and combined vapor-liquid and liquid-liquid data for obtaining more precise prediction of a complex two-phase four-component equilibrium. Application of the calculation for systems related to the separation of BTX aromatics with mixed extraction solvents.

*Project duration:* from 01.2006 to 12. 2008

**M. APVV-99-004405 Study of 2-phenylethanol formation in an integrated system with continuous product separation (Vladimír Bálaš)**

The basic aim of the project is the achievement of knowledge on biochemistry of 2-phenylethanol formation by yeasts cultivated in media with organic phase. Study of the toxic influence of the product on microbial culture and its elimination by in-situ separation in an external unit will be done. The metabolic activities of selected yeast strains (*Saccharomyces sp.*, *Kluyveromyces sp.*) related to the 2-phenylethanol production will be studied.

Cultivation media composition as well as the process parameters will be optimized. To minimize the toxic effects of the product towards the culture, the mechanism and characteristics of in-situ product extraction during the fermentation process will be used and studied. A suitable organic phase will be selected and tested for in-situ extraction of the product. A continuous product separation system will be constructed and integrated into the system bioreactor - in-situ extraction - separation. Finally, the integrated process for 2-phenylethanol will be designed and optimized in lab- and pilot-scale experiments. Optimal parameters of the batch and continuous processes will be proposed and described. Process data should be used for design of the industrial scale process for production of 2-phenylethanol.

*Project duration:* from 01. 03.06 to 31.12. 09

#### **N. APVV-51-033205, Genetically modified microorganisms as whole cells biocatalysts of enantioselective biooxidations for new immobilized biotechnologies (Vladimír Štefuca)**

The project is aimed at the development of immobilized cell biocatalysts for oxidation of prochiral compounds through the Baeyer-Villiger reaction mechanism. The basic tasks of the Faculty involved are: 1. Development of an optimum biocatalyst particle using experimental and mathematical modeling involving kinetic and mass transfer phenomena; 2. Design and scale up of bioreactors for oxidative biotransformations of chosen compounds.

*Project duration:* from 2006 to 2008

#### **O. APVV project LPP-0234-06, Chromatographic separation of fruktooligosaccharides (Milan Polakovič)**

This project is carried within a programme aimed at the stimulation and support of excellent PhD. supervisors. The content of the project is associated with the education of a PhD. student having the topic of the PhD. study identical with the title of the project.

*Project duration:* from 13.11. 2006 to 31.11.2009

#### **P. VEGA project 1/3582/06, Mechanisms and kinetics of enzyme inactivation (Vladimír Štefuca)**

Enzyme inactivation is a phenomenon, which has unfavorable impact in various areas, such as biocatalytic productions, food processing or application of diagnostic tests. A way to the increase of process stability of enzymes can be a better understanding of their inactivation mechanisms. The primary goal of this project is the investigation of the mechanism of heat and pH inactivation of enzymes in real media, in which the effect of stabilization of enzymes by components of the solution is manifested. The method of identification of inactivation mechanisms is based on a consequent connection of the design of experiments, its performance under a broad range of conditions and evaluation of the kinetics by mathematical modeling. In special cases, the investigation of the mechanism of inactivation will be based on a combined treatment of kinetic data of the loss of enzyme activity and quantities characterizing structural changes, as intensity of laser light scattering or molecular weight distribution obtained by electrophoresis or chromatography. The methods of the investigation of mechanisms are directly related to the elaboration of a procedure for quick determination of process stability of an immobilized biocatalyst in a differential fixed bed reactor.

*Project duration:* from 01.01. 2006 to 31.12.2008

#### **Q. VEGA project 1/3565/06, Engineering aspects of chromatographic separation of proteins and saccharides (Milan Polakovič)**

The project deals with the investigation of engineering aspects of chromatographic separation of a mixture of proteins and saccharides, which are subject of practical interest. Particularly, the purification of IgG, fructosyltransferase (FTase) and fructooligosaccharides (FOS's) has been studied. A problem of general interest is the investigation of the accessibility of pores by batch and column size-exclusion techniques. The aim is the assessment of advantages, disadvantages and limitations of both techniques and the possibility of interpretation of basic data in the form of pore size distribution. A further part of the project includes investigation of equilibrium and kinetics of adsorption of proteins on affinity and ion-exchange adsorbents by a batch method. The investigation of multi-component adsorption equilibria of saccharides on ion-exchangers will be one of the important parts of the project for their further utilization for modeling and designing separation in a simulated moving bed. In the area of separation of enzymes the project will be aimed at characterizing equilibria in various concentrations of salts, which can be employed in mathematical description of separation using salt gradient. The last area of interest will concern the investigation of kinetics of affinity sorption of FTase on an adsorbent with a bound lectin ligand.

*Project duration:* from 01.01. 2006 to 31.12.2008

**R. APVV Project No APVV-0353-06, , Improvement of thermodynamic description of multicomponent vapour - liquid and liquid-liquid-vapour equilibrium systems for the design of separation columns (Elena Graczová)**

Elaboration of a general approach allowing description of multi component multiphase equilibria of vapour-liquid and vapour-liquid-liquid systems based on the knowledge of binary and ternary equilibria of subsystems of the original multi-component mixture. Development of an electronic and a book database of ternary contribution parameters for the most frequently used GE-equations, i.e. the activity coefficients models. To extend the set of experimental data by liquid-vapour equilibria of systems containing components of extraction solvents, used for separation of aromatics (NMP, DMF, sulpholane, higher glycols) with hydrocarbons. Furthermore, we would like to suggest the use of GE equations extended by the ternary contribution for the design of distillation columns. Prediction of basic properties of multi component mixtures and analysis of their separability. Investigation of the influence of improved thermodynamic description of multi component multiphase equilibrium on the quality of extractive and azeotropic distillation design.

*Project duration:* from 02.2007 to 12. 2009

## V. CURRENT EDUCATION PROJECTS

**ACU/2005/04/AF/02 A laboratory for testing construction materials for Herat University (Haydary Juma)**

The project's objective is to contribute to the improvement of quality of higher engineering education in Afghanistan. The major part of the project is implementation of a laboratory for the testing of construction materials at the Herat University and a training program for teachers, who will manage the laboratory. The overall project outcomes can be formulated as: long-term cooperation between the Herat University and the Slovak University of technology, improvement of the education process and the knowledge and skill of engineering graduates, improvement of knowledge and skill of the teachers of the Faculty of engineering of HU, and increase of the quality and safety of buildings which will be constructed in the region.

*Project duration:* from 2005 to 2007

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Rubber Research Institute Matador a.s. Púchov	Vulcanization conditions influencing the quality and economy of tire production	Klabník Miroslav, director, Terézie Vansovej 1054/45, 02032 Púchov	continually
VURUP, a.s., Vlčie hrdlo, Bratislava, Slovakia	cooperation	Mičíková, A., Ing., VURUP, a.s. Vlčie hrdlo, Bratislava, Slovakia	continually
NCHZ, a.s.	Engineering contracts	Čamaj, V. Goga V., NCHZ, a.s., Nováky	continually
EVPÚ, a.s.	Engineering contracts	A. Jurnečka, EVPÚ, a.s.	Since 2006
Liko Bratislava a.s.	Joint research projects	Minárik Martin, Ing., director, Wolkrova 4, Bratislava	Since 1994
Technical University Košice	Schlosser Š. co-supervisor of PhD students	Búgel M., assoc. professor, Technical University Košice	Since 2001
Institute of Chemistry of the Slovak Academy of Sciences	Joint research projects	Gemeiner, Peter, DrSc., researcher, Institute of Chemistry SAS, Dúbravská cesta 9, Bratislava	Since 1986
Institute of Polymers of the Slovak Academy of Sciences	Measurements of reverse micelles size by	Dr. D. Lath	Since 2006

Faculty of Mechanical Engineering STU	Heat exchanger for blood pasteurization	Ivan Morávek, researcher, Department of Production Systems, nam. Slobody 17, Bratislava	Since 2005
Liko Bratislava a.s.	Fermentation of 2-phenylethanol with in-situ extraction of product	Minárik Martin, Ing., director, Wolkrova 4, Bratislava	Since 2006
Liko Bratislava a.s.	Microbial production of gamma-decalactone	Vladimír Sitkey, Ing., PhD., Wolkrova 4, Bratislava	Since 2006
ProCS, s.r.o., Šaľa	Education in Chemical process equipment: Heat transfer equipment (exchangers and evaporators)	Bartošovič Štefan, Ing., director, Šaľa	Since 2007

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
ICPF AV ČR	cooperation	Drahoš, Jiri, professor, ICPF AV ČR	continually
TU VŠB, Praha, CR	cooperation	Wichterle, Kamil, professor, TU VŠB, Praha, CR	continually
Polimi, Milano, I	VIRRRTHUALIS, FP 6 project	Colombo, Simone, professor, Polimi, Milano, I	continually
University of Minho, Braga, P	ERASMUS	Jose A. Teixeira, professor, Department of Biological Engineering, University of Minho, 4710-057 Braga, Portugal	continually
University of Porto, P	ERASMUS	L. M. Madeira, professor	continually
Politehnica Bucurest	ERASMUS	V. Plesu, professor	Since 2006
Technical University Gdansk	ERASMUS	. B. Kawalec – Pietrenko, professor	Since 2006
University of Dortmund, D	common projects	A. Gorak, professor	Since 2001
Herat University	common projects	Dr. Naim Assad	Since 2005
VŠCHT Praha, ČR	scientific cooperation	Miloš Marek, professor VŠCHT Praha, CR	continually
CIBA Spezialitätenchemie AG, Basel, Switzerland	engineering contract	Krajník Paul, Global Head of Engineering, Spezialitätenchemie AG, Basel	Since 2001
Ege University, Izmir, Turkey	joint research project	Kabay Nalan, professor Ege University, Izmir	2005-2007
Technical University Wroclaw, PL	joint research project	Bryjak Marek, Dr., Technical University Wroclaw	2005-2007
Cytec, Canada	support in our research via sampling of ionic liquids	Robertson, Al-J., Cytec	Since 2004
Veszprém University Institute of Chemical and Process Engineering, Veszprém	Joint Slovak-Hungarian Bilateral Cooperation project "Hybrid processes for production of organic acids and their esters"	Belafi-Bako Katalin, Dr., Research Institute for Chemical and Process Engineering, H-8200 VeszprémEgyetem u. 2	Since 2007
Federal Agricultural Research Center, Braunschweig, Germany	Cooperation FP5 project	Vorlop Klaus, director, FAL Braunschweig, Germany	Since 2003
Institute National Polytechnique de Lorraine	cooperation in the study of adsorption for the water treatment	Görner Tatiana, Assoc. Prof., Laboratoire Environnement et Minéralurgie, CNRS UMR 7569, 15 avenue du Charmois BP 40, 54501 Vandoeuvre, France	Since 1999

Wroclaw Technical University	cooperation in the kinetics of starch enzyme action and enzyme inactivation kinetics	Bryjak Jolanta, Dr., researcher, Institute of Chemical Engineering ul. Norwida 4/6 50-373 Wroclaw, Poland	Since 1998
University of Strathclyde	collaboration in the application of laser light scattering in the investigation of enzyme inactivation	Šefčík, Ján, PhD., senior lecturer, Department of Chemical and Process Engineering, University of Strathclyde, Glasgow, Scotland	Since 2005
ETH Zürich	cooperation in FP6 project	Morbidelli Massimo, Professor, Head of the Group, Institut für Chemie- und Bioingenieurwissenschaften, ETH Hönggerberg, CH-8093 Zürich, Switzerland	Since 2003
Centre National de la Recherche Scientifique	cooperation FP6-project	Denoyel Renaud, Dr., researcher, Laboratoire Matériaux Divisés, Revêtements, Electrocéramiques (MADIREL), Centre de St Jérôme, 13397 Marseille, France	Since 2003
Sartorius Stedim Biotech	cooperation in membrane chromatography	Melzner Dieter, Dr., Weender Landstrasse 94-108, 37075 Göttingen, Germany	Since 2005
Veszprém University Institute of Chemical and Process Engineering, Veszprém	cooperation in the stability of lipase enzymes in ionic liquids	László Gubicza, Dr., Research Institute for Chemical and Process Engineering, H-8200 Veszprém Egyetem u. 2	Since 2004
ÚCHM, FCH, VUT Brno, ČR	cooperation in education	Havlica Jaromír, professor, dean FCH, Brno, CR	Since 2003
ÚFCH, VŠCHT, Praha, CR	cooperation	Matouš, Jaroslav, assoc. professor, UFCH, Praha, CR	continually
UPEI, FSI, VUT Brno	cooperation	Stehlik Petr, , professor, director of UPEI, VUT Brno, CR	continually

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Graciová Elena	Slovak Society of Chemical Engineering	member	1995
Steltenpohl Pavol	Slovak Society of Chemical Engineering	member	1995
Steltenpohl Pavol	Chemical Papers journal, Assistant Editor	other	2005
Illeová Viera	Slovak Society of Chemical Engineering	member	1998
Ačai Pavol	Slovak Society of Chemical Engineering	member	1998
Timár Pavel	Slovak Society of Chemical Engineering	secretary	1995
Markoš Jozef	Slovak Society of Chemical Engineering	chairman	1998
Markoš Jozef	VEGA commission "Chemistry and Chemical Technology"	member	2005
J. Haydary	Slovak Society of Chemical Engineering	member	1994
Jelemenský Ľudovít	Slovak Society of Chemical Engineering	member of Executive Board	1998
Stopka Ján	Slovak Society of Chemical Engineering	advisory board	2000

Vladimír Bálež	member of Executive Board	member of Executive Board	2002
Milan Polakovič	Slovak Society of Chemical Engineering	vichairman	2002
Milan Polakovič	Chemical Papers	Editor-in-Chief of	2005
Báleš Vladimír	Economy and Social Committee of Slovak Republic vice-president	other	2005
Báleš Vladimír	Slovak Rector Conference	president	2005
Steltenpohl Pavol	Chemical Papers journal, Assistant Editor	other	2005
Schlosser Štefan	Slovak Society of Chemical Engineering	member of Executive Board	1995
Štefuca Vladimír	Slovak Society of Chemical Engineering - member of advisory board	member of Executive Board	2000

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Markoš Jozef	Working party "Chemical Reaction Engineering" of EFCE	member	Since 2001
Stopka Ján	Working party "Education" of EFCE	member	Since 2002
Jelemenský Ľudovít	Working party „Loss prevention and safety“ of EFCE	member	Since 2004
Jelemenský Ľudovít	National konvent about EU - Working section III Environment	member	Since 2006
Báleš Vladimír	European Federation of Chemical Engineering	member of executive committee	Since 2002
Báleš Vladimír	Working Group on Bioreactor Performance of European Federation of Biotechnology	member	Since 1988
Schlosser Štefan	Working party Membranes of EFCE (delegate)	member	Since 1998
Schlosser Štefan	European Membrane Society	member	2005-2006
Schlosser, Štefan	Permea 2007 organizing committee	member	Since 2006
Schlosser Štefan	Ars Separatoria, Torun (PL), sci. committee of conference	member	Since 2005
Schlosser Štefan	Ars Separatoria Acta, Torun (PL), editorial board of journal	member	Since 2005
Polakovič Milan	Board of Section on Biochemical Engineering of European Federation of Biotechnology	member	Since 1999
Polakovič Milan	European Federation of Biotechnology, Section on Biochemical Engineering, Working Group on Biotransformations	chairman	Since 2004
Polakovič Milan	Scientific Committee of Section on Applied Biocatalysis of European Federation of Biotechnology	member	Since 1999
Schlosser Štefan	Member of the Scientific committee of the Congress CHISA in Prague, ( <a href="http://www.chisa.cz">www.chisa.cz</a> )	member	Since 1984
Jelemenský Ľudovít	National konvent about EU - Working section III Environment	member	Since 2006
Jelemenský Ľudovít	Member of the Scientific committee of the Congress CHISA in Prague, ( <a href="http://www.chisa.cz">www.chisa.cz</a> )	member	Since 2007
Jelemenský Ľudovít	Member of the Scientific committee of the ESCAPE18, ( <a href="http://www.escape18.org">www.escape18.org</a> )	member	Since 2007
Graciová Elena	Working party " Thermodynamics and Transport Properties " of EFCE	member	Since 2007

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
J. Hanika	ICPF AS CZ, Prague	Czech Republic	1 day
P. Dítl	Czech Technical University in Prague	Czech Republic	1 day
H. Dolores	University of Porto – ERASMUS	Portugal	4 months
A. Azimi	Herat University	Afganistan	3 months
N.G. Qader	Herat University	Afganistan	3 months
Bryjak Jolanta	Wroclaw Technical University, Institute of Chemical Engineering, Wroclaw	Poland	January / 1 week
Bryjak Jolanta	Wroclaw Technical University, Institute of Chemical Engineering, Wroclaw	Poland	December / 1 week
Bélafiné-Bakó K.	Veszprém University, Institute of Chemical Engineering, Veszprém	Hungary	October / 5 days
Fehér Erika	Veszprém University, Institute of Chemical Engineering, Veszprém	Hungary	October / 5 days
Vincze R.	Veszprém University, Institute of Chemical Engineering, Veszprém	Hungary	October / 5 days
Major B.	Veszprém University, Institute of Chemical Engineering, Veszprém	Hungary	October / 5 days

### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Markoš Jozef	Institute of Chemical Technology, Prague	Czech Republic	2 days
Markoš Jozef	ESCAPE 17, Bucharest	RO	5 days
Jelemenský Ľudovít	ESCAPE 17, Bucharest	RO	5 days
Švandová Zuzana	ESCAPE 17, Bucharest	RO	5 days
Labovský J.	ESCAPE 17, Bucharest	RO	5 days
Sláva Juraj	ESCAPE 17, Bucharest	RO	5 days
Jelemenský Ľudovít	12 <sup>th</sup> international symposium LP2007, Edinburgh	UK	4 days
Švandová Zuzana	12 <sup>th</sup> international symposium LP2007, Edinburgh	UK	4 days
Labovský J.	12 <sup>th</sup> international symposium LP2007, Edinburgh	UK	4 days
Kiša Michal	12 <sup>th</sup> international symposium LP2007, Edinburgh	UK	4 days
Sikula Ivan	ESCAPE 17, Bucharest	RO	5 days
Laššák Pavol	ESCAPE 17, Bucharest	RO	5 days
Markoš Jozef	ECCE 6, Copenhagen	DK	5 days
Kotora Marcel	ECCE 6, Copenhagen	DK	5 days
Sikula Ivan	ECCE 6, Copenhagen	DK	5 days
Sláva Jura	ECCE 6, Copenhagen	DK	5 days
Jelemenský Ľudovít	CHISA 2007, Srní – Šumava	CZ	5 days
Švandová Zuzana	CHISA 2007, Srní – Šumava	CZ	5 days
Labovský Juraj	CHISA 2007, Srní – Šumava	CZ	5 days
Sláva Juraj	CHISA 2007, Srní – Šumava	CZ	5 days
Laššák Pavol	CHISA 2007, Srní – Šumava	CZ	5 days
Kotora Marcel	CHISA 2007, Srní – Šumava	CZ	5 days
Sikula Ivan	CHISA 2007, Srní – Šumava	CZ	5 days
Koreňová Zuzana	CHISA 2007, Srní – Šumava	CZ	5 days
Variňny Miroslav	CHISA 2007, Srní – Šumava	CZ	5 days
Mierka Otto	CHISA 2007, Srní – Šumava	CZ	5 days
Haydary Juma	CHISA 2007, Srní – Šumava	CZ	5 days
Markoš Jozef	CHISA 2007, Srní – Šumava	CZ	5 days
Jelemenský Ľudovít	Polimi, Milano	I	2 days
Jelemenský Ľudovít	NTU, Athens	GR	3 days
Jelemenský Ľudovít	Kurchatov Institute, Moskva	RF	5 days
Jelemenský Ľudovít	BP, London	UK	2 days



Graczová Elena	Brno University of Technology, Faculty of Chemistry, Cooperation, Education in Chemical Engineering I, II	Czech Republic	40 days
Graczová Elena	Institute of Chemical Technology Prague, Faculty of Chemical Engineering, Department of Physical Chemistry, Prague Czech Republic	Czech Republic	2 days
Graczová Elena	Conference CHISA 2007, lecture	Czech Republic	4 days
Steltenpohl Pavol	Conference CHISA 2007, lecture	Czech Republic	4 days
Chlebovec Matúš	Conference CHISA 2007, lecture	Czech Republic	4 days
Schlosser Š.	Int. Workshop "Boron Removal from Seawater" at Ege University	Turkey	February/8 days
Schlosser Š.	Veszprém University, Institute of Chemical Engineering, Veszprém/joint project	Hungary	November/5 days
Illeová V.	Veszprém University, Institute of Chemical Engineering, Veszprém/joint project	Hungary	December/5 days
Marták J.	Veszprém University, Institute of Chemical Engineering, Veszprém/joint project	Hungary	December/5 days
Schlosser Š. Stopka J. Marták J. Blahušiak M.	PERMEA 2007	Hungary	September/5 days
Illeová Viera	University of Veszprém, Veszprém	Hungary	November / 5 days
Polakovič Milan	FP 6 Project meeting, Mainz	Germany	April / 3 days
Polakovič Milan	FP7 Workshop / Brussels	Belgium	January / 1 day
Polakovič Milan	FP7 Project meeting / Brussels	Belgium	December / 1 day
Polakovič Milan	7th International Conference on Protein Stabilization, Exeter	U.K.	April / 5 days
Polakovič Milan	Downstream Processing: What will be the next breakthrough? Delft	Netherlands	May / 3 days
Polakovič Milan	International Conference on Biopartitioning and Purification, Lisabon	Portugal	June / 6 days
Polakovič Milan	Wroclaw Institute of Technology	Poland	August/ 5 days
Vaňková Katarína	Downstream Processing: What will be the next breakthrough? Delft	Netherlands	May / 3 days
Wrzosek Katarzyna	International Conference on Biopartitioning and Purification, Lisabon	Portugal	June / 6 days
Tatárová Ivana	Downstream Processing: What will be the next breakthrough? Delft	Netherlands	May / 3 days
Gramblička Michal	International Conference on Biopartitioning and Purification, Lisabon	Portugal	June / 6 days

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Canev Michal	Analysis of energetic media management in real technological system	Otto Mierka
Dreveňák Peter	Analysis of energetic media management in real technological system	Otto Mierka
Špaňová Zuzana	Analysis of energetic media management in real technological system	Otto Mierka
Balogová Lucia	Analysis of energetic media management in real technological system	Otto Mierka
Kállay Dávid	Analysis of energetic media management in real technological system	Otto Mierka
Mihaľ Mario	Pre-concentration and separation of sacharids by extraction and pertaction using ionic liquids	Štefan Schlosser
Blahušiak Marek	Simulation of adsorption – micro filtration hybrid process for boron removal from water	Štefan Schlosser

Pinčiar Jakub	Computation of consequences of toxic, flammable and explosive compounds release	Zuzana Švandová
Moravčíková Mária	Using of Fire and Explosion index and Toxicity index in safety design of chemical equipments	Ľudovít Jelemenský
Gál Igor	Study of bioreactions catalyzed by immobilized enzymes	Vladimír Štefuca
Konečný Dušan	Simulation of industrial evaporator line	Pavel Timár

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Pidičák Štefan	CFD Modeling of Hazardous Gas Dispersion in Atmosphere	Ľudovít Jelemenský
Roschig Marian	The energy optimization of the separation line of the petrol fraction.	Eva Brunnerová
Variny Miroslav	Formation of Valine Microcrystals Through Rapid Antisolvent Precipitation	Otto Mierka
Starigazda Pavol	Modeling of aromats separation from light oil fraction reforming	Pavol Steltenpohl
Marčeková Nina.	Non-thermal effects of moderate electrical fields on food enzymes	Antonio Vicente, Milan Polakovič
Tavalayová Michaela	Optimisation of limekiln performance	Otto Mierka
Suchoň Tomáš	Optimization of reactor for ClO <sub>2</sub> production	Otto Mierka
Diko René	Study of extraction and pertraction of saccharides by ionic liquids	Štefan Schlosser
Sand Filip	Simulation primary distillation of oil	Juma Haydari
Csibriová Edina	Monitoring of entrainment of particles from fluidized-bed reactor in the production of polypropylene and its effect in the recycle system	Otto Mierka
Bazelová Zora	Study of dispersion of macromolecular solutes in chromatographic systems	Ján Stopka, Milan Polakovič
Kráľ Peter	Membrane separation of lignine from alcalic water from pulp washing system	Ján Stopka
Staho Tomáš	Study of thermal degradation of waste tires	Ľudovít Jelemenský
Schuller Lukáš	Measurements of axial dispersion coefficients in internal loop airlift reactors	Jaroslav Šefčík
Krok Alexander	CFD simulation for hazard identification in chemical equipment	Ján Stopka

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Antošová Monika	Study of separation of microbial transferases and their catalytic properties	Milan Polakovič
Marták Ján	New Types of Solvents and their Application in Two- and Three-Phase Contactors	Schlosser Štefan

## VIII. PUBLICATIONS

### Article in journal

- [1] Juma, M, Koreňová, Z., Markoš, J., Jelemenský, L., Bafrnec, M., Experimental Study of Pyrolysis and Combustion of Scrap Tyre, *Polymers for Advanced Technologies*, 18, (2006), pp. 144 – 148
- [2] Labovský, J., Švandová, Z., Markoš, J. and Jelemenský\*, L., Model-based HAZOP study of a real MTBE plant, *Journal of Loss Prevention in Process Industries*, 20 (2007), 230 – 237
- [3] Katora, M., Markoš, J., Čamaj, V., Design of the reactive distillation column for ecological decomposition of organic chloroderivatives in waste water, *Chemical Engineering Science*, 62 (2007) 5193 – 5197, doi: 10.1016/j.ces.2006.12.016
- [4] Sikula, I., Juraščík, M., Markoš, J., Modeling of the fermentation in the airlift bioreactor, *Chemical Engineering Science*, 62 (2007) 5216 – 5221, doi: 10.1016/j.ces.2007.01.050
- [5] Labovský, J., Švandová, Z., Markoš, J., Jelemenský, L., Mathematical model of chemical reactor – useful tool for its safety analysis and design, *Chemical Engineering Science*, 62 (2007) 4915 – 4919, doi: 10.1016/j.ces.2007.01.071
- [6] Juraščík, M., Sikula, I., Rosenberg, M., Markoš, J., Measurement of mass transfer coefficients in airlift reactors with internal loop using the glucose oxidase method, *Chemical and Biochemical Engineering Quarterly*, 21 (3), 2007: 207 - 212

- [7] Sláva, J., Švandová, Z., Markoš, J., Modelling of reactive separations including fast chemical reactions in CSTR, *Chemical Engineering Journal*, (2007), doi:10.1016/j.cej.2007.08.025
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### PhD thesis

- [1] Marták J.: New Types of Solvents and their Application in Two- and Three-Phase Contactors FChFT STU, Bratislava, SK, 2007. (Supervisor: Š. Schlosser)
- [2] Antošová, M.: Study of separation of microbial transferases and their catalytic properties. FChFT STU, Bratislava, SK, 2007. (Supervisor: Milan Polakovič)

### Miscellaneous

- [1] Jelemenský, L., Is it possible to use CFD modelling for emergency preparedness and response? NATO Workshop: Urban Structure Resilience under Multi – Hazard Threats: Lessons of 9/11 and Research Issues for Future Work, Moscow, July 2007, Invited lecture
- [2] Koreňová, Z., Haydary, J., Markoš, J., Jelemenský, L., Kinetic study of scrap rubber by TGA-DCS, STA 409 PC Luxx NETZSCH, Odborný seminár firmy NETZSCH Gerätebau GmbH – Thermal analysis theory and praxes, Brno, CZ, November 2007, Invited lecture
- [3] Kabay, N., Bryjak, M., Schlosser, Š., Yuksel, M., Kitis, M., Semiat, R., Al-Mutaz, I.: Study of the Adsorption-Membrane Filtration (Amf) Hybrid Process for Removal of Boron From Seawater, Final Report of the project MEDRC 04-AS-004. Izmir (TR), University of Ege, 192 p. 2007.
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## DEPARTMENT OF ENVIRONMENTAL ENGINEERING

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#### Technical staff:

Eleonóra Hornáčková; Marta Onderová;

### II. TEACHING AND RESEARCH LABORATORIES

#### A. Teaching laboratories:

Laboratory of Water Chemistry  
Laboratory of Nuclear Analytical Chemistry  
Laboratory of Water Technology

#### B. Research laboratories:

Laboratory of Air Protection Technology  
Laboratory of Microbiology and Ecotoxicology  
Laboratory of Organic Chemistry  
Laboratory of Radioecology  
Laboratory of Water and Wastewater Engineering  
Laboratory of Computer Modelling

### III. TEACHING

#### A. Undergraduate Study:

1. semester (Bc)	Ecology and Environmental Principles	2/0/0	Prousek,
2. semester (Bc)			
3. semester (Bc)	Environmental Engineering I.	2/0/0	Čík
5. semester (Bc)	Nuclear Chemistry and Technology	1/1/0	Koprda
6. semester (Bc)	Environmental Technology	2/0/0	Piatrik, Čík, Koprda
1. semester (MSc)	Biology of Water, Air and Soil	2/0/0	Frank
	Atmospheric and Water Chemistry	2/2/0	Prousek, Bodík
	Hydrology, Meteorology and Pedology	2/0/0	Frank
	Nuclear Chemistry and Technology	2/0/0	Koprda
	Laboratory Practice I.	0/0/8	Bodík, Földesová, Harangozó,
2. semester (MSc)	Air Protection Technology	2/0/0	Čík
	Radioecology	2/0/0	Harangozó,
	Processes and Technologies of Wastewater treatment	2/2/0	Derco, Drtil
	Laboratory Practice II.	0/0/8	Derco, Földesová, Čík
3. semester (MSc)	Risk Properties of Substances	2/0/0	Prousek,
	Elimination and Utilization of Wastes	2/0/0	Piatrik, Koprda

	Environmental Technological Project	2/1/0	Drtil, Derco
	Environmental Impact Assessment	2/0/0	Piatrik, Koprda
	Laboratory Practice III.	0/0/10	Drtil, Harangozó, Čík
	Control of Environmental Pollution	2/0/0	Harangozó
	Special Ecology and Ecotoxicology	2/0/0	Prousek
	Processes and Technology of Water Treatment	2/1/0	Hutňan, Bodík
	Air Protection Technology and Air Treatment	2/1/0	Čík
	Diploma Work	0/0/30	all members of the staff

#### IV. CURRENT RESEARCH PROJECTS

##### A. Part of the VEGA project No. 1/1379/04 Syntheses directed towards novel heterocyclic compounds with optoelectronic properties, specific biological activity and apoptosis (Gabriel Čík)

A new type of copolymer of alkylated oligomeric thiophene and polyethylene oxide was synthesized. The copolymer is soluble in common organic solvents and in solid state, which creates structurally-organized clusters composed of conducting (oligothiophenic) and non-conducting (PEO) segments. Separated thiophenic phase was confirmed by TEM, and localised fluorescence of the thiophenic clusters.

A new heterogenous photocatalyst was prepared by oxidative polymerization of the thiophene in the ZSM-5 zeolite type. The polythiophene absorb radiation in the visible range of the spectrum and by illumination with visible light generates reactive oxygen species (ROS) in water medium. Efficiency of the photocatalyst was tested on the killing of Gram-positive bacteria *Staphylococcus aureus* and Gram negative bacteria *Escherichia coli*.

Project duration: from 01.01.2004 to 31.12.2006

##### B. VEGA project No. 1/1381/04 The study of separation and isolation of metals and radionuclides from environmental components by natural and chemically modified sorbents (Vasil Koprda)

This project is focussed to select natural and modified sorbents having the best (structural, mechanical, physico-chemical and sorption) properties for waste water treatment, reduction of concentration of metals and radionuclides in waste waters and for a casual use as barriers against water or soil contamination at ecological incidents.

The project is aimed to research properties of ion exchangers and their modifications to improve removal, especially kations of heavy metals and radionuclides at waste water treatment. Concerning the high dose equivalents of  $Pb^{210}$  in human bones, the project is focussed as well for optimalisation of this heavy metal determination in mineral waters to assure the human limit of effective dose. The possibilities to affect transdermal penetration of radionuclides and/or tracer substances and their bioavailability are evaluated. The subject of the project is also the study of possibilities of limitation of effects at toxic wastes treatment in connection with introduction and improvement of the environmental management system.

Project duration: from 01.12.2004 to 31.12.2006

##### C. VEGA project No. 2/5051/25 The effects of antioxidants and substances affecting immunity system studied in vivo on model of adjuvant arthritis (Principal reasearcher Katarína Bauerová - IEP SAS, Vice-principal researcher for FChFT - Vasil Koprda)

The aim of the project is to research possibilities to influence a transport of drugs, drug and diagnostic substances through the skin and its components. In the case of harmful contaminants to search the possibilities of increasing the penetration barriers, and in the case of drugs to find out possibilities how to enhance the process of penetration. For this sake use both, in vitro and in vivo models. To define the share of transepidermal and transfollicular penetration. To study of markers transport across synthetic biomembranes.

In this project, using animal model of 5- and 9-day skin of new-born rat, model of human forearm and synthetic biomembranes of different composition, the transdermal and transfollicular transport of drugs, drug substances, radioactive markers and biogene substances across the skin and its components is researched. The possibilities to influence the penetration barriers are determined

Project duration: from 01.01.2005 to 31.12.2007



**D. VEGA Project No. 1/1382/04 Advanced methods for water, wastewater, sludge and organic wastes treatment (Ján Derco)**

Addition of silicate rocks in order to intensify processes of nutrient removal is insufficient and expensive. More convenient is performance of nitrification and denitrification processes in sludge water in separated reactor with activated sludge regeneration and phosphorus precipitation in sludge water after sludge stabilisation. Control of the second step of denitrification process is realistic but too complicated. More appropriate is to optimise denitrification process by using convenient external organic carbon source for complete denitrification with regard to actual costs. Anaerobic technology for treatment of corn silage was designed and process parameter values were determined. Parameter values obtained from laboratory investigation of treatment of organic solid wastes were used for design, construction and starting-up of full-scale station for biogas production. From results of testing of anaerobic-aerobic wastewater treatment technologies for small pollution sources followed satisfactory results in all pollution indicators. Anaerobic baffled reactor is convenient for degradation of hexamethylenetetramine. Increase of removal efficiency and biodegradability enhancement of biologically resistant and priority pollutants were achieved by oxidation with ozone and modified procedures of the Fenton reaction. Significant increase of treatment efficiency of the Fenton reaction was observed after addition of catechol and hydroquinone.

Project duration: from 01.01.2004 to 31.12.2006

**E. APVV project No. APVT-20-029804: Functional supramolecular surface nanostructure on the basis of cyclodextrins (Dušan Velič, Josef Prousek)**

J. Prousek participation: The study of the radical reactions influence on the stability of cyclodextrin and cyclodextrin's complexes. For this purpose the utilization of Fenton reaction has been tested as a source of reactive hydroxyl radicals.

Project duration: from 01.01.2005 to 31.12.2007

**F. APVV project No. APVV-20-000705 Rapid gas chromatography-mass spectrometry for analysis of selected organic pollutants in environmental and food matrices (Eva Matisová, Josef Prousek)**

J. Prousek participation: Evaluation of environmental estrogens with endocrine disruptor activity in environmental and food matrices. The utilization of different AOP processes for their degradation.

Project duration: from 01.01.2006 to 31.12.2008

**G. VEGA project No. VEGA 1/2462/05 Sensors of chemical toxicity - ascertaining of selected environmental chemical risk factors by the use of biosensors based on DNA and LDL (Ján Labuda, Josef Prousek)**

J. Prousek participation: The study of different antioxidant and prooxidant activity of some natural phenolic compounds by the use of Fenton reaction. Further, literature study of environmental pollutants with carcinogenic activity such are nitroaromatics and polyaromatic hydrocarbons, metals and chlorinated compounds.

Project duration: from 01.01.2005 to 31.12.2007

**H. Bilateral Slovak – Slovene Science and Technology Co-operation Project No. SK-SI-01506: Development of methodology for evaluation of biodegradability of wastewaters after oxidation treatment (Ján Derco)**

The main goal of the project is to set up appropriate methodology for evaluation of economically and ecologically applicable treatment methods by means of advanced chemical oxidation processes for heavily polluted industrial wastewaters as well as landfill leachates with low biotreatability potential. The chemical oxidation processes are studied as possible independent or pretreatment methods before biological treatment. The study will be conducted also with synthetic and actual wastewaters. Biotreatability of the wastewaters will be evaluated prior and after optimised chemical pretreatment using complex toxicity and biodegradability assessment. Those characteristics are considered as key summary factors for effective performance of biological wastewater treatment plant. It is expected that combination of both treatment methods will lead not only to pollution prevention but also to the overall cost management of related wastewater treatment plants. Methodology will gain knowledge on

wastewater treatment and it will improve understanding of behaviour of the heavily polluted persistent wastewaters.

Project duration: from 01.05.2006 to 01.05.2008

## V. CURRENT EDUCATION PROJECTS

### A. EU project. No MSCF-2005-029529 Postgraduate School of Industrial Ecology (PSIE) – activity Maria Curie Conferences and Training Courses (Gabriel Čík)

Postgraduate School will offer a set of 7 PhD-level research training courses in the period 2007-08. The aim of these courses is to develop the research skills and knowledge of early stage researchers in Industrial Ecology. PSIE targets PhD candidates, young researchers and faculty members from throughout Europe and beyond who want to address sustainable production and consumption in their research

Project duration: from 01.06.2006 to 30.06.2008

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Novácke chemické závody a.s.	Solving of Selected problems of wastewater treatment in NCHZ Novaky	Beňo, L. director	11.3.2005-
INA s.r.o. Skalica	Determination of cause of suspended solids creation in industrial wastewater of INA Skalica and design of technology for problem elimination	Hubinová M., kontakt persona	6.10.2005-
STIFI Zelená háj, Hurbanovo	Start-up and trial operation of biogas station	Štifner, Š. contact persona	20.10.2005-
Agrochemix, Sereď	Anaerobic treatment of G-phase, by-product of biodiesel production	P.Černý, director	01.04.2006-
Slovak Office of Standards, Metrol. and Test., Cyclotron Center of the SR, Bratislava	Applied radiation chemistry, production of positron radiopharmaceuticals	Ružička J., vicedirector	01.02.2000 -
ASIO-SK s.r.o.	Anaerobic-aerobic wastewater treatment	Kratochvíl, K., director, Malobyčianska ul., Bytča	01.01.1997 -
FELLEGI Int.	Anaerobic treatment processes	Fellegi, J., director, Na Hrebienku 38, Bratislava	01.03.2003 -
Slovak distilleries and liquories, Leopoldov	Evaluation of ethanol and acetic acid properties from point of view of possible effect to quality of ground and underground water	Miklovič, S., Slovenské liehovary a likéry a.s., Trnavská cesta, 920 41 Leopoldov	02.04.2004 - 16.04.2004
North-Slovak waterworks, Žilina	Possibility of odour elimination from sewerage in Sučany town	Kundrík, M., director, SVS a.s., Bôrická cesta 107, 010 10 Žilina	01.07.2004 - 31.7.2004
Ecological servis, ltd. Strážske	Study of WWTP operation from point of view of emission reduction	Kovaľ, E., director, Ekologické služby s.r.o., Priemyselná 720, 072 22 Strážske	17.09.2004 - 31.10.2005
Institute of Experimental Phytopathology and Entomology of the SAC	Radioecology	J.Kráľovič, L.Weismann, Slovak Academy of Science, Ivánka pri Dunaji	01.01.2002 -
Dep. of Chemistry, Matej Bel Univ., Banská Bystrica	Education studies in Environmental chemistry	Tólgýessy, J., Ružička, J., Cejpek, K., Matej Bel University, 974 01 Banská Bystrica	01.01.2001 -

Department of Analytical Chemistry, Faculty of Pharmacy, Comenius University	Environmental analytical chemistry	Havránek, Mlynská dolina, 824 15 Bratislava	01.01.2003 -
Podtatranská vodárenská spoločnosť a.s., Poprad	Evaluation of wastewater treatment plant Poprad and proposal of reconstruction	Svrbický Vladimír, director, Hraničná 662/17, 058 01 Poprad	01.10.2004 - 31.12.2005
Ministry of Environment SR, Department of Environmental Impact Assessment – EIA	Preparation of Register of Wastes, Preparation of Judgements about Wastes	Ing. V. Húsková, Head of Department	05.01.2004 – 20.12. 2005
Department of Ekology Faculty of Natural Sciences University of Mathias Bel. B. Bystrica	Education studies in environmental Sciences	PaedrDr. S. Vincíková, PhD., Head of Department	03.01.2004 – 20.12. 2005
CHEMZA a.s.	Applied Research Project	Ing. Michal Bočko, Chemza a.s., Priemyselná 720, 072 22 Strážske	1. 07. 2004 – 30. 09. 2005
REMAS Servis s.r.o.	Applied Research Project	Ing. Milan Gál, REMAS Servis s.r.o., Sekurisova 16, 841 02 Bratislava	11.10. 2004 -
Slovenská paroplynová spoločnosť a.s.	Applied Research Project	Ing. Ivan Krajčír, SPS a.s., Bystrická cesta 13, 034 17 Ružomberok	25. 06. 2004 -
Slovak Office of Standards, Metrol. and Test., Cyclotron Center of the SR, Bratislava	Applied radiation chemistry, production of positron radiopharmaceuticals and seed irradiation with gamma rays	Ružička J., vicedirector; Kassai Z., Dept.of positron emitters, Štefanovičova 3, 810 05 Bratislava	01.02.2000 -
Dep. of Nuclear Chemistry, Faculty of Natural Sci., Com. Univ., Bratislava	Education, Lecturing, Dep. of Nuclear Chemistry, Faculty of Natural Sci., Com. Univ., Bratislava	Mátel Ľubomír, head of depart., Mlynská dolina, 824 15 Bratislava	01.01.1992 -
Dep. of Chemistry, Matej Bel Univ., Banská Bystrica	Education studies in Environmental chemistry	Tomeček Otto, research worker,974 01 Banská Bystrica	01.01.2001 -
Water Research Institute, Bratislava	LSC measurements of radionuclides	Vršková Marta, head of dep., Nabr. L. Svobodu 5, 812 49 Bratislava	01.01.1996 -
Chemical Institute of Faculty of Natural Sciences of Comenius University, Bratislava	Analysis of dust particles	Krištín J., head of Dept. of Physical Methods, Mlynská dolina , 842 15 Bratislava	01.05.2002 -
Comenius University, Faculty of Pharmacy, Dpt. of Galenic Pharmacy, Bratislava	Penetration of Terbinafine across the skin	Duckova K., vicedean, ul.Odbojárov 10, 832 32 Bratislava	01.04.2002 -
Matej Bell University, Faculty of Natural Sciences, Dpt. of Environmental Chemistry	Cold electron radiation sterilisation	Tolgyessy J., Prof.emeritus, Tajovského 40, 97401 Banská Bystrica	01.06.2001 -
Institute of Experimental Pharmacology of Slovak Academy of Sciences, Bratislava	Transdermal penetration, animal skin models	Bauerová K., department. head, Dúbravská cesta 9, 842 16 Bratislava	01.02.1998 - 31.12.2005
Research Institute of Nuclear Power Stations, Trnava, Ltd., Dept. of RWPT	Nuclear wastes likvidation	Chnapko P., doctoral study, Okružná 5, 918 64 Trnava	01.08.2002 -
Nuclear Regulatory Authority of the Slovak Republic	Nuclear and radiation safety - Advisory Committee of the director	Žiakova M., director, Bajkalská 27, 820 07 Bratislava	01.05.1999 -
Pharmacobiochemical Lab., School of Medicine, Comenius Univ., Bratislava	Transdermal transportation of coenzyme Q10	Gvozdjakova M., department head, Kucharska J., Hlboká 2, 811 04 Bratislava	01.05.2003 -

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
ASIO, s.r.o., Brno, Czech Republic	Anaerobic and aerobic wastewater treatment, domestic wastewater	Plotěný, K., director, ASIO s.r.o, Tuřanka, Brno, Czech Republic	01.01.2004 -
GRANIT Technologies S.A. Lausanne, Swiss	Anaerobic and aerobic wastewater treatment, sludge stabilisation	Doppenberg, F., technical director, Lausanne, Swiss	01.12.2004 -
Cellulosa 2000, Crotone, Italy	Anaerobic and aerobic wastewater treatment, sludge stabilisation	Scichitano J., technical director, Crotone, Italy	01.01.2005 -
Institute of Chemical Technology, Prague, Czech Republic	Water and wastewater treatment, sludge treatment, nutrients removal, biogas production	Jeníček, P., department head, VŠCHT, Technická 6, Prague, Czech Republic	01.01.2004 - 31.12.2005
University of Ljubljana, Faculty of Chemistry and Chemical Technology	Science and Technology Cooperation	Dr. A. Žgajnar Govajn	01.05.2006-
ISMAL-CNR Milano	FP6-2002-NMP-1, Proposal: No STPR 001495 OSSO	Alberto Bolognesi, ISMAC-CNR Milano, Italy	01.06.2003 -
Faculty of Chemistry, Brno, Czech Republic	Lectures on Wastewater Engineering	Prof. Ing. Jaroslav Fiala, CSc., Faculty of Chemistry TU Brno, Purkyňova 118, 612 Brno, Czech Republic	16. 02.2005-30.06.2005
ART.BIO.FERM. s.r.o., Moravské Bránice, Czech Republic	Anaerobic treatment of wheat stillage	Krčmař, S., director, Moravské Bránice 59, 664 64 Dolní Kounice	15.05.2004 - 15.6.2004
Department of Chemistry, Yangon University, Yangon, Myanmar	Radiometric Flow Injection Analysis	Mynt U, head of department, Yangon University, Yangon, Myanmar	01.01.1990 -
Medway Sciences Univ. of Greenwich	Transdermal penetration of pharmacologically active substances across skin	Hadgraft J.-head of Skin research, Central Ave., Chatham Maritime, Kent ME4 4TB, UK	01.02.1995 -

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Bodík Igor	Association of Wastewater Treatment Experts of the Slovak Republic	member of advisory board	13.05.1999 -
Bodík Igor	Global Water Partnership Slovakia	member of advisory board	20.04.2005 -
Čík Gabriel	Slovak Chemical Society	member	01.01.1991
Drtíl Miloslav	Association of Wastewater Treatment Experts of the Slovak Republic	president	13.05.1999 -
Derco Ján	Association of Wastewater Treatment Experts of the Slovak Republic	member of advisory board	13.05.1999 -
Derco Ján	Slovak Society of Chemical Engineering	member	29.09.1995 -
Derco Ján	Slovak Chemical Society	member	01.05.1997 -
Derco Ján	Common Field Committee -28-95-9 Chemistry and Technology of Environment	member	18.12.1997 -
Derco Ján	Common Field Committee - 36-05-9 Sanitary-technical buildings	member	02.12.2003 -
Derco Ján	Common Field Committee - Chemistry and Technology of Environment Protection	member	11.04.2006
Derco Ján	Common Field Committee - 4.3.2. Environmental Engineering	member	11.04.2006
Derco Ján	Acta Facultatis Ecologiae	member of advisory board	30.11.2006
Harangozó Margita	Slovak Chemical Society, Bratislava	member	15.2.1986
Harangozó Margita	Slovak Pharmaceutical Society, Bratislava	member	28.10.1994
Hutňan Miroslav	Slovak Society of Chemical Engineering	member of advisory board	30.04.1995 -

Hutňan Miroslav	Association of Wastewater Treatment Experts of the Slovak Republic	member	13.05.1999 -
Koprda Vasil	Slovak Nuclear Society (SNUS Acad. Board)	president	01.01.2000 -
Koprda Vasil	Slovak Chemical Society, Bratislava	member	01.01.1965 -
Koprda Vasil	Slovak Medical Society, Pharm.Soc	member	01.01.1977 -
Prousek Josef	Slovak Chemical Society	member	01.01.1979 -
Patrik Milan	Faculty of Natural Sciences University of Mathias Bel in Banská Bystrica	Science Council member	03.01.2004 -

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Bodík Igor	International Water Association	member	01.01.1990 -
Bodík Igor	Journal Vodní hospodářství - Water management	other	01.01.2004 -
Bodík Igor	Association of Wastewater Treatment Experts in Czech Republic	member	01.05.1997 -
Derco Ján	International Water Association	member	01.01.1994 -
Derco Ján	Association of Wastewater Treatment Experts in Czech Republic	member	01.05.1997 -
Derco Ján	Management Committee of the International Water Association (IWA) Specialist Group on Pretreatment of Industrial Wastewaters	member	07.03.2006
Derco Ján	Journal of Polish Environmental Study	other	01.04.1995 -
Derco Ján	Council of European Water Association	member	15.07.2002 -
Derco Ján	Common Field Committee - Chemistry and Technology of Environment Protection - Faculty of Chemistry TU, Brno	member	01.02.2003 -
Čík Gabriel	European Photochemical Association, Mulheim, Germany	member	01.01.1992
Drtíl Miloslav	Association of Wastewater Treatment Experts of the Czech republic	member of advisory board	01.01.1994 -
Prousek Josef	Czech Chemical Society	member	01.05.1979 -
Prousek Josef	European Photochemical Association	member	01.01.1986 -
Patrik Milan	Czech Science Foundation – GACR, Prague	member	03.01.2004 -
Koprda Vasil	FECS Division for Chemistry and Environment - delegate for Slovakia	member of advisory board	01.04.2002 -
Hutňan Miroslav	Association of Wastewater Treatment Experts in Czech Republic	member	01.05.1997 -

#### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Žgajnar Gotvajn, A.	University of Ljubljana, Ljubljana	Slovenia	25. 9. – 21.10.2006 (27 days)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Almásiová, B.	University of Ljubljana	Slovenia	December 2006 (5 days)
Bodík, I.	World Water Days in Stockholm	Sweden	August 2006 (7 days)
Bodík, I.	Conference Waste and Sludge 2006	Czech republic	June 2006 (2 days)

Bodík, I.	Advisory board Vodní hospodářství	Czech Republic	June 2006 (1 day)
Derco, J.	University of Cagliari	Sardinia, Italy	May 2006 (10 days)
Derco, J.	State Examination, VUT Brno	Czech Republic	June 2006 (2 days)
Derco, J.	CHISA 2006 Conference, Prague	Czech Republic	August 2006 (5 days)
Derco, J.	University of Ljubljana	Slovenia	September 2006 (5 days)
Drtíl, M.	Institute of Chemistry and Technology Prag	Czech Republic	June 2005 (3 days)
Drtíl, M.	Conference Wastes and Sludges 2006	Czech Republic	June 2006 (3 days)
Drtíl, M.	Cooperation on Wastewater Treatment Processes, VUT Brno	Czech republic	October 2006 (3 days)
Hutňan, M.	Excursion on Biogas Station in Germany	Germany	April 2006 (6 days)
Hutňan, M.	Institute of Chemistry and Technology Prag	Czech Republic	February 2006 (2 days)
Hutňan, M.	Institute of Chemistry and Technology Prag	Czech Republic	June 2006 (2 days)
Hutňan, M.	Conference Wastes and Sludges 2006	Czech Republic	June 2006 (3 days)
Koprda, V.	Conf. Perspectives of Percutaneous Penetration, La Grande Motte	France	April 2006 (5 days)
Koprda, V.	Conf. Europa Uomo na ECPC Master Class, Milano	Italy	May 2006 (2 days)
Koprda, V.	United against Cancer, 06, Ljubljana,	Slovenia	November 2006 (2 days)
Koprda, V.	Internat. Congres on Oncology, Znojmo,	Czech Republic	November 2006 (3 days)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Krausková, A.	The Treatment of RAW in Slovakia	Koprda, V.
Sobkovčiková, Z.	The Back-Part of the Fuel Cycle of Nuclear Power Stations	Koprda, V.
Kulichová, Z.	The Potential of Non-Fossil Fuel Sources	Koprda, V.
Tričko, T.	The Perspectives of Bioenergetic Sources of Energy	Koprda, V.
Sedláček, S.	Mamebrane biological wastewater treatment	Bodík, I.
Rybář, M.	Organic Sources of Carbon for Denitrification	Bodík, I.
Kltonová, M.	Transformation of surplus activated sludge by ozone	Derco, J.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Almásiová B.	Utilisation of ozone for decreasing of surplus activated sludge production.	Derco, J.
Pagáčová, P.	Wastewater treatment plant in Volkswagen Bratislava	Bodík, I.
Ševčík, P.	Preparation and Properties of Modified Catalyst Based on Titanium Dioxide	Čík, G.
Blišťáková, A.	Industrial wastewater treatment with nutrient removal	Drtíl, M.
Hajósová, L.	Parameters in biological wastewater treatment with nutrient removal	Drtíl, M.
Kostrová, Z.	The comparation of zeolite sorption properties with other natural sorbents	Földesová, M.
Gergelyová P	The influence of pH and concentration on the sorption properties of natural and modified zeolites.	Földesová, M.

Behrová, J.	Photochemical reductive dehalogenation of chlorinated environmental pollutants by the use of zero-valent iron	Prousek, J.
Ferenceiová, M.	Estimation of Polonium-210 by LSS in the mineral waters	Harangozó, M.

## VIII. PUBLICATIONS

### Chapter or pages in book

- [1] Bodík, I.: Sustainable Sanitation in Central and Eastern Europe – Addressing the Needs of Small and Medium-size Settlements. Chapter in Bodík I., Ridderstolpe P. (Eds.): Sustainable Sanitation in Central and Eastern Europe. Global Water Partnership 2007, p.28, ISBN 978-80-969745-0-4, 2007
- [2] Bodík, I.: Udržiteľná sanitace v zemích střední a východní Evropy – vstříc potřebám malých a středních sídel (Czech version). Chapter in Bodík I., Ridderstolpe P. (Eds.): Udržateľná sanitace v zemích střední a východní Evropy. Global Water Partnership 2007, p.28, ISBN 978-80-969745-1-1, 2007
- [3] Bodík, I.: Ilgtspējīga sanitārija centrālajā un austrumeiropā – pievēršoties mazo un vidēja lieluma apdzīvoto vietu vajadzībām (Latvian version). Chapter in Bodík I., Ridderstolpe P. (Eds.): Ilgtspējīga sanitārija centralajā un Austrumeiropā. Global Water Partnership 2007, p.28, ISBN 978-80-969745-2-8, 2007
- [4] Bodík, I.: Situația prezentă privind alimentarea cu apă și sanitația în țările GWP CEE (Romanian version). Chapter in Bodík I., Ridderstolpe P. (Eds.): Sanitația Durabilă în Europa Centrală și de Est Global Water Partnership 2007, p.28, ISBN 978-80-969745-3-5, 2007
- [5] Földesová, M., Dillinger, P.: Štúdium povrchov a sorpčných a vlastností prírodných sorbentov, Elektronická kniha-multimediálne CD : Minulosť a súčasné trendy jadrovej chémie (eds. Mátel L., Kuruc J.), www.omegainfo.sk, 2007

### Article in journal

- [1] Bodík, I.: Možnosti a perspektívy decentralizovaného čistenia odpadových vôd.VODA-elektronický odborný časopis (www.e-voda.cz), vol. 3 no. 1, pp. 1-4, 2007
- [2] Bugár, I., Žitňan, M., Velič, D., Čík, G., Chorvát, D.: Fluorescence study of intrachain ultrafast processes in domain-structured polythiophene. Synthetic Metals 157, pp. 834-840, 2007
- [3] Bodík, I., Gašpariková, E., Dančová, L., Kalina, A., Drtil, M., Hutňan, M.: Influence of disinfectants on domestic wastewater treatment plant performance. Bioresources Technology, No. 99, pp. 532-539, 2007
- [4] Čík, G., Dlháň, L., Šeršeň, F., Rapta, P.: Study of the influence of structural hysteresis on polaron interactions of lightly doped poly(3-dodecylthiophene) with FeCl<sub>3</sub>. Synthetic Metals 157, pp. 807-812, 2007
- [5] Dančová, L., Bodík, I., Blišťáková, A., Polesňák, M., Plotěný, K.: Skúsenosti z dvojročnej prevádzky domovej ČOV s membránovou filtráciou. Vodní hospodářství, vol. 57, no. 12, pp. 422-425, 2007
- [6] Drtil, M., Fiala, M., Tlodka, J., Pagáčová, P., Blišťáková, A.: Dynamické riadenie odstraňovania dusíka a kontrola procesu aktivácie pomocou merania signálu ORP a pH. Vodní hospodářství, vol. 57, no. 3, pp. 96-99, 2007
- [7] Földesová, M., Hudec, P., Dillinger, P.: Chemically modified zeolites : surfaces and interaction with Cs and Co. Petroleum and Coal (www.vurup.sk/pc), vol. 49, no. 2, pp.63-66, 2007
- [8] Földesová, M., Hudec, P.: Štúdium povrchových vlastností slovenského zeolitu – klinoptilolitu fyzikálnou adsorpciou dusíka. Petroleum and Coal (www.vurup.sk/pc), vol. 49, no. 1, pp. 34-40, 2007
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- [10] Gajdoš, L., Pietrelli, L., Cicarello, A., Derco, J.: Elimination of polyethylene glycol from aqueous solution using activated carbon and ozonation. Polish J. Environ. Studies, vol. 16, no. 3, pp. 285-388, 2007
- [11] Hutňan, M., Kalina, A., Štíflner, Š.: Bioplynová stanica na spracovanie cielene pestovaných poľnohospodárskych plodín. Agrobioenergia, vol. 2, no. 3, pp. 5-8, 2007
- [12] Jakubčová, Z., Derco, J., Almásiová, B.: Využitie ozónu na znižovanie produkcie prebytočného kalu. Vodní hospodářství, vol. 57, no. 6, pp. 215-216, 2007
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### Technical staff:

Monika Cepeková; Andrea Kalmárová; Stanislav Vagač;

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Process Control  
Laboratory of Control Systems  
Laboratory of Measuring Instruments and Techniques  
Computer Laboratory (PC - Windows, Linux)  
Computer Laboratory (Solaris)

### B. Research laboratories:

Laboratory of Control Theory  
Laboratory of Modelling and Simulation  
Laboratory of Identification  
Laboratory of Optimisation  
Laboratory of Neural Networks  
Laboratory of Fuzzy Control and Expert Systems  
Laboratory of Chemical Reactor Analysis and Control  
Laboratory of Biochemical Process Analysis and Control  
Laboratory of Distillation Column Analysis and Control  
Laboratory of Computer Aided Design (Siemens – SIMATIC S-7 300, FOXBORO, Yokogawa)

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Informatics	1/0/2	Blahová, Hirmajer, Čižniar, Podmajerský, Vasičkaninová, Závacká
<b>2. semester (Bc)</b>	Computer Based Data Processing	0/0/2	Čirka, Karšaiová, Vaneková
	Optimisation	3/3/0	Dvoran, Hirmajer, Líška, Vasičkaninová
<b>4. semester (Bc)</b>	Operating systems	1/2/0	Fikar, Herceg
	Modelling	2/3/0	Bakošová, Karšaiová, Vasičkaninová, Závacká
<b>5. semester (Bc)</b>	Computer Based Data Processing	0/0/2	Vasičkaninová

	Process Control	2/0/0	Bakošová
	Laboratory Exercises of Process Control	0/0/2	Bakošová, Karšaiová, Vasičkaninová
	Design of control and information systems	2/3/0	Čirka, Kvasnica, Vaneková
<b>6. semester (Bc)</b>	Automatic Control Fundamentals	2/0/0	Bakošová, Fikar
	Laboratory Exercises of Automatic Control Fundamentals	0/0/2	Bakošová, Karšaiová, Líška, Vasičkaninová, Puna, Závacká
	Bachelor projects	0/0/4	Herceg, Hirmajer, Puna, Vaneková
<b>1. semester (MSc)</b>	Process Control	1/0/2	Bakošová, Karšaiová
	Process Dynamics	2/0/0	Bakošová
	Operating Systems	1/0/1	Fikar
	Control Devices and Systems	2/0/1	Kvasnica
	Computer Programs	1/0/2	Čirka
	Laboratory Project I	0/0/8	Bakošová, Čížniar, Karšaiová, Čirka
<b>2. semester (MSc)</b>	Optimisation	2/0/1	Dvoran
	Control Theory I	2/0/2	Čirka, Mikleš
	Laboratory Exercises of Control Theory I	0/0/2	Mikleš
	Experimental Identification	2/0/0	Fikar
	Laboratory Project II	0/0/6	Čirka, Danko, Dvoran, Vaneková
	Modelling and Control of Polymerisation Processes	2/0/2	Dvoran
<b>3. semester (MSc)</b>	Control Theory II	2/0/0	Mészáros
	Laboratory Exercises of Control Theory II	0/0/2	Mészáros
	Intelligent Control Systems	2/0/0	Dvoran
	Semestral Project	0/0/8	Čirka, Dvoran, Karšaiová, Vaneková
	CAD systems	2/0/0	Karšaiová
	Industrial Applications of Process Control	2/0/0	Vaneková
	Control of Technological Processes	1/0/2	Bakošová, Vasičkaninová
	Robust Control	2/0/0	Fikar
<b>4. semester (MSc)</b>	Diploma Theses	0/0/27	Bakošová, Čirka, Fikar, Mikleš, Vaneková, Vasičkaninová

#### IV. CURRENT RESEARCH PROJECTS

##### **VEGA Project No 1/4055/07: Advanced Approaches to Control of Chemical and Biochemical Processes with Uncertainties (M. Bakošová)**

The project deals with development of advanced approaches to control of systems with uncertainties and focuses on processes typical for chemical and food technologies, as e.g. chemical reactors, biochemical reactors, distillation columns, and others. Development of methods of robust analysis, robust stabilization and robust control of systems with uncertainties constitutes the core of the project. Processes with recycle can be also included to the systems with uncertainties. Designed algorithms, controllers, and control structures will be tested by simulations and in laboratory conditions. Obtained results will be transferred to the industrial praxis.

Project duration: from 01.01.2007 to 31.12.2009

##### **VEGA Project No 1/3081/06 Optimisation and control of chemical and biochemical processes (Miroslav Fikar)**

The project deals with development of modern control and optimisation methods and focuses into processes typical in chemical and food industries: chemical reactors, distillation columns, waste-water treatment plants, and others. Involves static and dynamic, and global optimisation methods, predictive control as well as supervisory control. Developed algorithms, controllers, and control structures will be tested by simulations and in laboratory conditions.

Project duration: from 01.01.2006 to 31.12.2008

### **Project of French National Science Foundation Polynomial optimisation of complex systems ECO-NET (Miroslav Fikar)**

The project investigates the possibility to use the newest results in polynomial methods and linear matrix inequalities developed in LAAS-CNRS Toulouse for solution of various problems: robust control (CTU Prague), control of chaotic systems (ITIA Prague), predictive control (STU Bratislava), nonlinear control (IMPRES, Sankt Peterburg). The cooperation enables to spread the field of applications and the partners become familiar with the latest progress in theoretical and practical aspects of polynomial optimisation.

Project duration: from 01.01.2006 to 31.12.2007

### **Project of Slovak – Czech Scientific Cooperation No SK-CZ 11206 Progressive robust and adaptive control methods for processes with heat and mass transfer (Monika Bakošová)**

The project deals with development of progressive approaches to control of systems with uncertainties and focuses on processes with heat and mass transfer typical for chemical and food technologies, as e.g. distillation columns, heat exchangers, chemical reactors and others. Development of methods of robust analysis, robust stabilization and robust control of systems with uncertainties constitutes the core of the project. Modern adaptive control methods are investigated as well. Designed algorithms and control structures are tested by simulations and on laboratory processes.

Project duration: from 01.01.2006 to 31.12.2007

### **Project of Slovak – Czech Scientific Cooperation No SK-CZ 11106 Advanced control methods for processes of chemical and food technologies (Miroslav Fikar)**

The aim of the project is to develop advanced methods for control and optimisation of processes in chemical and food technology, e.g. chemical reactors, distillation columns, sludge processes, etc. Methods of dynamic and global optimisation, predictive control and multistage control design are investigated. Developed control algorithms, controllers and control structures are tested by simulations and in laboratory conditions.

Project duration: from 01.01.2006 to 31.12.2007

### **Project of Slovak – Hungarian Scientific Cooperation No SK-MAD-0001-06: Modelling, Optimisation, and Control of Heat and Mass Transfer Processes (M. Fikar)**

With regard to ongoing research projects at the two partner departments, 3 research areas can be selected for future scientific collaboration. They are: Chemical Process Modelling and Control, Integrated Process Design, Hybrid Separation Process Design.

Project duration: from 01.01.2007 to 31.12.2008

## **V. CURRENT EDUCATION PROJECTS**

### **KEGA Project No 3/3121/05 Network of virtual laboratories for control of real systems (Miroslav Fikar)**

The aim of the project is to create an open network of virtual laboratories in Slovakia connected together via Internet and to laboratory networks abroad. The project will also implement and test properties of centralised network managed by an educational portal and distributed network created from servers on the participants' laboratories.

Project duration: from 1.1.2005 to 31.12.2007

### **ESF Project No 13120110014 Program of continuing education in industrial automation and information technologies (Miroslav Fikar)**

The aim of the project is to realize various courses in industrial automation and information technologies for support of employment.

Project duration: from 1.1.2005 to 31.12.2006

**ESF Project Development of human resources for research in the field of automation (Miroslav Fikar)**

The main aim of the project is to improve quality of employment of Bratislava region using development of human resources in research. Project should enforce regional research in automation, to create and develop learning society and network connected to national and international communities, to transfer the newest knowledge from academia to industry, and to increase awareness of enterprises about the research potential in the region.

Project duration: from 1.10.2004 to 31.12.2006

**ESF Project No 13120200115: PhD students for modern industrial automation in Slovak Republic (M. Fikar)**

The main aim of the project is to improve quality of employment and competitiveness of Bratislava region via development of education and support of PhD students and young researchers. The project is focused on industrial automation, current and prospective industrial parks and institutions not only in the target region but in the whole Slovakia as well. Education is targeted to motivation of PhD students in modern automation in automotive, process, biotechnological, and energetical industries. The main aspect is to make possible to study at the most advanced institutions in Europe including not only universities but industries as well.

Project duration: from 1.1.2007 to 31.12.2009

**ESF Project No 11230220525 and No 13120120287: Preparation of university teachers for ICT in education (M. Fikar)**

Project aims:

- To improve quality of university teachers in Slovakia via two mirror projects.
- To provide ECDL certificate of university teachers in presence and distance learning using new elearning technologies so that they will be able to modernise teaching process.
- Later, to provide such possibility to a wider community to improve qualification structure in Slovakia.
- To increase skills of university teachers in e-learning with focus on LMS systems and pedagogical aspects of modern education.
- To create a permanent consultancy services and help desks in ICT.

Project duration: from 1.1.2006 to 31.12.2008

**VI. COOPERATION**

**A. Cooperation in Slovakia**

Institution	Type of cooperation	Responsible person	Duration
ProCS, Ltd., Šaľa	Education in process dynamic and control	Bartošovič Štefan, director, Kráľovská 8, Šaľa	01.12.2006 -
Institute of Control and Industrial Informatics, FEEIT STU, Bratislava	Education in information technologies and automatic control.	Huba Mikuláš, associate professor, Ilkovičova 3, Bratislava	01.06.2004 -
Department of Cybernetics and Artificial Intelligence, FEEI TU, Košice			
Department of Management and Control Engineering, BERG Faculty TU, Košice			
Siemens, Inc., Bratislava			
Invensys, Inc., Slovakia			
Department of Automation, Informatics and Instrumentation, FME STU, Bratislava	Education in information technologies and automatic control.	Rohal'-Ilkiv Boris, professor, Nám. Slobody 17, Bratislava	01.06.2004 -

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Department of Process Control and Computer Techniques, FCT, University of Pardubice, Czech Republic	Advanced control methods for processes of chemical and food technologies.	Taufer Ivan, professor, Nám. Čs. legií 565, Pardubice, Czech Republic	01.01.2000 -
LSGC-CNRS, Ecole Nationale Supérieure des Industries Chimiques (ENSIC), Nancy, France	Dynamic optimisation of distillation columns, wastewater treatment plants.	Latifi Mohamed Abderrazak, professor, 1 rue Grandville, Nancy, France	01.01.1997 -
Ecole Nationale Supérieure des Ingénieurs de Génie Chimique-Chemin de la Loge (ensigc), Toulouse, France	polynomial methods	Didier Henrion, professor, 7 avenue du Colonel Roche, Toulouse, France	01.01.2006 -
Control Engineering Laboratory, FEIS, Ruhr University, Bochum, Germany	Closed-loop identification, predictive control.	Unbehauen Heinz, professor, Universitätstr. 150, Bochum, Germany	01.01.1998 -
Control Engineering Laboratory, FEIS, Ruhr University, Bochum, Germany	E-learning in control.	Schmid Christian, professor, Universitätstr. 150, Bochum, Germany	01.01.2003 -
Institute of Information Technologies, Tomas Bata University, Zlín, Czech Republic	Adaptive control, decentralized control.	Dostál Petr, professor, Nám. T. G. Masaryka 275, Zlín, Czech Republic	01.01.1998 -
Institute of Information Technologies, Tomas Bata University, Zlín, Czech Republic	Adaptive control, robust control.	Prokop Roman, professor, Nám. T. G. Masaryka 275, Zlín, Czech Republic	01.01.1998 -
Department of Chemical Engineering, University of Technology and Economics, Budapest, Hungary	Modelling of chemical processes,	Mizsey Peter, professor, Mülgzetem rkp. 3, Budapest, Hungary	01.01.1996 -
Department of Computing and Control Engineering, Institute of Chemical Technology, Prague, Czech Republic	Control of Biochemical processes		
Institute of Information Theory and Automation of the Academy of Sciences of the Czech Republic, Prague, Czech Republic	Polynomial methods		
Faculty of Electrical Engineering, Czech Technical University, Prague, Czech Republic	Adaptive control, polynomial synthesis.	Šebek Michael, Technická 2, Prague, Czech Republic	01.01.1998 -

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Bakošová Monika	Slovak Society of Chemical Engineering		03.05.1995 -
Dvoran Ján	Slovak Society of Chemical Engineering		03.05.1995 -
Mészáros Alojz	Slovak Society of Chemical Engineering		03.05.1995 -
Mikleš Ján	Slovak Society of Chemical Engineering		03.05.1995 -
Dvoran Ján	Slovak Society for Cybernetics and Informatics		01.01.1992 -
Mikleš Ján	Slovak Society for Cybernetics and Informatics		01.01.1992 -
Mészáros Alojz	Slovak Society for Cybernetics and Informatics		01.01.1992 -
Bakošová Monika	Slovak Society of Industrial Chemistry		01.01.1983 -
Čírka Ľuboš	Slovak Society of Industrial Chemistry		01.01.1998 -
Danko Ján	Slovak Society of Industrial Chemistry		01.01.1975 -
Dvoran Ján	Slovak Society of Industrial Chemistry		01.01.1975 -
Fikar Miroslav	Slovak Society of Industrial Chemistry		01.01.1990 -
Karšaiová Mária	Slovak Society of Industrial Chemistry		01.01.1975 -
Mészáros Alojz	Slovak Society of Industrial Chemistry		01.01.1981 -
Mikleš Ján	Slovak Society of Industrial Chemistry		01.01.1975 -
Vasičkaninová Anna	Slovak Society of Industrial Chemistry		01.01.1985 -

Dermíšek Lukáš	Slovak Society of Industrial Chemistry		01.01.2003 -
Mikleš Ján	Scientific Grant Agency VEGA MŠSR a SAV - Commission for Electrotechnics and Informatics		30.04.2002 -
Mikleš Ján	Commission for defense of dissertations (DSc) at science 28-30-9 Chemical Engineering and Process Control		01.11.1998 -
Mikleš Ján	Commission for defense of dissertations (DSc) at science 38-01-9 Automation and Control		01.01.1998 -
Mikleš Ján	Common branch commission for PhD study at science 28-30-9 Chemical Engineering and Process Control	vice-chairman	01.01.1998 -
Bakošová Monika	Common branch commission for PhD study at science 28-30-9 Chemical Engineering and Process Control		02.12.2003 -
Danko Ján	Common branch commission for PhD study at science 28-30-9 Chemical Engineering and Process Control		01.01.1998 -
Dvoran Ján	Common branch commission for PhD study at science 28-30-9 Chemical Engineering and Process Control		01.01.1998 -
Fikar Miroslav	Common branch commission for PhD study at science 28-30-9 Chemical Engineering and Process Control		02.12.2003 -
Mészáros Alojz	Common branch commission for PhD study at science 28-30-9 Chemical Engineering and Process Control		01.01.1998 -
Mikleš Ján	Common branch commission for PhD study at science 38-01-9 Automation and Control		09.09.1997 -
Bakošová Monika	Common branch commission for the field of study 5.2.14 Automation		01.03.2005 -
Dvoran Ján	Common branch commission for the field of study 5.2.14 Automation		01.03.2005 -
Fikar Miroslav	Common branch commission for the field of study 5.2.14 Automation		01.03.2005 -
Mészáros Alojz	Common branch commission for the field of study 5.2.14 Automation		01.03.2005 -
Mikleš Ján	Common branch commission for the field of study 5.2.14 Automation		01.03.2005 -
Mikleš Ján	Editorial board of AT&P Journal		01.01.1993 -
Dvoran Ján	Editorial board of AT&P Journal		01.01.1993 -
Mészáros Alojz	Editorial board of AT&P Journal		01.01.1993 -
Mikleš Ján	Editorial board of Cybernetics and Informatics		01.01.1993 -

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Mikleš Ján	International Federation of Automatic Control, Technical Committee on Control Design		01.01.1996 -
Mikleš Ján	International Federation of Automatic Control (IFAC), Slovak National Member Organisation (Slovak NMO)		01.01.1997 -
Bakošová Monika	Czech Society of Chemical Engineering	member	01.01.2000 -
Mészáros Alojz	Czech Society of Chemical Engineering	member	01.01.2000 -
Mészáros Alojz	The New York Academy of Sciences	member	01.01.1996 -
Mészáros Alojz	Public Board of the Hungarian Academy of Sciences	member	01.01.2004 -
Mészáros Alojz	European Federation of Biotechnology	member	01.01.1997 -
Fikar Miroslav	EUCA (European Union Control Association) Council	member	01.12.2005 -

#### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Honc, D.	University of Pardubice, Pardubice	Czech Republic	June 2007 (5 days)



Dušek, F.	University of Pardubice, Pardubice	Czech Republic	June 2007 (5 days)
Škrabánek, P.	Faculty of Technology, University of Pardubice, Pardubice	Czech Republic	June 2007 (30 days)
Rozsival, P.	Faculty of Technology, University of Pardubice, Pardubice	Czech Republic	June 2007 (30 days)
Prokop, R.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	September 2007 (5 days)
Dlapa, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	October 2007 (5 days)
Cvejn, J.	University of Pardubice, Pardubice	Czech Republic	October 2007 (5 days)
Kvasnicová, E.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	October 2007 (5 days)
Taufer, I.	Faculty of Technology, University of Pardubice, Pardubice	Czech Republic	October 2007 (5 days)
Taufer, I.	Faculty of Technology, University of Pardubice, Pardubice	Czech Republic	May 2007 (20 days)
Matušů, R.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	November 2007 (6 days)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Vaneková, K.	Course of LMI, Prague	Czech Republic	January 2007 (8 days)
Puna, D.	Course of LMI, Prague	Czech Republic	January 2007 (8 days)
Závacká, J.	Course of LMI, Prague	Czech Republic	January 2007 (8 days)
Herceg, M.	Course of LMI, Prague	Czech Republic	January 2007 (8 days)
Fikar, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	February 2007 (1 day)
Čížniar, M.	ENSIC – INPL, Nancy	France	March – September 2007 (180 days)
Fikar, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	April (1 day)
Čírka, L.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	April (1 day)
Fikar, M.	Lab. Automatique, EFPL, Lausanne	Switzerland	May (4 days)
Fikar, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	May (1 day)
Fikar, M.	European Union Control Association, Kos	Greece	June 2007 (5 days)
Fikar, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	June 2007 (4 days)
Bakošová, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	June 2007 (4 days)
Dvoran, J.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	June 2007 (3 days)
Herceg, M.	Warsaw University, Warsaw	Poland	June – July 2007 (5 days)
Puna, D.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	June 2007 (1 day)
Bakošová, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	June 2007 (2 days)
Dvoran, J.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	June 2007 (2 days)
Herceg, M.	Hycon PhD School of Hybrid systems, Siena	Italy	July 2007 (6 days)
Puna, D.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	July 2007 (9 day)
Puna, D.	LAAS CNRS, Toulouse	France	July – October (72 days)

Hirmajer, T.	Spanish Council for Scientific Research, Vigo	Spain	August – October 2007 (67 days)
Mikleš, J.	Principia Cybernetica 2007, Prague	Czech Republic	September (3 days)
Fikar, M.	Principia Cybernetica 2007, Prague	Czech Republic	September (3 days)
Bakošová, M.	European Congress of Chemical Engineering-6, Kodaň	Denmark	September (6 days)
Mészáros, A.	TU Budapest, Veszprém	Hungary	October (3 days)
Fikar, M.	University of Hradec Králové, Hradec Králové	Czech Republic	November (3 days)
Čírka, L.	Technical Computing Prague 2007, Prague	Czech Republic	November (1 day)
Kvasnica, M.	Technical Computing Prague 2007, Prague	Czech Republic	November (1 day)
Kvasnica, M.	Automatic Control Laboratory, ETH Zürich	Switzerland	November (7 days)
Bakošová, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	November (1 day)
Mikleš, J.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	November (2 days)
Mészáros, A.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	November (1 day)
Fikar, M.	Faculty of Applied Informatics, Tomas Bata University, Zlín	Czech Republic	November (1 day)
Kvasnica, M.	University of Pardubice, Pardubice	Czech Republic	November (2 days)
Čírka, L.	University of Pardubice, Pardubice	Czech Republic	November (2 days)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Briš, M.	Control by industrial control system SIMATIC.	Bakošová, M.
Zahradník, M.	Control by industrial control system SIMATIC	Vaneková, K.
Zubček, M.	Development of GUI for chemical reactor visualization.	Puna, D.
Schmidt, S.	Using of the MPT toolbox in linear optimal control.	Herceg, M.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Szúcsová, A.	Adaptive network based fuzzy inference systems (ANFIS)	Vasičkaninová, A.
Juhásová, E.	A learning unit for a thermofluid process.	Čírka, L.
Súkenníková, E.	A toolbox for unit testing in MATLAB.	Kvasnica, M.
Blaňár, P.	Computer Control of Liquid Storage Systems.	Mikleš, J.
Madzin, T.	Control by industrial control system Foxboro.	Vaneková, K.
Bihuňová, M.	Control of time-delay systems	Bakošová, M.
Čemanová, L.	Development of the GUI for controller synthesis.	Bakošová, M.
Podmajerský, M.	Estimation of process parameters from measured data.	Fikar, M.
Dovař, P.	E-learning Module for Experimental Identification.	Čírka, L.
Vlkanová, J.	Fuzzy model predictive control.	Vasičkaninová, A.
Minarovský, P.	Implementation of a terminal server in student laboratories.	Fikar, M.
Zábojníková, K.	Internet module for process modelling and simulation.	Bakošová, M.
Jančová, K.	Robust control of a laboratory process.	Bakošová, M.

### C. Graduate Theses (PhD Degree) for state examinations after three years of study

Name	Title of Thesis	Head of Board
Hirmajer, T.	Dynamic Optimization of Hybrid Processes.	Fikar, M.

## VIII. PUBLICATIONS

### Books

- [1] Huba, M., Bisták, P., Fikar, M.: Learning Management Systems, (in Slovak) Slovak e-Academy, Bratislava, 118 pages, 2007.
- [2] Huba, M., Bisták, P., Fikar, M.: Authors of e-learning, (in Slovak) Slovak e-Academy, Bratislava, 204 pages, 2007.
- [3] Mikleš, J., Fikar, M.: Process Modelling, Identification, and Control, Springer Verlag, Berlin Heidelberg, 2007.
- [4] Fikar, M.: Dynamic Optimisation of Processes, (in Slovak) STU Bratislava and Slovak e-Academy, Bratislava, 2007.

### Chapter or pages in book

- [1] Bakošová, M., Puna, D.: Selected Topics in Modelling and Control, Editor(s): Mikleš, J., Veselý, V., Chapter: Control of a Continuous-Time Stirred Tank Reactor via Robust Static Output Feedback. Slovak University of Technology Press, vol. 5, pp. 38-44, 2007.
- [2] Čirka, L., Fikar, M.: Selected Topics in Modelling and Control, Editor(s): Mikleš, J., Veselý, V., Chapter: A Dynamical System Identification Toolbox. Slovak University of Technology Press, vol. 5, pp. 58-62, 2007.
- [3] Čirka, L., Fikar, M., Mikleš, J.: Selected Topics in Modelling and Control, Editor(s): Mikleš, J., Veselý, V., Chapter: Youla-Kučera Parameterisation Approach to LQ Tracking and Disturbance Rejection Problem. Slovak University of Technology Press, vol. 5, pp. 8-12, 2007.
- [4] Čižniar, M., Fikar, M., Latifi, M. A.: Selected Topics in Modelling and Control, Editor(s): Mikleš, J., Veselý, V., Chapter: A Matlab Package for Dynamic Optimisation of Processes. Slovak University of Technology Press, vol. 5, pp. 52-57, 2007.
- [5] Herceg, M., Fikar, M.: Selected Topics in Modelling and Control, Editor(s): Mikleš, J., Veselý, V., Chapter: Constrained Predictive Control of a Laboratory Servoengine. Slovak University of Technology Press, vol. 5, pp. 115-120, 2007.
- [6] Hirmajer, T., Fikar, M.: Selected Topics in Modelling and Control, Editor(s): Mikleš, J., Veselý, V., Chapter: Open-Loop Optimal Control of a Hybrid System. Slovak University of Technology Press, vol. 5, pp. 45-51, 2007.
- [7] Vasičkaninová, M., Bakošová, M.: Selected Topics in Modelling and Control, Editor(s): Mikleš, J., Veselý, V., Chapter: Fuzzy Logic Control of a Chemical Reactor With Disturbances. Slovak University of Technology Press, vol. 5, pp. 121-126, 2007.

### Article in journal

- [1] Čirka, L., Fikar, M.: A Toolbox for Recursive Identification of Dynamical Systems. AT&P Journal PLUS 2, pp. 44-47, 2007.
- [2] Herceg, M., Kvasnica, M., Čirka, L., Fikar, M.: Real-Time Predictive Control of a Servo Engine. AT&P Journal PLUS 2, pp. 124-130, 2007.
- [3] Herceg, M., Kvasnica, M., Fikar, M.: Stabilizing Predictive Control of Fuzzy Systems Described by Takagi-Sugeno Models. AT&P Journal PLUS 2, pp. 105-111, 2007.
- [4] Hirmajer, T., Čižniar, M., Fikar, M.: Application of a dynamic optimization method to solve optimal control problems. AT&P Journal PLUS 2, pp. 57-62, 2007.
- [5] Puna, D., Bakošová, M.: Algorithms for robust controller design: application to CSTR. AT&P Journal PLUS 2, pp. 79-83, 2007.
- [6] Závacká, J., Bakošová, M., Vaneková, K.: Control of systems with parametric uncertainties using a robust PI controller. AT&P Journal PLUS 2, pp. 84-87, 2007.

### Article in conference proceedings

- [1] Augustín, I.: LMS, an Application for E-learning in Physics. In collection of annotations. Student competition STOČ'2007, VŠB - Technical University Ostrava, 2007.
- [2] Bakošová, M.: LMS Moodle in the Course Control of Technological Processes. Editor(s): Huba, M., In Proc. of 8th International Conference Virtual university 2007, Bratislava, pp. 171-175, 2007.
- [3] Bakošová, M.: LMS Moodle in the Course Control of Technological Processes. Editor(s): Huba, M., In Proc. of 8th International Conference Virtual university 2007, Bratislava, pp. 171-175, 2007.
- [4] Bakošová, M., Fikar, M., Čirka, L.: E-learning in Process Control Education. In Proceedings of European Congress of Chemical Engineering (ECCE-6), Copenhagen, pp. CDR0M 1015.pdf, 2007.

- [5] Bakošová, M., Puna, D.: Algorithms for Robust Controller Design: Application to CSTR. Editor(s): J. Mikleš, M. Fikar, M. Kvasnica, In Proc. 16. Int. Conference Process Control '07, Štrbské Pleso, High Tatras, Slovakia, (lecture: Puna), pp. 026f.pdf, 2007.
- [6] Bakošová, M., Puna, D., Závacká, J.: Robust stabilization of an exothermic CSTR. In Proceedings of European Congress of Chemical Engineering (ECCE-6), Copenhagen, pp. CDR0M 990.pdf, 2007.
- [7] Christophersen, F.J., Kvasnica, M., Jones, C.N., Morari, M.: Efficient Evaluation of Piecewise Control Laws defined over a Large Number of Polyhedra. Editor(s): S. G. Tzafestas, P. J. Antsaklis, In Proc. of of the European Control Conference 2007, pp. 2360-2367, 2007.
- [8] Dovál, P., Čírka, L., Fikar, M.: EXPID - Experimental Identification Toolbox. In 15th Annual Conference Proceedings, KANAG - TISK, Praha, Kongresové centrum ČVUT Praha, pp. 38-38, 2007.
- [9] Čírka, L., Bakošová, M., Fikar, M., Herceg, M.: Dynamic Simulations of Chemical Processes via the MATLAB Web Server. In 15th Annual Conference Proceedings, KANAG - TISK, Praha, Kongresové centrum ČVUT Praha, pp. 34-34, 2007.
- [10] Čírka, L., Fikar, M.: LMS Moodle - Random Assignment. Editor(s): Huba, M., In Proc. of 8th International Conference Virtual university 2007, Bratislava, pp. 168-170, 2007.
- [11] Čírka, L., Fikar, M.: A Dynamical System Identification Toolbox. Editor(s): J. Mikleš, M. Fikar, M. Kvasnica, In Proc. 16. Int. Conference Process Control '07, Štrbské Pleso, High Tatras, Slovakia, pp. 001f.pdf, 2007.
- [12] Čírka, L., Fikar, M., Kvasnica, M.: Real-Time Adaptive Control of a Laboratory Fan Heater Using the Youla-Kučera Parameterisation. Editor(s): Fikar, M., Kolesárová, A., Bakošová, M., In Proceedings IAM 2007 - workshop on informatics, automation and mathematics, STU Press, pp. 99-110, 2007.
- [13] Čírka, L., Fikar, M., Kvasnica, M., Herceg, M.: New Features in Course on Experimental Identification. Editor(s): Huba, M., In Proc. of 8th International Conference Virtual university 2007, Bratislava, pp. 182-187, 2007.
- [14] Fikar, M., Čírka, L., Bakošová, M., Hirmajer, T.: Automatic Generation of Assignments and Quizzes in Control Engineering Education. Editor(s): S. G. Tzafestas, P. J. Antsaklis, In Proc. of the European Control Conference 2007, pp. 2714-2720, 2007.
- [15] Fikar, M., Čírka, L., Bakošová, M., Hirmajer, T.: Automatic Generation of Quizzes in MATLAB. Editor(s): J. Mikleš, M. Fikar, M. Kvasnica, In Proc. 16. Int. Conference Process Control '07, Štrbské Pleso, High Tatras, Slovakia, pp. 184f.pdf, 2007.
- [16] Fikar, M., Čírka, L., Katuščák, S., Tiňo, R.: Information Technologies for the Project KNIHA.SK. Editor(s): Tiňo, R., Vizárová, K., Reháková, M., In Wood, Pulp and Paper 2007, Slovak University of Technology in Bratislava, pp. 5-6, 2007.
- [17] Fikar, M., Čírka, L., Katuščák, S., Tiňo, R.: Information Technologies for the Project KNIHA.SK. Editor(s): J. Mikleš, M. Fikar, M. Kvasnica, In Proc. 16. Int. Conference Process Control '07, Štrbské Pleso, High Tatras, Slovakia, pp. 237f.pdf, 2007.
- [18] Herceg, M., Kvasnica, M., Čírka, L., Fikar, M.: Real-time Predictive Control of a Servo Engine. Editor(s): J. Mikleš, M. Fikar, M. Kvasnica, In Proceedings of the 16th Int. Conf. on Process Control, pp. 222f.pdf, 2007.
- [19] Herceg, M., Kvasnica, M., Fikar, M.: Transformation of Fuzzy Takagi-Sugeno Models into Piecewise Affine Models. Editor(s): Kryszkiewicz, M.; Peters, J.F.; Rybinski, H.; Skowron, A., In Rough Sets and Intelligent Systems Paradigms, Proceedings, Springer, Warsaw, Poland, vol. 4585, pp. 211-220, 2007.
- [20] Herceg, M., Kvasnica, M., Fikar, M.: Stabilizing Predictive Control of Fuzzy Systems Described by Takagi-Sugeno Models. Editor(s): J. Mikleš, M. Fikar, M. Kvasnica, In Proceedings of the 16th Int. Conf. on Process Control, pp. 223f.pdf, 2007.
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- [29] Mikleš, Ján: Process Dynamics and Optimal Control. In Proc. 8th International Carpathian Control Conference, High Tatras, (Plenary Lecture), 2007.
- [30] Paulen, R.: Control of Time-delay Systems. In collection of annotations. Student competition STOČ'2007, VŠB - Technical University Ostrava, 2007.
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- [33] Puna, Dalibor, Bakošová, Monika: ROBUST PI CONTROLLER DESIGN FOR A CSTR WITH UNCERTAINTIES. Editor(s): Markoš, J., Štefuca, V., In Proc. 34th International Conference of Slovak Society of Chemical Engineering, SSCHE Bratislava, Tatranské Matliare, Slovakia, pp. CDROM 043p, 2007.
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- [35] Vaneková, K., Bakošová, M., Závacká, J.: Robust Control of A Laboratory Process Using Control System SIMATIC. Editor(s): J. Markoš and V. Štefuca, In Proc. 34th International Conference of Slovak Society of Chemical Engineering, Tatranské Matliare, Slovakia, pp. 061p.pdf, 2007.
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- [41] Závacká, J., Bakošová, M., Vaneková, K.: Control of Systems with Parametric Uncertainties Using a Robust PI Controller. Editor(s): Fikar, M., Kolesárová, A., Bakošová, M., In Proceedings IAM 2007 - workshop on informatics, automation and mathematics, STU Press, pp. 84-91, 2007.
- [42] Závacká, J., Bakošová, M., Vaneková, K.: Robust PI Controller Design for Control of Systems with Parametric Uncertainties. Editor(s): J. Markoš and V. Štefuca, In Proc. 34th International Conference of Slovak Society of Chemical Engineering, Tatranské Matliare, Slovakia, pp. 038p.pdf, 2007.
- [43] Závacká, J., Bakošová, M., Vaneková, K.: Control of a System with Parametric Uncertainties Using a Robust PI Controller. Editor(s): J. Mikleš, M. Fikar, M. Kvasnica, In Proc. 16. Int. Conference Process Control '07, Štrbské Pleso, High Tatras, Slovakia, pp. 027f.pdf, 2007.

### **Phd's thesis**

- [1] Hirmajer, T.: Dynamic Optimization of Hybrid Processes. Department of Information Engineering and Process Control, FCHPT STU, Radlinského 9, 812 37 Bratislava, Slovak Republic, 2007. (Supervisor: Prof. Dr. Ing. Miroslav Fikar)

### **Technical manual**

- [1] Fikar, M.: On Automatic Generation of Quizzes using MATLAB and XML in Control Engineering Education. Radlinského 9, 812 37 Bratislava 1, Slovak Republic, 2007.
- [2] Hirmajer, T., Fikar, M.: Solution of Dynamic Optimization Problems with Sensitivity Equations Approach. FCFT STU, Radlinského 9, 812 37 Bratislava, Slovakia, 2007.
- [3] Hirmajer, T., Fikar, M., Balsa-Canto, E., Banga, J. R.: DOTcyp: Dynamic Optimization Toolbox with Control Vector Parameterization approach. Radlinského 9, 812 37 Bratislava 1, Slovak Republic, (Available at: [www.kirp.chf.stuba.sk/~hirmajer/dotcyp.html](http://www.kirp.chf.stuba.sk/~hirmajer/dotcyp.html)), 2007.

## DEPARTMENT OF MATHEMATICS

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### PhD Students:

Štefan Babinec, Ing., Peter Grančič, Ing., Dagmar Zelisková, Ing.

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory equipped by personal computers for the Basics of Computer Science

B. Research laboratories:

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Calculus I	2/3/0	Šabo, Horanská, Jasem, Fabrici, Boor Kolesárová, Baláž, Bánki, Garaj, Mazák
	Calculus I (external study)	2/2/0	Kolesárová, Jasem
	Informatics	1/0/2	Antoni, Boor
	Informatics (external study)	1/0/2	Bánki
	Informatics and algorithms	2/0/1	Babinec, Kvasnička, Bánki
	Informatics and algorithms (external study)	2/0/1	Babinec
<b>2. semester (Bc)</b>	Calculus II	4/4/0	Kolesárová, Horanská, Jasem, Šabo, Fabrici, Baláž, Bánki, Garaj, Hainzlová
	Calculus II (external study)	2/2/0	Kolesárová, Jasem
	Programming I	1/0/2	Pospíchal, Antoni, Babinec, Boor
	Programming I (external study)	1/0/2	Pospíchal, Babinec
<b>3. semester (Bc)</b>	Applied Statistics	1/0/1	Varga, Garaj
	Applied Statistics (external study)	1/0/1	Varga
	Calculus III	1/0/1	Baláž
	Calculus III (external study)	1/0/1	Baláž, Horanská
	Programming II	1/0/2	Pospíchal, Antoni, Babinec
	Programming II (external study)	1/0/2	Pospíchal, Babinec
<b>4. semester (Bc)</b>	Applied Statistics	1/0/1	Varga
<b>5. semester (Bc)</b>	Calculus III	2/0/2	Garaj, Varga
	Calculus III (external study)	1/0/1	Garaj
<b>2. semester (MSc)</b>	Numerical mathematics in chemistry	0/0/3	Šabo
<b>3. semester (MSc)</b>	Statistics	2/0/1	Varga
	Laboratory of specialization II	0/0/6	Boor
	Financial mathematics	2/0/0	Horanská
<b>4. semester (MSc)</b>	Diploma thesis	0/0/27	Varga, Kolesárová, Horanská, Šabo

## IV. CURRENT RESEARCH PROJECTS

### Conjunctive aggregation operators VEGA GRANT No. 1/3012/06 (Anna Kolesárová)

Aggregation is an important process in any sphere of life where it is necessary to obtain from a given input information a single output value representing the input data. In many areas, e.g., in knowledge-based systems, multi-criteria decision making, applications in fuzzy set theory, etc., various types of numerical aggregation operators are needed. We are interested in conjunctive types of aggregation operators, especially triangular norms, which are associative conjunctive operators, important, e.g., in fuzzy logics; copulas and quasi-copulas, which are types of conjunctive 1-Lipschitz aggregation operators, not necessarily associative, playing an important role in probability theory and statistics. We focus our attention on the construction of such operators or their best possible bounds from partial information on subdomains and on the problem of dominance of triangular norms. The aim of the project is also to propose methods for identification of copulas from observed data and application of the obtained results for investigation of the dependence structure of more dimensional random variables.

Project duration: from 01/01/2006 to 31/12/2008

### Many valued logics in expert systems VEGA GRANT No. 1/ 2005/05 (Michal Šabo)

Many valued logics allow to use vague and uncertain human knowledge expressed in natural language in decision processing. Preference modelling, fuzzy modelling, multicriteria decision making, utilisation of neural network, prediction of time series, fuzzy regression models are important parts of many valued inference processes. These projects face many problems for solution of which can be used the classical knowledge from mathematical analysis, discrete mathematics, graph theory, theoretical computer science. Such problems are, e.g., problems of convenience of fuzzy connectives, existence of preference structures, domination of operators, similarities of objects. Applications of the results of this project can be expected in many-valued inference modelling, fuzzy analysis, topology, chemical technology, energetics, management etc. Some theoretical results can enrich the classical set theory and mathematical analysis.

Project duration: from 01/2005 to 12/2007

### Predictions in Neural Networks and Regression models Project Kniha SK (Štefan Varga)

Predictions in neural networks and regression models is a partial theme that we have solved in the project Kniha SK (co-ordinator Svetozár Katuščák, ODCP). The aim of the project is the study of modern methods of predictions of discrete and continuous random variables and random vectors. In the field of regression analysis our interest is oriented to the logistic regression models, where the output variable is qualitative and to the nonparametric regression, where the regression model for the output variable is unknown. The problem in the both studied parts of regression analysis is to predict the output variables. Another problem is to compare these predictions with the predictions acquired using the neural networks.

Project duration: from 01/01/2006 to 31/12/2007

## V. CURRENT EDUCATION PROJECTS

### VI. COOPERATION

#### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
SjF STU Bratislava	E-learning in mathematics	Mgr. M. Kováčová, PhD.	2007-2008
SAV Bratislava	Scientific cooperation in Number Theory	Doc. O. Strauch, Doc.S. Jakubec	2007-2009
FMFI UK Bratislava	Scientific cooperation in Theory of Real function	Prof. P. Kostyrko	2007-2009
SvF STU	Scientific cooperation - Theory of aggregation functions and multi-criteria decision making	Prof. RNDr. R. Mesiar, DrSc.	2006-

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
J. Kepler University, Linz	Scientific cooperation - Theory of aggregation functions	Prof. E.P. Klement	2007
Universita di Lecce, Italy	Scientific cooperation in Statistics	Prof. C. Sempi	2007
J. Kepler University, Linz	Scientific cooperation - Theory of copulas	Prof. E.P. Klement, Dr. F. Durante	2007
University of Gent, Belgium	Scientific cooperation - Theory of aggregation functions	Prof. B. De Baets	2007
University of Alcalá, Spain	Scientific cooperation - Theory of aggregation functions	Prof. T. Calvo	2007
FFP UO, Opava	Organization of a seminar on Artificial Life and Cognition	Prof. RNDr. J. Kelemen, DrSc.	1.5.2000-
University J. Monnet, St. Etienne	Scientific cooperation	Prof. G. Grekos	2007-2008
University de Provence, CMI, Marseille	Scientific cooperation in Uniform Distribution Theory	Prof. P. Liardet	2006-2007
Prírodoved. Fak. OU Ostrava	ERASMUS	Doc. L. Mišík, CSc	2006-2007
Pedagog. Fak. OU Ostrava	ERASMUS	Doc. J. Kostra, CSc	2006-2007
Univ. Luminy, Marseille de Provence IMP	Scientific cooperation	Prof. H. Favvre	2007-2008

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Kvasnička Vladimír	Slovak Academic Society	member	1997
Kvasnička Vladimír	Slovak Artificial Intelligence Society	chairmann	29.8.2000-
Kvasnička Vladimír	Slovak Computer Science Society	member	1.1.1996-
Kvasnička Vladimír	Slovak Society for Mathematicians and Physicists	member	1980-1992
Kvasnička Vladimír	Scientific Commity of FCHPT STU	member	1.9.2002-
Kvasnička Vladimír	Scientific Commity of FIIT STU	member	1.10.2003-
Kvasnička Vladimír	Joint Commission for PhD study in Applied Informatics	member	1.1.1998-
Kvasnička Vladimír	Joint Commission for PhD study in Artificial Intelligence	member	1.1.2000-
Šabo Michal	Joint Commission for PhD study in Applied Mathematics	member	1.1.1998-
Kvasnička Vladimír	Commission for defence of DrSc. dissertations in Chemical Physics	member	1.1.1998-
Garaj Ivan	Technical commission TK71 Applications of statistical methods in quality control	member	1.1.2003
Garaj Ivan	Committee of Slovak Statistical and Demographic Society	member	1.1.2000
Kolesárová Anna	Slovak Society for Mathematicians and Physicists	member	1974-
Kolesárová Anna	Editorial Board of Tatra Mountains Math. Publ.	member	1998
Šabo Michal	Slovak Society for Mathematicians and Physicists	member	1968-
Pospíchal Jiří	Slovak Computer Science Society	member	1.1.1996-
Pospíchal Jiří	Slovak Artificial Science Society	member	29.8.2000-
Antoni Jozef	Slovak Society for Mathematicians and Physicists	member	1968-
Baláž Vladimír	Slovak Society for Mathematicians and Physicists	member	1978-
Baláž Vladimír	Slovak Mathematical Society	Member	1996-
Jasem Milan	Slovak Society for Mathematicians and Physicists	member	1978-
Varga Štefan	Slovak Society for Mathematicians and Physicists	member	1968-
Horanská Ľubomíra	Slovak Society for Mathematicians and Physicists	member	1993-

## D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Kvasnička Vladimír	MATCH Communications in Mathematical Chemistry	member of advisory board	1.1.1998 -



Kvasnička Vladimír	Neural Network World	member of advisory board	1.1.2001 -
Kvasnička Vladimír	Croatica Chimica Acta	member of advisory board	1.1.2002 -
Kolesárová Anna	European Society for Fuzzy Logic and Technology (EUSFLAT)	member	1998-
Šabo Michal	European Society for Fuzzy Logic and Technology (EUSFLAT)	member	1998-
Šabo Michal	SEFI - Mathematical Working Group	member	1994-
Sarkoci Peter	European Society for Fuzzy Logic and Technology (EUSFLAT)	member	2005-
Baláž Vladimír	Editorial Board of Uniform Distribution Theory	manager editor	2005-
Pospíchal Jiří	EURO Working group on fuzzy sets (EUROFUSE) ( <a href="http://allserv.rug.ac.be/~bdebaets/members.html#SlovakRepublic">http://allserv.rug.ac.be/~bdebaets/members.html#SlovakRepublic</a> )	member	1999-

### E. Visitors from abroad

### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Varga Štefan	Prírodoved. Fak. OU Ostrava , ERASMUS	Czech Republik	July 2007, 14 days
Kolesárová Anna	J.Kepler University, Linz, 28th Linz Seminar	Austria	February 5-10, 2008
Kolesárová Anna	Internat. Conference EUSFLAT'2007, Ostrava	Czech Republik	September 10-15, 2008
Kolesárová Anna	Internat. Summer School AGOP'2007, Ghent	Belgium	July 8-15, 2008
Šabo Michal	Internat. Conference EUSFLAT'2007, Ostrava	Czech Republik	September 10-15, 2008
Baláž Vladimír	Prírodoved. Fak. OU Ostrava , ERASMUS	Czech Republik	July 2007, 14 days
Baláž Vladimír	Internat. Workshop Sequences, Ostrava	Czech Republik	September 2-9, 2007
Babinec Štefan	INEB - Instituto de Engenharia Biomédica	Portugal	September 9-14, 2007
Jasem Milan	University of Klagenfurt, Internat. Workshop on General Algebra	Austria	February 1-4, 2007

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Hladíková M.	Predictions in regression models and neural networks	Varga Š.
Horváthová I.	Predictions in fuzzy regression models	Varga Š.
Jančík M.	Intelligent technologies in education	Kolesárová A.
Kovalčík B.	Application of many valued logic in fuzzy control	Šabo M.
Krář M.	Evaluation of financial derivatives by Black-Scholes method	Horanská L.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
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Babinec Štefan	Using ECHO state neural networks for time series prediction	Pospíchal J. Prof., DSc.
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## VIII. PUBLICATIONS

### Article in journal

- [1] BABINEC, Š.: Use of autoregressive predictor in Echo state neural networks. Computing and Informatics. - ISSN 1335-9150. - Vol. 26, No. 6 (2007), p. 649-661. (in English)
- [2] BABINEC, Š., POSPÍCHAL, J.: Improving the prediction accuracy of Echo state neural networks by anti-Oja's learning. Lecture Notes in Computer Science. s Vol. 4668 (2007) p. 19-28. (in English)
- [3] BABINEC, Š., POSPÍCHAL, J.: Optimization of Echo State Neural Networks for Electrical Load Forecasting. In: Neural network world. - ISSN 1210-0552. - Vol. 17, Iss. 2 (2007), p. 133-152. (in English)
- [4] DURANTE, F., KOLESÁROVÁ, A., MESIAR, R., SEMPI, C.: Copulas with given diagonal sections: novel constructions and applications. In: International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems. - ISSN 0218-4885. - Vol. 15, No. 4 (2007), p. 397-410. (in English)
- [5] DURANTE, F., KOLESÁROVÁ, A., MESIAR, R., SEMPI, C.: Copulas with given values on a horizontal and a vertical section. In: Kybernetika. - ISSN 0023-5954. - Vol. 43, No. 2 (2007), p. 209-220. (in English)
- [6] GARAJ, I.: Aproximácia kvantilov necentrálneho t-rozdelenia. In: Forum Statisticum Slovaca. - ISSN 1336-7420. - Vol. 3, No. 2 (2007), p. 54-59. (in Slovak)
- [7] JANIGA, I., GARAJ, I.: Štatistický tolerančný interval - nástroj riadenia kvality. In: Forum Statisticum Slovaca. - ISSN 1336-7420. - Vol. 3, No. 4 (2007), p. 46-57. (in Slovak)
- [8] JASEM, M.: Isometries and direct decompositions of pseudo MV-algebras. In: Mathematica Slovaca. - ISSN 0139-9918. - 57-1 (2007), p. 107-118. (in English)
- [9] JASEM, M.: On ideals of lattice ordered monoids. In: Mathematica bohemica. - ISSN 0862-7959. - 132-4 (2007), p. 369-387. (in English)
- [10] KLEMENT, E.P., KOLESÁROVÁ, A., MESIAR, R., SEMPI, C.: Copulas constructed from horizontal sections : Multivariate analysis. In: Communications in Statistics - Theory and Methods. - ISSN 0361-0926. - Vol. 36, No. 16 (2007), p. 2901-2911. (in English)
- [11] KLEMENT, E.P., KOLESÁROVÁ, A.: Intervals of 1-Lipschitz aggregation operators, quasi-copulas and copulas with given affine section. In: Monatshefte fur Mathematik. - ISSN 0026-9255. - Vol. 152, No. 2 (2007), p. 151-167. (in English)
- [12] KOLESÁROVÁ, A., MAYOR, G., MESIAR, R.: Weighted ordinal means. In: Information Sciences. - ISSN 0020-0255. - Vol. 177, Iss. 18 (2007), p. 3822-3830. (in English)
- [13] VARGA, Š., HORVÁTHOVÁ, I.: Fuzzy regression models with asymmetric fuzzy numbers. In: Forum Statisticum Slovaca. - ISSN 1336-7420. - Vol. 3, No. 2 (2007), p. 234-239. (in English)
- [14] VARGA, Š., HLADÍKOVÁ, M.: Neural networks versus nonparametric regression. In: Forum Statisticum Slovaca. - ISSN 1336-7420. - Vol. 3, No. 2 (2007), p. 229-233. (in English)
- [15] VARGA, Š.: Robus estimations in classical regression models versus robus estimations in fuzzy regression models. In: Kybernetika. - ISSN 0023-5954. - Vol. 43, No. 4 (2007), p. 503-508. (in English)

### Article in conference proceedings

- [1] BABINEC, Š.: Použitie autoregresívneho subprediktora v Echo State neurónových sieťach. In: Cognition and Artificial Life VII. - Opava:

Slezská univerzita. - ISBN 978-80-7248-412-6. - p. 29-36. (in Slovak)

- [2] JANIGA, I., GARAJ, I.: Application of statistical tolerance interval in quality control. In: REQUEST '06 : Sborník z konference. - Praha, 30.1. - 1.2. 2007. - Praha : Centrum pro jakost a spolehlivost výroby, ČVUT, 2007. - ISBN 978-80-01-03709-6. - p. 136-152. (in Slovak)
- [3] JANIGA, I., MOCÁK, J., GARAJ, I.: The link between the IUPAC detection limit and minimum detectable concentration. In: Measurement 2007 : Proceedings. 6th International Conference on Measurement. Smolenice, Slovak Republic, 20.-24.5.2007. - Bratislava : Institute of Measurement Science Slovak Academy of Sciences, 2007. - ISBN 978-80-969672-0-9. - p. 94-97. (in English)
- [4] KOLESÁROVÁ, A.: Best possible bounds for 1-Lipschitz aggregation functions determined from a partial information, and consequences for quasi-copulas and copulas. In: AGOP 2007 : Proceedings of the Fourth International Summer School on Aggregation Operators. - Ghent : Academia Press, 2007. - ISBN 978-90-382-1140-4. - p. 23-31. (in English)
- [5] KOLESÁROVÁ, A., MAYOR, G., MESIAR, R.: Ordinal means. In: New Dimensions in Fuzzy Logic and Related technologies. Volume I : Proceedings of the 5th EUSFLAT Conference. - Ostrava : Ostravská univerzita, 2007. - ISBN 978-80-7368-386-3. - p. 75-81. (in English)
- [6] MORDELOVÁ, J., KOLESÁROVÁ, A.: Some results on discrete copulas. In: AGOP 2007 : Proceedings of the Fourth International Summer School on Aggregation Operators. - Ghent : Academia Press, 2007. - ISBN 978-90-382-1140-4. - p. 145-150. (in English)
- [6] ŠABO, M.: Domination and Information Boundedness Principle for Aggregation. In: New Dimensions in Fuzzy Logic and Related technologies. Volume I : Proceedings of the 5th EUSFLAT Conference. - Ostrava : Ostravská univerzita, 2007. - ISBN 978-80-7368-386-3. - p. 41-45. (in English)
- [7] ŠABO, M.: Notes on Reverses of Binary Operations. In: Aplimat 2007. Book of abstracts : 6 th International conference. - Bratislava /Slovak Republik/, February 6-9, 2007. - ISBN 978-80-969562-9-6. - p. 433-439. (in English)

### Chapter or pages in book

- [1] BALÁŽ, V.: Remarks on uniform density u. In: Proceedings IAM 2007 workshop on informatics, automation and mathematics. - ISBN 978-80-227-2751-8. - p. 43-48. (in English)
- [2] GARAJ, I.: The approximation to a percentage point of the non-central t-distribution. In: Proceedings IAM 2007 workshop on informatics, automation and mathematics. - ISBN 978-80-227-2751-8. - p. 5-11. (in English)
- [3] HORANSKÁ, L.: Note on the generalized vector field problem. In: Proceedings IAM 2007 workshop on informatics, automation and mathematics. - ISBN 978-80-227-2751-8. - p. 49-52. (in English)
- [4] KOLESÁROVÁ, A.: Fuzzy utility functions. In: Proceedings IAM 2007 workshop on informatics, automation and mathematics. - ISBN 978-80-227-2751-8. - p. 21-27. (in English)
- [5] MESIAR, R., KOLESÁROVÁ, A., KOMORNÍKOVÁ, M., CALVO, T.: A review of aggregation functions. In: Fuzzy Sets and Their Extensions: Representation, Aggregation and Models. - p. 121-144. (in English)
- [6] ŠABO, M.: Information boundedness principles in fuzzy control processes. In: Proceedings IAM 2007 workshop on informatics, automation and mathematics. - ISBN 978-80-227-2751-8. - p. 16-20. (in English)
- [7] VARGA, Š.: Regression models - Estimations. In: Proceedings IAM 2007 workshop on informatics, automation and mathematics. - ISBN 978-80-227-2751-8. - p. 11-15. (in English)
- [8] ZELISKOVÁ, D., MATÚŠ, R.: The dependence structure of random variables modeled by copulas. In: Proceedings IAM 2007 workshop on informatics, automation and mathematics. - ISBN 978-80-227-2751-8. - p. 28-34. (in English)

# INSTITUTE OF ORGANIC CHEMISTRY, CATALYSIS AND PETROCHEMISTRY

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### Associate Professors:

Dušan Berkeš, PhD; Viktor Milata, PhD; František Považanec, PhD; Štefan Stankovský, PhD (until 30. 06. 2007); Ladislav Štibrányi, PhD;

### Assistant Professors :

Mária Bobošíková, PhD; Anna Koreňová, PhD; Angelika Lásiková PhD; Peter Szolcsányi PhD; Peter Šafář, PhD;

### Research Fellows:

Matej Babjak, PhD (until 30. 06. 2007); Branislav Dugovič, PhD; Andrej Kolarovič, PhD; Daniel Végh, PhD, DSc; Peter Zálupský, PhD; Jozefína Žúžiová, PhD;

### PhD Students:

Anita Andicsová; Barbora Baumlová (until 30. 09. 2007); Maroš Bella; Ivana Bradiaková (since 01. 10. 2007); Kristína Csátayová (01. 10. 2007); Jana Dohaňošová (since 01. 10. 2007); Eva Hýrošová (until 31. 03. 2007); Mária Gardiánová; Rasha Jame; Peter Kooš; Peter Kubizna; František Mathia (since 01. 10. 2007); Michal Medvecký (since 01. 10. 2007); Andrej Pažitný; Martin Petro (until 30. 09. 2007); Gabriel Podolan (since 01. 10. 2007); Zita Puterová (30. 09. 2007); Juraj Rehák; Tomáš Solčán; Tomáš Wiesenganger; Miroslava Žáková;

### Technical staff:

Eva Kaisová; Mária Krajčírová; Mária Nemcová; Anton Pavlíček; Jakub Rečičár; Iva Viskupičová;

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Basic Skills in Organic Chemistry Laboratory I, II.  
Organic Synthesis Laboratory

### B. Research laboratories:

Laboratory of Organic Synthesis  
Laboratory of Chiral Cycloaddition Reactions  
Laboratory of Heterocyclic Chemistry  
Laboratory of Stereoselective Synthesis  
Laboratory of Applied Organic Synthesis  
Laboratory of Natural Compounds  
Laboratory of Nuclear Magnetic Resonance Spectroscopy  
Laboratory of IR and UV Spectroscopy  
Laboratory of Gas Chromatography

## III. TEACHING

### A. Undergraduate Study:

2. semester (Bc)	Chemical Information	1/2/0	Zálupský, Berkeš
1. semester (Bc)	General and Organic Chemistry	3/1/0	Považanec, Valigura
3. semester (Bc)	Organic Chemistry	2/2/0	Gracza
3. semester (Bc)	Organic and Bioorganic Chemistry	2/1/0	Marchalín
	Organic Chemistry Laboratory	0/0/4	all teachers and research workers
4. semester (Bc)	Organic Chemistry	2/2/0	Fišera, Považanec
	Organic Chemistry Laboratory	0/0/4	all teachers and research workers
3. semester (Bc) (Pt)	Organic Chemistry	1/1/0	Milata, Považanec

	Organic Chemistry Laboratory	0/0/4	Lásiková, Wiesenganger, Šafař, Štibrányi
<b>4. semester (Bc) (Pt)</b>	Organic Chemistry	1/1/0	Gracza, Stankovský, Považanec
	Organic Chemistry Laboratory	0/0/4	Lásiková, Wiesenganger, Žáková, Petro
<b>5. semester (Bc)</b>	Chemical Information	1/1/0	Zálupský,
<b>6. semester (Bc)</b>	Chemical Specialities	2/2/0	Mravec, Štibrányi
	Semestral Project	0/0/4	Fišera, Šafař, Lásiková, Gracza, Szolcsányi, Milata, Végh
<b>1. semester (MSc)</b>	Organometallic Compounds	1/1/0	Gracza
	Mechanisms of Organic Reactions I	3/1/0	Fišera
	Bioorganic Chemistry	2/0/0	Berkeš
	Laboratory Project I	0/0/10	Milata, Szolcsányi, Gracza, Lásiková, Šafař
<b>1. semester (MSc)</b>	Organic Chemistry III	1/1/0	Považanec
<b>2. semester (MSc)</b>	Organic Synthesis	2/1/0	Marchalín
	Asymmetric Synthesis	2/1/0	Gracza
	Stereochemistry	0/2/0	Štibrányi
	Spectroscopic Methods in the Control of Technology	2/2/0	Milata, Segľa
<b>2. semester (MSc)</b>	Laboratory Project II	0/0/6	Berkeš, Koreňová
	Training at Industrial Production Floor	15 d	Berkeš, Koreňová
<b>3. semester (MSc)</b>	Mechanisms of Organic Reactions II	1/1/0	Marchalín
	Applied Organic Synthesis	1/1/0	Považanec
	Physical Organic Chemistry I	0/2/0	Milata
	Physical Organic Chemistry II	2/0/0	Kolarovič
	Chemistry of Natural Substances and Drugs	2/0/0	Berkeš
	Chemical Information Systems	2/0/0	Zálupský
<b>3. semester (MSc)</b>	Laboratory Project	0/0/10	Berkeš, Koreňová
<b>4. semester (MSc)</b>	Diploma Seminar		Považanec
	Diploma Thesis Project		Milata, Szolcsányi, Gracza, Lásiková, Považanec, Fišera, Marchalín

### C. Doctoral Study:

1. semester (PhD)	Advanced Organic Chemistry	2/0/0	Gracza
1. semester (PhD)	Advanced Stereochemistry	2/0/0	Fišera
2. semester (PhD)	Structure Reactivity Relationship	2/0/0	Marchalín
3. semester (PhD)	Advanced Organic Chemistry	2/0/0	Milata
3. semester (PhD)	Chemistry of Heterocyclic Compounds	2/0/0	Végh

## IV. CURRENT RESEARCH PROJECTS

### VEGA project No 1/3549/2006 Asymmetric and Stereoselective Reactions. Dipolar Cycloadditions, Sm(II)-Induced Additions, Cyclizations and Oxycarbonylations in the Total Syntheses of Natural Products and Its Analogues (Lubor Fišera)

The Sm(II) induced diastereoselective reductive coupling of sugar derived nitrones with ethyl acrylate will provide access to a variety of functionalized amino acids directly, or to amino acids as constituents of small peptides. The stereoselective synthesis of optically active polysubstituted pyrrolidin-2-ones and piperidine-2-ones from chiral amino acids which are promising precursors for the synthesis of several pyrrolizidine, pyrrolidine, indolizidine and piperidine alkaloids. The synthesis of non-proteinogenic amino acids derived nitrones, isoxazolidinyl nucleosides, spironucleosides and azanucleosides. The study of the effect of Lewis acids to influence diastereoselectivity of nitron cycloaddition reactions.

Asymmetric palladium(II)-catalyzed oxy-/aminocarbonylation and oxa-/aminobicyclization of unsaturated polyols and aminopolyols. Catalyst design using the calculation of the model for transition state. Correlation of enantioselectivity with calculated models of the transition states for prediction of the reaction stereoselectivity and stereochemistry of the products. The application of these reactions as the asymmetric key-steps in the total syntheses of natural compounds.

Project duration: from 01.01.2006 to 31.12.2008

**APVV project LPP-0238-06 Asymmetric synthesis based on a template for crystallization-induced asymmetric transformation (CIAT) (Lubor Fišera)**

Detailed information on application of acylacrylic subunit as a template for crystallization-induced asymmetric transformation (CIAT). Marking out the boundary for effective asymmetric synthesis by this method. Acquisition of information essential for next shift from acylacrylic template towards crystallization auxiliaries, making accessible future synthetic options. Simplification of existing synthetic procedures leading to chiral amino and hydroxyamino acids, respectively. 1,3-DCA of prepared alkenes with subsequent transformation to corresponding aminohydroxy acids and derivatives. Utilization of prepared chiral hydroxyamino acids in synthesis of selected target compounds containing piperidine or pyrrolidine skeleton.

Project duration: from 01.12.2006 to 30.11.2009

**APVV project No 20-000305 New strategies for stereoselective and asymmetric syntheses of biologically active natural compounds (Tibor Gracza)**

Development of the new stereoselective and asymmetric strategies for functionalization of C=C double bond of alkenes with introduction of O- and/or N-functions. Asymmetric Pd(II)-catalyzed oxy-/aminocarbonylations of unsaturated polyols and amino polyols. Catalyst design using X-ray and electron density analysis and QM method. Theoretical calculations of TS-models for prediction of stereochemical outcome (ee%) of the reactions. Their application in the syntheses of natural compounds and biologically interesting compounds. Stereoselective synthesis of optically active polysubstituted pyrrolidin-2-ones and piperidin-2-ones from chiral  $\alpha$ -amino acids - precursors for preparation of polyhydroxylated pyrrolidines, piperidines, pyrrolizidines and indolizines. The synthesis of non-proteinogenic amino acids derived nitrones, isoxazolidinyl nucleosides, spironucleosides and azanucleosides. The study of the effect of Lewis acids to influence diastereoselectivity of nitrone cycloaddition reactions.

Project duration: from 01.03.2006 to 28.02.2009

**VEGA project No 1/2456/05 Stereoselective Syntheses of Chiral 1,4-Dihydropyridines and Analogs of Indolizine type Alkaloids (Stefan Marchalín)**

The principal goal of the project is to investigate possible utilization of 2-formyl- dihydropyridines in the synthesis of novel chiral nonracemic 2-substituted dihydropyridines, bi- and tricyclic heterocycles respectively, containing a 1,4-dihydropyridine ring. Preparation and characterization of coordination compounds of both transition and non transition metals carrying 1,4-dihydropyridine based ligands, examination of their composition, structure, and investigation of their catalytic activity. The project aims at preparation of carefully designed substituted indolizines and indolizidines - compounds with possible bioactivity. Practical application of regio-, chemo- and stereoselective reactions making use of novel features of organic synthesis. Elaboration of novel, simple, and generally applicable stereocontrolled syntheses of pure analogs of indolizine type alkaloids, utilizing chiral synthons based on hetero[ $\pi$ ]indolizidinediones.

Project duration: from 01. 01. 2005 to 31.12.2007

**VEGA 1/4453/07 Syntheses directed towards novel  $\pi$ -conjugated heterocyclic compounds such that show opto-electronic properties, specific bioactivity, and apoptosis (Daniel Végh).**

Design of syntheses, supported by theoretical studies, of novel heterocyclic compounds. Research into novel synthetic procedures, reactions and catalysts, structure elucidation of prepared target compounds and reaction mechanisms involved. Synthesis of derivatives of novel  $\pi$ -conjugated heterocycles of the thiophene, pyrrole, furan, imidazole, pyrazine, fluorene and anthrone derivatives series as well as of their bioactivity. Study of controlled dimerization and trimerization of the synthesized  $\pi$ -conjugated heterocyclic compounds for preparation of molecular and supramolecular functional units and nanostructures. Synthesis of thiophene oligomers in the channels of synthetic zeolite and at the surface of inorganic conductor TiO<sub>2</sub> aiming at preparation of anisotropic photoactive system organic compounds-inorganic substrate. Characterization of the prepared heterogeneous composite as to its structure, spectral and magnetic properties. Modeling of novel supramolecular units and potential  $\pi$ -conjugated antenna systems for molecular recognition and self-assembly by utilizing theoretical calculations and combination of various building blocks. Synthesis and utilization of perfluoroaromatics for molecular recognition. Synthesis and modelling of structure of compounds active against cancer and launching apoptosis.

Project duration: from 01. 01. 2007 to 31. 12. 2009

**VEGA project No 1/2469/05 Study of stereoselective transformations of non proteinogenic oxoaminocarboxylic acids (Dušan Berkeš)**

Synthesis of enantiomerically pure, conformationally restricted derivatives of homophenylalanine and of its heteroanalogues by crystallization induced asymmetric transformation (CIAT) coupled with the aza-Michael addition and electrophilic lactonization. Study of simultaneous CIAT taking place at two stereogenic centers. Synthesis and stereoselective transformations of bicyclic tetramic acid derivatives. Utilization of such asymmetric transformation in the synthesis of natural polysubstituted amino acids and their derivatives. Preparation of 5 aryl-substituted 3-amino-2-hydroxytetrahydrofurans and study of their conversion to optically pure substituted C-aryl amino-furanosides.

Project duration: from 01.01.2005 to 31.12.2007

**VEGA project No 1/248/05 Polyazaheterocycles and their oxygen analogues. Ecologically more suitable syntheses, supramolecular structure, biological – physical properties (Viktor Milata)**

The project aims at preparation of novel aromatic polyazaheterocycles on the bases of triazines, dihydropyridines, pyrimidines, quinolines and quinazolines, having additional fused aromatic or saturated ring. In the early stages of the project we shall concentrate on preparation of precursors to the above heterocycles by modern, more ecological methods. Next the precursors will be used in cyclization and cyclocondensation reaction leading to target compounds. Prepared heterocycles will be modified to enhance their hydrophilicity and hence bioactivity by attaching a sugar or other hydrophilic moiety. Our attention will concentrate on physicochemical and spectral characteristics, combined with x-ray analysis, supramolecular chemistry and quantum chemical calculations.

Project duration: from 01.01.2005 to 31.12.2007

**APVV Project No. 20-007304 Synthesis and properties of the pharmacologically potentially active nitrogen heterocycles (Viktor Milata)**

Study and optimisation of the new synthetic methods for preparation of analogues of natural condensed aromatic polyazaheterocyclic compounds with fused aromatic or saturated ring containing O, S, Se or N atoms. Preparation of precursors of cited heterocycles and their nitro- and aminoderivatives, imidoylchlorides, imidoyl and amidinoylisothiocyanates. Exploitation of new precursors in cyclisation and cyclocondensation reactions for preparation of target compounds. Derivatization of newly prepared heterocyclic compounds by introduction of carbohydrate or other hydrophilic part aiming to higher solubility of prepared compounds allowing their more effective biological application. Study of physico-chemical properties and spectral characteristics of final derivatives in relation to their X-ray structural analysis, supramolecular chemistry using quantum-chemical calculations.

Project duration: from 01.01.2005 to 31.12.2007

**APVT Project No. 20-000904 Asymmetric Pd(II)-catalysed reactions as a methodology for the preparation of chiral building blocks for the synthesis of biologically active natural compounds (Peter Szolcsányi)**

The main aim of the project is to develop a new and efficient methodology of asymmetric palladium-catalysed intramolecular and intermolecular aminocarbonylations and halocyclisations for the enantioselective preparation of optically pure building blocks. These valuable intermediates will serve as suitable chiral precursors for targeted total syntheses of biologically active natural compounds and/or their analogues with their potential use in human medicine. The sub-objectives of the project involve the development of a simple and rapid preparation of necessary aminoalkenitols as starting substrates in multi-gram quantities and required purity, as well as an effective synthesis of enantiomerically pure chiral Pd-catalysts essential for key asymmetric transformations.

Project duration: from 01.01.2005 to 31.12.2007

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
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Synkola, Bratislava	Seminars and conferences	Karvaš Milan, director, Mlynská dolina, 842 15 Bratislava 4	01.01.1992-
Duslo, Šaľa	The synthesis of heterocyclic compounds.	Lehocký Peter, director, Duslo, a. s. 927 03 Šaľa	01.01.1990-
Slovak Academy of Sciences, Bratislava	The synthesis of heterocyclic compounds.	Tvaroška Igor, director, Dubravská cesta 9, 841 04 Bratislava 4	01.01.1970
Slovak Academy of Sciences, Bratislava	The synthesis of heterocyclic compounds.	Šoltés Ladislav, UEF, Dubravská cesta 9, 841 04 Bratislava 4	01. 01.1997-
Tau-Chem, Bratislava	The synthesis of heterocyclic compounds.	Žvak Vladimír, director, Nobelova 34, 836 05 Bratislava 3	01.01.1996
Institute of Drugs Research, Modra	The synthesis of heterocyclic compounds.	Šmahovský Vendelín, director, Horná 36, 900 01 Modra	01.01.1980-
Tatra Trade, Prievidza	The synthesis of heterocyclic compounds.	Klínovský Ján, director, Matice slovenskej 10, 971 01 Prievidza	01.01.2000-
Georganics, Bratislava	The synthesis of heterocyclic compounds.	Ďuriš Juraj, director, Koreničova 1, 811 03 Bratislava 1	01.01.2000-
CMS, Bratislava	The synthesis of heterocyclic compounds.	Toman Jaromír, director, Nobelova 34, 836 03 Bratislava 3	01.01.2000-
Zentiva a.s., Hlohovec	Research and teaching	Chylik Jaroslav Dr., API prod. manager, Nitrianska cesta 100, 920 27 Hlohovec	01.07.2003-

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Inst. für Angewandte Synthese Chemie TU Vienna, Austria	The synthesis of heterocyclic compounds	Fröhlich Hannes, dean, professor, Getreide Markt 9, A-1060 Vienna, Austria	01. 01. 1991-
Inst. für Organische Chemie Univ. Stuttgart, Germany	Stereoselective dipolar cycloaddition and oxycarbonylation reactions	Jäger Volker, professor, Pfaffenwaldring 55, D-70569 Stuttgart, Germany	01. 01. 1989-
Max Plank Institute, Stuttgart, Germany	The synthesis of heterocyclic compounds for nanotubes	Roth Siegmard, Dr., Helsenbergerstr. 1, D-70569 Stuttgart, Germany	01.01.2002-
Inst. für Organische Chemie Univ. Berlin, Germany	Stereoselective reactions of chiral nitrones	Reissig Hans-Ulrich, professor, Takustr. 3, D-14195 Berlin, Germany	01. 01. 2002-
Inst. de Chimie Moleculaire d'Orsay, France	Resau formation recherche	Basch E. H., professor, IUT d'Orsay Université de Paris-Sud (XI) Département Chimie Plateau du Moulon 91400 ORSAY, France	01.01.1976-
Inst. de Chimie Moleculaire d'Orsay, France	Resau formation recherche	Fiaud, J. C., professor, IUT d'Orsay Université de Paris-Sud (XI) Département Chimie Plateau du Moulon 91400 ORSAY, France	01.05. 2007-
Institute de Chimie Moleculaire, Orsay, Univ. Paris-Sud, France	NMR study of chiral compounds and cooperation in exchange of students	Loupy, A. , professor, Institut of Molecular Chemistry, ICMO, University Paris – South, Orsay, France	01.01.2000-
URCOM, Univ. Le Havre, France	The synthesis of condensed heterocyclic compounds	DECROIX B., DAICH A., professors Laboratoire de Chimie URCOM, EA 3221 Faculté des Sciences et Techniques Université du Havre 25, r	01.01.1990
Inst. für Festkörperphysik der Univ. Vienna, Austria	New materials for microelectronics	Kauffmann H. F. professor, University of Vienna, Institut für Physikalische Chemie, Währingerstrasse 42, Wien, Austria.	01.010.2001-

Laboratorium für Org. Chem, ETH, Zürich, Switzerland	The total synthesis of natural products	Vasella Andrea, professor ETH Hönggerberg, HCI H315 CH-8093, Zürich, Switzerland	01.01.1990-
Institute of Organic Chemistry, U Warsaw, Poland	The synthesis of heterocyclic compounds	Cyranski, M. K., professor, 02 093 Warsaw, Poland	01.01.1996-
Department of Organic Chem. and Biology UNED, Madrid, Spain	The synthesis of heterocyclic compounds, NMR spectroscopy	Claramunt, R. M., Cabildo, P., Lopéz G., professors, UNED, Madrid, Spain	01.01.1998-
Instituto de Quimica Medica (CSIC), Madrid, Spain	Physical organic chemistry	Elguerro, J. B., professor, Madrid, Spain	01.01.1998-
Institute of Organic Chemistry, Panon Univ. Mosonmagyaróvár, Hungary	The synthesis of heterocyclic compounds. Utilization in Agriculture	Schmiedt Rudolf, professor, Mosonmagyaróvár, Hungary	01.01.1997-
Institute of Organic Chemistry, Technical Univ. Budapest, Hungary	NMR Spectroscopy of fluoroinated heterocycles	Szöllösy Aron, professor, Budapest, Hungary	01.01.2004-
Department of Chemistry, Univ. Puerto Rico, USA	Structure determination of amino acids and peptides	Baran Peter, Dr, Department of Chemistry, Univ. of Puerto Rico, Rio Pedras, PO Box 23346, San Juan 00931-3346, Puerto Rico, USA	2002
Department of Chemistry, Keele University, United Kingdom	The synthesis of heterocyclic compounds	Ramsden Christopher, professor, Keele, Staffordshire ST55BG, United Kingdom	1980
Department of Chemistry, Cambridge University, United Kingdom	The total synthesis of natural products	Ley Steven V., professor, Cambridge University, United Kingdom	1998
School of Chemistry, Manchester University, United Kingdom	The total synthesis of natural products	Dixon Darren J., professor, Manchester University, United Kingdom	2005

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Fišera Ľubor	Academic board of STU	member	2003
Fišera Ľubor	Academic board of FCHPT	member	1997
Fišera Ľubor	APVV Grant Agency	member	2006
Gracza, Tibor	Scientific Grant Agency	member	2005
Fišera Ľubor	Chemical Papers	member	1994
Berkeš Dušan	Slovak Chemical Society	member	1984
Bobošíková Mária	Slovak Chemical Society	member	1993
Fišera Ľubor	Slovak Chemical Society	chairmann	1971
Gracza Tibor	Slovak Chemical Society	member	1984
Koreňová Anna	Slovak Chemical Society	member	1983
Milata Viktor	Slovak Chemical Society	vice-president	1977
Považanec František	Slovak Chemical Society	member	1983
Stankovský Štefan	Slovak Chemical Society	member	1971
Szolcsányi, P.	Slovak Chemical Society	member	2006
Šafař Peter	Slovak Chemical Society	member	2000
Végh Daniel	Slovak Chemical Society	member	1972
Žúžiová Jozefína	Slovak Chemical Society	member	1989
Gardianová Mária	Slovak Chemical Society	member	2002
Lásiková Angelika	Slovak Chemical Society	member	1996
Marchalín Štefan	Slovak Chemical Society	member	2005
Berkeš Dušan	Slovak Society of Industrial Chemistry	member	1995
Bobošíková Mária	Slovak Society of Industrial Chemistry	member	1995
Fišera Ľubor	Slovak Society of Industrial Chemistry	member	1993
Gracza Tibor	Slovak Society of Industrial Chemistry	member	1996
Koreňová Anna	Slovak Society of Industrial Chemistry	member	1995
Milata Viktor	Slovak Society of Industrial Chemistry	member	1993
Marchalín Štefan	Slovak Society of Industrial Chemistry	member	1996

Považanec František	Slovak Society of Industrial Chemistry	member	1995
Stankovský Štefan	Slovak Society of Industrial Chemistry	member	1995
Šafař Peter	Slovak Society of Industrial Chemistry	member	1998
Végh Daniel	Slovak Society of Industrial Chemistry	member	1993
Žúžiová Jozefína	Slovak Society of Industrial Chemistry	member	1995
Gardianová Mária	Slovak Society of Industrial Chemistry	member	2003
Lásiková Angelika	Slovak Society of Industrial Chemistry	member	1996
Zálupský Peter	Slovak Society of Industrial Chemistry	member	1996
Štibrányi Ladislav	Slovak Society of Industrial Chemistry	member	1995
Dugovič Branislav	Slovak Society of Industrial Chemistry	member	2003
Babjak Matej	Slovak Society of Industrial Chemistry	member	2000

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Fišera Ľubor	ARKIVOC	member	2000
Fišera Ľubor	American Chemical Society	member	1994
Fišera Ľubor	German Chemical Society	member	1994
Fišera Ľubor	Czech Chemical Society	member	1994
Fišera Ľubor	Jordan Journal of Chemistry	member	2006
Gracza Tibor	American Chemical Society	member	2006
Gracza Tibor	German Chemical Society	member	1994
Gracza Tibor	Czech Chemical Society	member	1997
Marchalín Štefan	Czech Chemical Society	member	1980
Milata Viktor	Czech Chemical Society	member	2002
Milata Viktor	ARKIVOC	member	2000
Végh Daniel	Magyar Tudomanos Akademia	member	2001
Gracza Tibor	Advisory Board of EUROCAT	member	2002
Milata Viktor	Molecules	member	2000
Milata Viktor	Eur. J. Org. Chem.	member	2002

#### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Samantha, L. Y.	IUT Orsay, Univ. Paris-Sud	France	May-June 2007 (60 days)
Freydier, M.	IUT Orsay, Univ. Paris-Sud	France	May-June 2007 (60 days)
Porte, S.	IUT Orsay, Univ. Paris-Sud	France	May-June 2007 (60 days)
Bellus, D.	Basel	Switzerland	2007 (2 days)
Jacobsen, E. N.	Harward University	USA	April 2007 (1 day)
Gärtner, P.	TU Vienna	Austria	April 2007 (1 day)
Fröhlich, H.	TU Vienna	Austria	October 2007 (1 day)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Andicsová, A.	Univ. Clermont-Ferrand	France	2007 (180 days)
Babjak, M.	Boehringer	Germany	2007 (180 days)
Baumlová, B.	Univ. Grenoble	France	2007 (30 days)
Baumlová, B.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Berkeš, D.	Univ. Le Havre	France	June 2007 (30 days)
Dohaňošová, J.	Univ. Stuttgart	Germany	April 2007 (3 days)
Dugovič, B.	FU Berlin	Germany	2007 (365 days)
Fišera, Ľ.	Univ. Stuttgart	Germany	April 2007 (3 days)
Fišera, Ľ.	FU Berlin	Germany	2007 (30 days)
Fišera, Ľ.	Conference, Petra	Jordan	July 2007 (8 days)
Fišera, Ľ.	BDSHC, Tihany	Hungary	June 2007 (3 days)

Fišera, L.	Conference, Luxor	Egypt	February 2007 (8 days)
Fišera, L.	Coimbra	Portugal	May 2007 (7 days)
Gracza, T.	FU Berlin	Germany	May 2007 (5 days)
Gracza, T.	HWI-Karlsruhe	Germany	May 2007 (3 days)
Gracza, T.	Univ Stuttgart	Germany	2007 (60 days)
Gracza, T.	Univ. Stuttgart	Germany	April 2007 (3 days)
Gracza, T.	Univ. Paris-Sued	France	June, 2007 (2 days)
Hýrošová, E.	Univ. Stuttgart	Germany	April 2007 (3 days)
Hýrošová, E.	FU Berlin	Germany	June, 2007 (30 days)
Karlubíková, O.	Univ. Stuttgart	Germany	April 2007 (3 days)
Kolarovič, A.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Kolarovič, A.	Univ. Stuttgart	Germany	April 2007 (3 days)
Koóš, P.	Univ. Grenoble	France	2007 (120 days)
Koóš, P.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Kubizna, P.	ETH Zürich	Switzerland	2007 (330 days)
Lásiková, A.	Univ. Clermont-Ferrand	France	June 2007 (5 days)
Marchalín, Š.	Univ. Le Havre	France	June 2007 (30 days)
Medvecký, M.	Univ. Stuttgart	Germany	April 2007 (3 days)
Milata, V.	T. Univ. Vienna	Austria	2007 (10 days)
Milata, V.	Univ. Paris-Sued	France	July, 2007 (31 days)
Milata, V.	Conference, Toruń	Poland	September 2007 (5 days)
Milata, V.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Palík, M.	Univ. Stuttgart	Germany	April 2007 (3 days)
Podolan, G.	Univ. Stuttgart	Germany	April 2007 (3 days)
Puterová, Z.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Puterová, Z.	TU Vienna	Austria	July, 2007 (31 days)
Rehák, J.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Szolcsányi, P.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Szolcsányi, P.	Bürgenstock, conference	Switzerland	April 2007 (4 days)
Solčan, T.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Végh, D.	Univ. Mosonmagyaróvár, Univ. Budapest	Hungary	2007 ((2 days)
Végh, D.	TU Vienna	Austria	2007 (5 days)
Wiesenganger, T.	BDSHC, Tihany	Hungary	June 2007 (3 days)
Wiesenganger, T.	Univ. Stuttgart	Germany	April 2007 (3 days)
Žáková, M.	BDSHC, Tihany	Hungary	June 2007 (3 days)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Fáberová, Z.	Bicyclopropylidene as a dipolarophile in the 1,3-cycloaddition reactions of carbohydrate-based nitrones.	Kolarovič, A.
Geško, J.	Stereocontrol of 1,3-cycloadditions targeted to the synthesis of isoxazolidine nucleosides.	Fišera, L.
Nebus, B.	Synthesis of the vasocinones – the intermediates of the chinazoline-based glycosides synthesis.	Stankovský, Š.
Trnovcová, J.	Methods of preparation and the applications of the 1-nitropropan-2-one.	Milata, V.
Tóthová, E.	Stereoselective syntheses of furoindolizidines.	Šafař, P.
Záborský, O.	Methods of nucleoside synthesis.	Fišera, L.
Palík, M.	The total synthesis of (+)-Varitriole.	Gracza, T.
Kavala, M.	The synthesis of <i>epi</i> -dihydropinidine.	Szolcsányi, P.
Kameschová, E.	Benzylidene acetals – the regioselective ring opening.	Lásiková, A.

## B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Csatayová, K.	Total synthesis of (+)-epipinidinone.	Szolcsányi, P.
Doháňošová, J.	Domino reactions: Wacker type reaction-cross coupling.	Lásiková, A.
Karlubíková, O.	Pd(II)-catalyzed bicyclizations in the natural product synthesis. Total synthesis of varitriol.	Gracza, T.
Kertész, M.	Stereoselective synthesis of 4(9)-hydroxythieno[f]indolizidines from glutamic acid.	Marchalín, Š.
Mathia, F.	Synthesis of Epidihdropinidine	Szolcsányi, P.
Medvecký, M.	Preparation of Modified Isoxazolidinyl Nucleosides	Fišera, L.
Petráš, P.	Three-Component Mannich Reaction in Tandem with Crystallization Induced Asymmetric Transformation. Straightforward Access to the Optically Pure $\gamma$ -oxo- $\alpha$ -Aminoacid Derivatives	Považanec, F.
Podolan, G.	Preparation and 1,3-Dipolar Cycloadditions of Chiral Nitrones	Fišera, L.
Škodová, M.	Preparation and Properties of Fluorinated Quinolones and Their Precursors	Milata, V.
Svítková, Z.	Preparation and Properties of Pyridocondensed Benzimidazole Derivatives	Milata, V.

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### Article in journal

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## DEPARTMENT OF ORGANIC TECHNOLOGY

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### Technical staff:

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## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Technological laboratory 1, 2, 3, 4

### B. Research laboratories:

Laboratory of catalytic processes

Laboratory of reactor technique

Laboratory of separation (chromatographic) methods

Laboratory of spectroscopic methods

## III. TEACHING

### A. Undergraduate Study:

<b>3. semester (Bc)</b>	Organic Technology and Petrochemistry- SP- Chemical Technology	(2-3 h)	Hronec, Kaszonyi, Gašparovičová
	Organic Technology and Petrochemistry- SP- Polymer Materials and Technology	(2-1 h)	Hronec, Gašparovičová
	Organic Technology and Petrochemistry- SP- Chemical Engineering	(2-0 h)	Hronec,
<b>4. semester (Bc)</b>	Organic Technology and Petrochemistry	(3-1 h)	Hronec, Kaszonyi, Gašparovičová
<b>5. semester (Bc)</b>	Data processing on PC	2-2	Kaszonyi
<b>6. semester (Bc)</b>	Fine Chemicals	(2-2 h)	Mravec
	Semestral project	(0-4 h)	Cvengrošová, Hronec, Kaszonyi, Mravec, Štolcová, Gašparovičová
<b>1. semester (MSc)</b>	Chemical-Engineering Thermodynamics	(0-2 h)	Gašparovičová
	Catalysis	(2-0 h)	Hronec
	Engineering Calculations on a Computer	(1-2 h)	Kaszonyi

	Processes of Organic Technology	(2-1 h)	Králík
<b>1. semester (MSc)</b>	Laboratory Practise I	(0-8 h)	Cvengrošová, Gašparovičová, Hronec, Horváth, Kaszonyi, Mravec, Štolcová
<b>2. semester (MSc)</b>	Kinetics and Reactors	(0-2 h)	Kaszonyi
	Process Design	(2-1 h)	Hronec, Králík
	Technology of Monomers and Polymers	(2-0 h)	Štolcová
	Special Organic Products	(2-0 h)	Mravec
<b>2. semester (MSc)</b>	Analysis of Complex Organic Systems	(0-2 h)	Štolcová, Cvengrošová
	Laboratory Practise II	(0-7 h)	Cvengrošová, Horváth, Hronec, Kaszonyi, Gašparovičová, Mravec, Štolcová
<b>3. semester (MSc)</b>	Coating Materials	(2-0 h)	Kramár
	Manufacturing of Pharmaceuticals	(2-1 h)	Mravec
	Laboratory Practise III	(0-14 h)	Cvengrošová, Horváth, Hronec, Kaszonyi, Gašparovičová, Mravec, Štolcová
	Environmental Technologies	(2-0 h)	Mravec
<b>4. semester (MSc)</b>	Seminar to Masters Theses	(0-3 h)	Cvengrošová, Hronec, Kaszonyi, Štolcová
<b>1. -2. semester (PhD)</b>	Sophisticated Materials	(2 h)	Hronec
	Kinetics and Modeling	(2 h)	Kaszonyi

#### IV. CURRENT RESEARCH PROJECTS

##### **VEGA project No.1/2459/05 Catalysts for speciality chemicals (M. Hronec)**

The scientific objective of the project is to use a series of well characterized catalysts in the synthesis of nitrogen and oxygen containing compounds in order to establish quantitative relationships between the catalytic properties (activity, selectivity, deactivation) and chemical properties of the catalysts. Catalytic reactions are focused on the preparation of industrially very important nitrogen and oxygen containing compounds or their precursors using oxidation, hydrogenation, and condensation processes. Gas-phase hydroxylation and oxidative amination of benzene, liquid phase hydrogenation of aromatic nitro compounds, partial oxidation of methane to formaldehyde, selective oxidation of cyclohexylamine to cyclohexanone oxime, oxidation of propylene to propylene oxide and head-tail oxidative condensation of aniline are the main reactions. The benefits expected are mainly clean processes for the synthesis of these chemicals or new catalysts.

Project duration: from January 2006 to December 2007

##### **VEGA project No. 1/3587/061 ntermediates for fine chemicals (D. Mravec)**

The main objective of the project is utilisation of enviro-catalysts (ion-exchange resins and zeolites) for development of important organic chemicals: Glycerol ethers as perspective oxygenate additives to fuels (utilisation of bioglycerol from FAME production), shape-selective alkylation of toluene with isobutylene over zeolite catalysts with the aim of 4-tert-butyl toluene (intermediate) preparation. Shape selective alkylation of aromatic amines over zeolite catalysts. The benefits are enviromentally-friendly ways for preparation of organic intermediates and products.

##### **APVV project No. 20-036805 Chemical and biochemical transformations of glycerol from renewable sources to fine chemicals and fuel components without sulfur (A. Kaszonyi)**

Research and development of new catalytic and biochemical methods of production of chemical specialties and fuel components without sulfur, which enhance the appreciation of glycerol from renewable bio-sustainable sources. Mainly catalytic and biochemical transformation of glycerol to commercially prospective products and development of refining technology of raw glycerol. The goal of project in the field of catalytic process is to specify the catalyst (from the group of rare metals) and reaction conditions (temperature, pressure, reactor) for selective transformation of glycerol to desired

products. To substantial products of glycerol transformation belong glycerol carbonate, propandiol, and the products of condensation, etherification, oxidation and oligomerisation.

Project duration: from May 2006 to February 2009

**APVV project No. 99-P00405 Research of chemical specialties production based on home-made raw materials APVVL. (Komora VUP, A. Kaszonyi FCHFT)**

Development of design fundamentals for technology of 4-oxo-2,2,6,6-tetramethylpiperidin-N-oxyl and 4-hydroxy-2,2,6,6-tetramethylpiperidin-N-oxyl from domestic raw materials.

Project duration: from September 2005 to August 2007

**APVV project No. 99-003105 Highly-effective catalysts for polyurethanes (M. Matisová VUP, A. Kaszonyi FCHFT)**

Development of design fundamentals for technology of highly-effective catalysts for polyurethanes based on diaminoethers from domestic raw materials. The new catalyst, which after action is chemically bounded to polyurethanes, eliminate the shortage of old one, which are volatile and causes smell of products.

Project duration: from May 2006 to August 2008

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
DETOX, a. s. Banská Bystrica		Kaszonyi	from 1996
DUSLO, a. s., Šafa		Hronec	from 1996
FERMAS, s. r. o., Slovenská Ľupča		Kaszonyi	from 2003
NCHZ, a. s., Nováky		Kaszonyi	from 1995
PlasticOmnium, s. r. o., Lozorno		Kaszonyi	from 2002
SLOVNAFT VURUP, a. s., Bratislava	APVV project	Kaszonyi, Hronec	from 1990
VUCHT, Bratislava		Hronec	from 1990
Tento, Žilina		Kaszonyi	from 2005
CarCode, Bratislava		Kaszonyi	from 2001
Mostex		Mravec	from 2005
Faculty of Natural Sciences, CU, Bratislava	APVV project	Kaszonyi	from 2006
VUP a.s., Prievidza	APVV projects	Kaszonyi	from 2005
SLOVAKOFARMA, a.s., Hlohovec		Mravec	from 1995

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
ENSCM, Montpellier, France	- zeolite catalysts, - physico-chemical characterisation of solid catalysts	Mravec, Hronec	from 1992
Universita di Padova, Italy	ad hoc projects on polymer supported catalysts, characterisation	Králik, Hronec	from 1991
Italian National Centre of research, Padova - Legnaro, Italy	ad hoc project on preparation of organic supports for catalysts	Králik, Hronec	from 1993
Bangkok University Thailand	Catalysts for oxidation processes	Hronec	from 2004
Research Support. Dep. Korea	Oxidation of alkylaromatics	Hronec	from 2005
M&G Fin. Industr., Italy	Oxidation processes	Hronec	from 2003
Gifu University, Japan	Alkylation of aromatics, zeolites characterization	Mravec	from 2003
CNRS, Lyon, France	Oxidation of organic materials	Hronec, Horváth	from 2002

Institut für Anorganische Chemie, Rheinische Friedrich-Wilhelms-Universität, Bonn, Germany	Catalysts for oxidation of methane	Štolcova, Hronec	from 2005
Institut für Materialchemie, Universität Wien, Austria	Catalytic reduction of nitrates	Hronec, Králik, Gašparovičová	from 2002

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Hronec M.	SAIV (Slovak Academy of Engineering Sciences)	chairmann	from 2001
Hronec M.	SSPCH (Slovak Society for Industrial Chemistry)	chairmann	from 1990
Hronec M., Kaszonyi A., Mravec D., Cvengrošová Z., Štolcová M.	SSPCH (Slovak Society for Industrial Chemistry)	member	from 1990
Hronec M., Kaszonyi A., Mravec D., Horváth B.	SCHS (Slovak Chemical Society)	member	from 1990
Hronec M.	Editorial Board of Journal: Petroleum and Coal	member	from 1992

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Hronec M.	National representative of the European Federation of catalysis Societies (EFCATS)	member	from 1992
Hronec M.	Member of the European Academy of Sciences and Arts	member	from 1995

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Zeman Svatopluk	VŠCHT Pardubice	CR	5. – 7. 6. 2007
Pancharoen Ura	University Bangkok	Thailand	24. – 28. 9. 2007
Praserthdam Vichitra	University Bangkok	Thailand	18. – 21. 10. 2007
Praserthdam Piyasan	University Bangkok	Thailand	18. – 21. 7. 2007

### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Hronec M.	University Bangkok	Thailand	4. – 15.1. 2007
Slobodník M.	University Bangkok	Thailand	20. 2. – 25. 8. 2007
Hronec M.	ICT Prague	CR	29. 1. 2007
Kaszonyi A., Mravec D.	Oleochemicals under Cahnging Global Conditions, Hamburg	Deutschland	25. – 27. 2. 2007
Mravec D.	Enschede	Netherland	6. – 8. 3. 2007
Kaszonyi A., Mravec D., Štolcová M.	Veszprém	Hungary	30. 3. 2007
Hronec M.	State exams PhD, ICT Prague	ČR	12. 4. 2007
Hronec M.	VŠCHT Praha	CR	24. – 25. 4. 2007
Hronec M.	8 <sup>th</sup> Natural Gas Conversion Symposium, Natal	Brasil	25. 5. – 2. 6. 2007
Hronec M.	State exams ICT Praha	CR	4. – 6. 6. 2007
Hronec M., Horváth B., Štolcová M.	Europacat VIII, Turku	Finland	25. 8. – 1. 9. 2007
Hronec M.	CAFC-8, Verbania	Italy	16. – 21. 9. 2007
Hronec M.	SC ICT, Praha	CR	18. – 19. 10. 2007

Hronec M., Horváth B., Krejčová B., Rakottay K., Slobodník M.	XXXIX. Symposium on Catalysis, Prague	CR	4. – 6;. 11. 2007
Hronec M.	Wien	Austria	7. 12. 2007

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Gramann Richard	Výroba a použitie antioxidantov Manufacture and uses of antioxidants	Kaszonyi Alexander
Mráz Ján	Výroba etanolu a smery jeho využitia Manufacture and uses of ethanol	Mravec Dušan
Polnišer Róbert	Výroba a využitie metanolu Manufacture and uses of methanole	Štolcová Magdaléna
Soták Tomáš	Nanomateriál v oxidačných procesoch Nanomaterials in oxidations	Hronec Milan
Šefčík Andrej	Výroba a využitie propylénoxidu Manufacture and uses of propyleoxides	Štolcová Magdaléna
Zelovič Marek	Výroba a využitie ftalanhydridu Manufacture and uses of phtalanhydrides	Štolcová Magdaléna
Augustínová Martina	Výroba a použitie difenylamínu Manufacture and uses of diphenylamine	Kaszonyi Alexander
Špačeková Olga	Výroba a použitie antioxidantov na báze p-difenylamínu Manufacture and uses of antioxidants of zhe p-phenylediamine type	Gašparovičová Dana
Vencelová Petronela	Výroba a využitie karboxylových kyselín Manufacture and uses of carboxylic acids	Štolcová Magdaléna

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Boroš Tomáš	Katalytická oxidácia bioglycerolu Catalytic oxidation of bioglycerole	Štolcová Magdaléna
Florovič Stanislav	Syntéza kyseliny nikotínovej selektívnou oxidáciou 3- pikolínu Synthesis of nicotinic acid by selective oxidation of 3- picoline	Hronec Milan
Hollý Michal	Priama premena metánu na formaldehyd Direct transformation of methane to formaldehyde	Štolcová Magdaléna
Kocman Richard	Katalytická oxidácia cyklohexánu Catalytic oxidation of cyclohexane	Gašparovičová Dana
Kutašová Viktória	Syntéza pyridínových báz z etanolu, formaldehydu a amoniaku Synthesis of pyridine bases from ethanol, formaldehyde and ammonia	Cvengrošová Zuzana
Lelovský Marek	Štúdium kondenzačných reakcií glycerolu a močoviny Study of condensation reactions of glycerol and urea	Kaszonyi Alexander
Lovič Martin	Alkylácia difenylamínu na zeolitových katalyzátoroch Alkylation of diphenylamine over zeolite catalysts	Mravec Dušan
Madáč Peter	Aminácia fenolu v kvapalnej fáze Amination of phenol in liquid phase	Hronec Milan
Šulc Marek	Oxidácia cyklohexylamínu na heterogénnych katalyzátoroch Oxidation of cyclohexylamine over heterogeneous catalysts	Kaszonyi Alexander
Tobiáš Tomáš	Selektívna oxidácia propylénu v plynnej fáze Selective oxidation of propylene in gas phase	Hronec Milan
Tomčalová Anna	Syntéza karbazolu z difenylamínu Synthesis of carbazole from diphenylamine	Hronec Milan

Tomčík Matej	Štúdium prípravy aminoéterov ako katalyzátorov pri výrobe polyuretánov Study of preparation of aminoether catalysts for manufacturing of polyurethane	Kaszonyi Alexander
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## VIII. PUBLICATIONS

### Chapter or pages in book

- [1] KASZONYI, A.: Oxid uhlíčitý a energia z ekologických zdrojov- úloha biokomponentov. In: Život okolo nás očami chemika a biológa. - : Vydavateľstvo STU v Bratislave. - ISBN 978-80-227-2707-5. - p. 65-74. (in Slovak)

### Article in journal

- [1] KLEPÁČOVÁ, K., MRAVEC, D., KASZONYI, A., BAJUS, M.: Etherification of glycerol and ethylene glycol by isobutylene. In: Applied catalysis A. - ISSN 0926-860X. - General 328 (2007), p. 1-13. (in English)
- [2] HORVÁTH, B., HRONEC, M., GLAUM, R.: Epoxidation of propylene in the gas phase. In: Topics in Catalysis. - ISSN 1022-5528. - 46-1/2 (2007), p. 129-135. (in English)
- [3] SLOBODNÍK, M., HRONEC, M., CVENGROŠOVÁ, Z., BEJBOVÁ, M., ČEJKA, J.: Synthesis of pyridines over zeolites in gase phase. In: Collection of Czechoslovak Chemical Communications - ISSN 0010-0765. - 72-5/6 (2007), p. 618-628. (in English)
- [4] ŠTOLCOVÁ, M., LITTERSCHEID, C., HRONEC, M., GLAUM, R.: Bimetallic orthophosphate and pyrophosphate catalysts for direct oxidation of methane to formaldehyde. In: Studies in Surface Science and Catalysis. - 167 (2007), p. 37-42. (in English)
- [5] VLČKO, M., CVENGROŠOVÁ, Z., HRONEC, M., PRASERTHDAM, P.: Gas-phase dehydrocyclization of diphenylamine. In: Applied catalysis A. - ISSN 0926-860X. - General 328 (2007), p. 183-188. (in English)
- [6] KOSTRAB, G., LOVIČ, M., JANOTKA, I., BAJUS, M., MRAVEC, D.: Terc-butylation of toluene with isobutylene over catalysts: Influence of water. In: Applied catalysis A. - ISSN 0926-860X. - General 323 (2007), p. 210-218. (in English)
- [7] KOSTRAB, G., LOVIČ, M., JANOTKA, I., BAJUS, M., MRAVEC, D.: Terc-butylation of toluene with isobutylene over catalysts: Influence of water. In: Applied catalysis A. - ISSN 0926-860X. - General 323 (2007), p. 210-218. (in English)

### Article in conference proceedings

- [1] KASZONYI, A., ŠTOLCOVÁ, M., LELOVSKÝ, M.: Condensation reactions of glycerol and urea. In: 43rd International Petroleum Conference, September 25 - 26, 2007, Bratislava. - ISBN 978-80-69736-1-3. - nestr. (in English),
- [2] MRAVEC, D., KLEPÁČOVÁ, K., KASZONYI, A., BAJUS, M.: Etherification of glycerol with catalysed by ion exchanged resins. In: Oleochemicals under Changing Global Conditions, 25-27 February, Hamburg, Germany. - nestr. (in English)
- [3] MRAVEC, D., KLEPÁČOVÁ, K., KASZONYI, A., BAJUS, M.: Etherification of glycerol with isobutylene catalysed by ion-exchange resins : Book of Abstracts. In: Oleochemicals under Changing Global Conditions, 25-27 February, Hamburg, Germany. - p. 7. (in English)
- [4] MRAVEC, D., KLEPÁČOVÁ, K., KASZONYI, A., BAJUS, M.: tert-Butylation of Glycerol: Kinetic study : CD Book of abstracts,. In: 43rd International Petroleum Conference, September 25 - 26, 2007, Bratislava. - ISBN 978-80-69736-1-3. - nestr. (in English)
- [5] RAKOTTYAY, K., KASZONYI, A.: Oxidation of Cyclohexylamine over Modified Alumina. In: 43rd International Petroleum Conference, September 25 - 26, 2007, Bratislava. - ISBN 978-80-69736-1-3. - nestr. (in English)
- [6] ŠTOLCOVÁ, M., BOROŠ, T., KASZONYI, A., JORÍK, V.: Oxidation of bioglycerol over palladium-bismuth catalysts supported on a strong cationic resin. In: 43rd International Petroleum Conference, September 25 - 26, 2007, Bratislava. - ISBN 978-80-69736-1-3. - O62-1 - O62-7. (in English)
- [7] HORVÁTH, B., HRONEC, M.: Direct epoxidation of propylene over nanostructured iron silicate catalysts : 26-31 Aug. Turku/Abo, Finland. In: EUROPACAT VIII, August 28-31, 2007, Turku/Abo, Finland. - P15-40. (in English)
- [8] HORVÁTH, B., HRONEC, M.: Nanostructured iron containing catalysts for epoxidation of olefines : Prague, Nov. 5-6. In: XXXIX Symposium on Catalysis, November 5-6, 2007, Prague, Czech Republic. - p. 19-20. (in English)
- [9] KREJČOVÁ, B., HRONEC, M., ŠTOLCOVÁ, M.: Gas-phase oxidation of 3-picoline using heteropolyacids. In: XXXIX Symposium on Catalysis, November 5-6, 2007, Prague, Czech Republic. - p. 23-24. (in English)
- [10] ŠTOLCOVÁ, M., LITTERSCHEID, C., HRONEC, M., GLAUM, R.: Bimetallic orthophosphate and pyrophosphate catalysts for direct oxidation of methane to formaldehyde : Natal, Brazil, May 27-31, 2007, Book of abstracts. In: 8th Natural Gas Conversion Symposium. - p. 299
- [11] ŠTOLCOVÁ, M., LITTERSCHEID, C., HRONEC, M., GLAUM, R.: Direct oxidation of methane to oxygenates over M(II)-M(III)-phosphates : From Theory to Industrial Practice. In: EUROPACAT VIII, August 28-31, 2007, Turku/Abo, Finland. - P10-4. (in English)

## DEPARTMENT OF PETROLEUM TECHNOLOGY AND PETROCHEMISTRY

### Head of Department:

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## I. STAFF

### Full Professors:

Martin Bajus, DSc;

### Associate Professors:

Pavol Daučík, PhD; Pavol Hudec, PhD; Agáta Smiešková, PhD; Zdenek Židek, PhD;

### Assistant Professors :

Elena Hájeková, PhD;

### Research Fellows:

Hadvinová Marcela;

### PhD Students:

Michal Horňáček; Božena Mlynková;

### Technical staff:

Dagmar Machatová; Marta Olléová

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Catalysts Characterization  
Laboratory of High Pressure Reactors  
Laboratory of Gas and Liquid Chromatography  
Laboratory of Chemistry and Analysis of Fuels  
Laboratory of Pyrolysis  
Laboratory of Thermal Cracking and Copyrolysis of Polymer Wastes  
Laboratory of Petrochemistry  
Laboratory of Rheology of Lubricants  
Laboratory of Infra-Red Spectroscopy  
Laboratory of Natural Gas Conversion

### B. Research laboratories:

Laboratory of Catalysts Characterization  
Laboratory of High Pressure Reactors  
Laboratory of Gas and Liquid Chromatography  
Laboratory of Chemistry and Analysis of Fuels  
Laboratory of Pyrolysis  
Laboratory of Petrochemistry  
Laboratory of Rheology of Lubricants  
Laboratory of Infra-Red Spectroscopy  
Laboratory of Natural Gas Conversion

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Energy Technologies and Materials	2/2/0	Bajus, Hájeková
<b>3. semester (Bc)</b>	Equipments of Chemical Technology	2/0/0	Smiešková
<b>1. semester (MSc)</b>	Technology of Crude Oil	3/0/0	Židek, Daučík
	Analysis of Petroleum Products	2/0/0	Daučík, Židek
	Combustion Processes	1/2/0	Smiešková
	Refinery and Petrochemical Plants	1/2/0	Daučík
	Laboratory practice I	0/0/8	Daučík, Židek
<b>1. semester (MSc)</b>	Catalysis	0/1/0	Hudec

<b>2. semester (MSc)</b>	Catalytic and Thermal Processes in Crude Oil Treatment	2/0/0	Židek, Smiešková
	Alternative Fuels	2/0/0	Bajus, Hájeková
	Lubricants in Tribology	2/0/0	Hájeková, Daučík
	Kinetic and Reactors	0/2/0	Hudec
<b>2. semester (MSc)</b>	Laboratory practice II	0/8/0	Hudec
<b>3. semester (MSc)</b>	Petrochemistry	3/0/0	Bajus, Hudec
	Gas Industry	2/0/0	Hudec, Daučík
	Laboratory practice III	0/0/10	Hudec, Židek

#### IV. CURRENT RESEARCH PROJECTS

##### **VEGA project No 1/3587/06 Alternative feedstocks in hydrocarbon technologies in the production of ecological fuels and petrochemicals (Martin Bajus)**

The subject of the scientific project was the study of reaction kinetics of the thermal and catalytic transformations of the alternative feedstocks over heterogeneous catalysts in hydrocarbon technologies by chemical recycling of waste polyethylene (LDPE) and polypropylene (PP) to desired alkenes; pyrolysis of used tyres; the utilization of glycerol as an alternative feedstock of biogenic origin by etherification with C<sub>4</sub>-fraction to ethers of glycerol suitable as oxygenate additives to diesel fuel.

Project duration: from 01. 01. 2006 to 31. 12. 2008

##### **APVV Project No. 20-036705 The use of waste polymer and oil materials in production of bitumen (Pavol Daučík)**

The project deals with using of waste polymers, waste rubber as modifiers along with waste oil in asphalt compositions. The aim is to find correlation between composition and use properties of system asphalt - polymer - waste oil. Based on study of polymer and waste rubber` structure's influence on properties of modified asphalts, the possibility of industrial use of waste polymers and rubber will be assessed. The possibility of mixing of waste materials with fresh SBS and EVA copolymers in production of asphalt. Study of possible use of waste oil is focused on production of fluxing agents, used in production of blown asphalts. Most modern separation (LC, GPC), spectral (NMR, IR) and thermal (DSC) methods along with rheological testing will be deployed for characterization of asphalt, polymer and waste's composition.

Project duration: from: 01.03. 2006 to 31. 12. 2008

##### **VEGA project No 1/3575/06 Possibilities of treatment of liquid and solid hydrocarbon wastes in catalytic cracking processes of petroleum fractions treatment – fluid catalytic cracking and hydrocracking to fuels. Modification and characterization of zeolites and zeolite catalysts for these processes (Assoc. Prof. Agáta Smiešková PhD.)**

The project deals with the study of the treatment of liquid and solid waste hydrocarbons – waste oils and plastics – in catalytic cracking processes of treatment of petroleum fractions: fluid catalytic cracking and hydrocracking mainly to fraction of motor fuels – gasoline and diesel fuel. The work comprises modification and characterization of zeolites and zeolite catalysts for hydrocracking (HC) and fluid catalytic cracking (FCC), treatment of liquid and solid waste hydrocarbons to fraction suitable for above-mentioned catalytic processes, laboratory catalytic tests FCC (MAT – Micro-Activity Test according to ASTM standard) and HC (laboratory flow pressure reactor) with industrial feeds additivated with treated waste hydrocarbon fractions in suitable ratio, as well as developing of methods to evaluate properties of prepared motor fuels.

Project duration: from 01. 01. 2006 to 31. 12. 2008

#### VI. COOPERATION

##### **A. Cooperation in Slovakia**

Institution	Type of cooperation	Responsible person	Duration
SLOVNAFT, j.s.co., Bratislava		Židek, Daučík	from 1990
Bio Plus	MERO, Renewable sources	Bajus	from 2003
TRANSPETROL, j. s. co., Bratislava	Evaluation of crude oil	Daučík	from 2000



VÚRUP, j. s. co., Bratislava		Hudec, Daučík	from 1989
DRON - Sklady, Ltd. co.	Recycling of polymer waste	Bajus	
Slovak Academy of Science, Institute of Polymers, Bratislava		Bajus	
Institute of Chemistry, Faculty of Natural Sciences, Comenius University, Bratislava	Characterization of silica aerogels	Hudec	from 1998
Department of Nuclear Physics and Technology, Faculty of Electrical Engineering, Bratislava	Moessbauer spectroscopy of Fe-modified zeolites	Hudec	from 1997

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
ABO – University, Finland	Modification and characterization of zeolites and their application in izomerization reactions	Hudec	from 2001
University of Calgary, Canada	Determination of physical properties and chemical structure of polymer modified bitumens	Daučík	from 2000
Institute of Physico-Chemistry and Electrochemistry, Academy of Sciences, Prague, Czech Republic	Evaluation of adsorption properties of zeolites	Hudec.	from 1997

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Daučík Pavol	Slovak Society of industrial Chemistry	member	
Hájeková Elena	Slovak Society of industrial Chemistry	member	01. 01. 1994
Hudec Pavol	Slovak Society of industrial Chemistry	member	
Smiešková Agáta	Slovak Society of industrial Chemistry	member	
Židek Zdenek	Slovak Society of industrial Chemistry	member	
Daučík Pavol	Slovak institute of technical normalization	member	30. 04. 2001
Daučík Pavol	Examining board in the field of oils	member	29. 11. 2001
Hudec Pavol	Slovak zeolite association at SSPCH	chairman	01. 01. 2001
Smiešková Agáta	Slovak zeolite association at SSPCH	member	
Židek Zdenek	Slovak zeolite association at SSPCH	member	
Hudec Pavol	Slovak Society of Chemical Engineering	member	
Smiešková Agáta	Slovak Society of Chemical Engineering	member	
Židek Zdenek	Slovak Society of Chemical Engineering	member	

## E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Narendra Kumar	ABO University, Turku	Finland	September 25 – 26, 2007

## F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Bajus M.	8th Natural Gas Conversion Symposium	Brazil	27.-31.5.2007
Hornáček M.	ABO University, Turku, 6month stage	Finland	1.9.2007-28.2.2008
Hudec P.	XIV Forum Zeolitowe, Kocierz	Poland	16.*21..9.2007
Hudec P.	XXXVIII Symposium on Catalysis, Prague	ČR	5.-6.11.2007
Hudec P.	EUROPACAT-VIII, TURKU	Finland	26.-31.8.2007
Smiešková A.	XXXVIII Symposium on Catalysis, Prague	ČR	5.-6.11.2007
Smiešková A.	XIV Forum Zeolitowe, Kocierz	Poland	16.*21..9.2007

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Zuzana Spevářová	Low Temperature Properties of Diesel Fuels with Fatty Acid Esters	Daučík P.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Martin Čeppan	Group Composition of Asphalts. Determination of Reproducibility of Separation	Daučík P.
Silvia Fáberová	Coke Formation During Copyrolysis of the Mixed Plastics with Naphtha	Hájeková E.
Katarína Gavalcová	IR-Spectra of Acid Centers of Zeolites	Hudec P.
Marcela Koželuňová	Separation and Analysis of the Products from Thermal Cracking	Bajus M.
Jaroslav Šenkár	Hydrocracking of Waste Hydrocarbon Fractions	Hudec P.

## VIII. PUBLICATIONS

### Article in journal

- [1] BAJUS, M.: Advances in Hydrocarbon Technologies. In: Petroleum and Coal. - ISSN 11335-3055. - 49-2 (2007), nestr. (in English)
- [2] FOLDESOVÁ, M., HUDEC, P., DILLINGER, P.: Chemically modified zeolites : surfaces and interaction with Cs and Co. In: Petroleum and Coal. - ISSN 11335-3055. - 49-2 (2007), p. 63-66. (in English)
- [3] FOLDESOVÁ, M., HUDEC, P.: Study of Surface Properties of Slovak Natural Zeolite-Clonoptilolite by Physical Adsorption of Nitrogen (Štúdium povrchových vlastností slovenského prírodného zeolitu-klinoptilolitu fyzikálnou adsorpciou dusíka). In: Petroleum and Coal. - ISSN 11335-3055. - 49-1 (2007), p. 34-40. (in Slovak)
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### Research Fellows:

Assoc. Prof. Viera Khunova, PhD. (Senior Research Fellow), Peter Bugaj (since 1.10.2007); Jozef Feranc (since 1.10.2007), Zuzana Kramárová (until 30.4.2007)

### PhD Students:

Peter Bugaj (until 30.9.2007); Denisa Bellušová (since 1.10.2004); Jozef Feranc (until 30.9.2007); Zuzana Kramárová (until 30.4.2007); Pavol Lukáč (until 1.10.2007); Anna Naháľková (since 1.10.2005); Lucia Vodná (until 30.9.2007); Amir Hssan (since 1.10.2006); Mlynský Tomáš (since 1.10.2006); Szabová Renáta (since 1.10.2006); Vašková Ida (since 1.10.2006)

### Technical staff:

Viera Godályová, Mária Pekarovičová, Anna Tatarková, Emil Tvarožek

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Polymer Synthesis  
Laboratory of Polymer Processing  
Laboratory of Polymer Testing  
Polymer Processing Centre

### B. Research laboratories:

Laboratory of Polymer Solutions  
Laboratory of Polymer Modification  
Laboratory of Thermal Analysis  
Laboratory of Polymer Rheology  
Laboratory of Electron Microscopy  
Laboratory of Polymer Processing and Estimation of its Properties  
Laboratory of Biomaterials  
Laboratory of Plasma Technology

## III. TEACHING

### A. Undergraduate Study: Chemical Technology

<b>5. semester (Bc)</b>	Macromolecular Chemistry	2/0/0	Chrástová
	Corrosion and Material Surface Treatment	2/0/2	Chovancová, Hudec
<b>6. semester (Bc)</b>	Technology of Materials	2/0/0	Hudec, Marcinčin, Majling
	Semestral Project	0/4/0	
	Production, Properties and Processing of Plastics	2/0/0	Hudec (for students of Faculty of Architecture)
	<b>Program: Polymeric Materials</b>		
<b>1. semester (MSc)</b>	Polymer Physics	2/2/0	Chodák
	Colloids and Interfaces	2/1/0	Bakoš, Reháková
	Macromolecular Chemistry II.	2/1/0	Chrástová
	Production and Processing of Plastics	3/0/0	Hudec
	Production and Processing of Rubber	3/2/0	Kyselá

	Laboratory of Polymer Synthesis	0/0/8	Černáková
<b>2. semester (MSc)</b>	Additives for Plastics	2/0/0	Hudec
	Methods of Polymer Characterisation	2/0/0	Černáková
	Biotechnological Polymers	2/0/0	Bakoš
	Design of Experiments	1/1/0	Alexy
	Laboratory from Production of Polymers	0/0/8	Alexy, Kyselá
<b>3. semester (MSc)</b>	Polymer Processing	3/1/0	Špírk
	Polymer Blends and Composites	2/0/0	Khunová
	Polymer Recycling and Waste Disposal	2/0/0	Hudec, Khunová, Špírk
	Polymer Testing	0/2/0	Alexy
	Laboratory of Polymer Processing	0/0/10	Alexy, Hudec
<b>4. semester (MSc)</b>	Diploma work	0/0/27	

### B. Undergraduate Study: Technology of Polymer Materials

<b>1.semester ( Bc)</b>	Seminar - Project I.	0/1/0	Bakoš
	Fundamentals of Polymer Processing	2/0/0	Hudec
<b>2.semester ( Bc)</b>	Macromolecular Chemistry	2/0/0	Chrástová
	Seminar – Project II.	0/4/0	Bakoš
<b>4.semester ( Bc)</b>	Plastic and Rubber	2/1/0	Hudec
	Seminar – Project III.	0/2/0	Bakoš
<b>5.semester</b>	Seminar – Project IV.	0/3/0	Bakoš

### C. Undergraduate Study: Plastics in Mechanical engineering and Technologies of Plastics Processing

<b>2.semester ( Bc)</b>	Annual Project	0/3/0	Bakoš
<b>3.semester ( Bc)</b>	Macromolecular Chemistry	2/0/0	Chrástová
	Production and Processing of Plastics	3/1/0	Hudec
	Polymer Testing	0/2/3	Alexy
	Analytical Chemistry of Plastics I	2/1/0	Černáková
<b>4.semester ( Bc)</b>	Analytical Chemistry of Plastic II	0/0/3	Černáková
	Polymer Physics	2/2/0	Chodák
	Injection molding, extrusion and blow molding	2/2/0	Špírk
	Annual Project	0/4/0	Hudec
<b>5.semester ( Bc)</b>	Corrosion and Material Surface Treatment	2/0/2	Chovancová, Hudec
	Additives for polymers	2/0/0	Hudec
	Laboratory from Processing of Polymers	0/0/5	Alexy
<b>6.semester (Bc)</b>	Polymer Recycling and Waste Disposal	2/0/0	Hudec
	Project	0/0/7	Hudec
<b>7.semester (MSc)</b>	Polymer Physics II	2/0/1	Chodák
	Production and Processing of Plastics	2/0/1	Hudec
	Laboratory I	0/0/7	Alexy

## IV. CURRENT RESEARCH PROJECTS

### 1. VEGA Project 1/2110/05, Polymer nanocomposites based on polyolefines, carbon nanotubes and layered silicate ( Viera Khunová)

The project is aimed to develop advanced polymer nanocomposite materials with high barrier properties and electrical conductivity based on polyolefines, carbon nanotubes and layered silicates. Development of clay surface modification technologies in order to maximise interphase interactions and performance of composites.

Determination of filler/modifier and modifier/polymer interphases. Exploration of the role of interfacial modification on the structure and physico-mechanical properties of composites. Optimisation of reactive processing conditions to achieve the highest degree of filler dispersion and exfoliation. Explanation of the knowledges related to the multifunctional influence of physical and chemical characteristics of filler and modifier, as well as reactive processing conditions on the structure and end-use properties of studied materials. Identification of filler surface modification rate by application of competitive effective compounds.

Project duration: from 01. 01. 2005 to 31. 12. 2007

## **2. VEGA Project 1/4095/07, Atmospheric-pressure plasma treatment of material surfaces (Ludmila Černáková)**

The project is aimed to physical and chemical modification of surface properties of polymer materials by plasma activation at atmospheric pressure. The aim of the project is to gather a new knowledge above basic plasma-chemical interactions, which proceeds on the surface of materials in the course of their plasma activation. The obtained experiences will be applied at the preparation of the new materials with tailor-made properties.

Project duration: from 01. 01. 2007 to 31. 12. 2009

## **3. VEGA Project 1/4455/07, Atmospheric-pressure plasma treatment of material surfaces (Pavol Alexy)**

Project is focused on study of influence of physical and chemical modification of polymer blends and composites on their properties. Thermoplastic and elastomer systems are modified by affection of interaction on interphase polymer-polymer, polymer-filler respectively. Main interest is focused on biodegradable polymers, preferably from renewable sources. Selection of polymeric matrixes and others components as well as methods of preparation and modification of blends respect the main aim – to obtain new knowledge resulting in description of connection between composition, structure and multiphase systems and their properties. Obtained knowledge will be quantified using methods of modelling of dependences between properties and coherent parameters. Consequently the system for optimisation of condition for preparation of studied polymer blends with respect to specified properties will be proposed.

Project duration: from 01. 01. 2007 to 31. 12. 2009

## **4. APVT Grant Agency, Project APVT-099-035004, Fibrous and Textile Surface Nanostructural Modification (Ivan Hudec)**

The aim of project is study of surface modification of fibrous and textile materials by atmospheric plasma in various gases grafting of monomers or nano-scale layers on textile surface after activation by plasma.

Project duration: from 2005 to 2007

## **5. APVT Grant Agency, Project in Frame of Program Eureka EURB-0013-06, Ecological Liquidation of Rubber Waste by Mobile Equipment (Ivan Hudec)**

The main aim of the project is construction of functional model of prototype of mobile equipment for rubber waste liquidation by pyrolysis process or pyrolysis similar technologies. Achievement of the main aim assumes of the following partial aims - evaluation of composition, chemical parameters and potencial application of products created during pyrolysis process of rubber waste using of laboratory model prototype.

Project duration: from 2007 to 2009

**6. APVT Grant Agency, Project APVV–099-038805, Application of the Method of the Design of Experiments (DoE) and Mathematic-Statistical Procedures in the Formulation of the Recipes of Rubber Compounds (Pavol Alexy)**

The aim of the project is creation of optimizing system for rubber blends formulation based on application of DoE methodology output.

Project duration: from 2006 to 2008

**7. Project of Applied Research of ME SR , 4/0003/05 The Study of Nano- modification of Surfaces of Reinforcing Materials using Plasma on their Adhesion to Rubber ( Ivan Hudec)**

Objective of the project is to improve adhesion properties of reinforcing materials to rubber after plasma activation at atmospheric –pressure.

Project duration: from 2005 to 2007

**8. Project of ME SR No 661/2003 Preservation, Stabilization and Conservation of Traditional Information Supports in the Slovak Republic (Dušan Bakoš)**

Objective of the State Program Project is live prolonging of endangered paper documents in libraries and archives in SR, as well as assorting of books according to historical and technological criteria with livesaving of documents. In the experimental part of the project, the study is focused on an experimental evaluation of new technologies and objective comparing known and new technologies with the development of experimental base for research and education in the field of book and documents preservation.

Project duration: from 2003 to 2008

**9. Project No 2-3-5 CHN, New Biomaterials Based on Chitosan Complexes (Dušan Bakoš).**

Target of the project is complexation of natural polymers to set-up a new tissue-engineered multi-functional composite products that are successful in three-dimensional tissue regeneration as being biologically active, biodegradable, heterogenous, anisotropic structures. The research activity will be based on highly innovative technological processes and biopolymers (chitosan, hyaluronan and starch). Special nano-technologies for natural polysaccharide-based polymers will be used to optimise the materials morphological development and consequent mechanical and degradation behaviour and to tailor their in vivo performances.

Project duration: from 2007 to 2008

**10. SUSTAINPACK, Integrated Project 6FP, Sustainable development in the innovative fibre based packaging value chain (Dušan Bakoš)**

Objective of the Project is to improve the competitiveness of fibre-based packaging through the development and application of nanotechnologies in order to reduce supply chain costs or add functionality. Participating in two subprojects: SP1 – Fibre based packaging value chain and SP3 – Fibre based composite packaging.

Project duration: from 2004 to 2007

**11. Project of ME SR, MVTS Nem/SR/STU/07 , Composite Materials based on Rubber with Magnetic Fillers (Ivan Hudec)**

The project is concerned on composite materials based on rubber with magnetic fillers and study of influence of surface modification by plasma on the properties of materials which applied in rubber products.

Project duration: from 2007 to 2009



## 12. Project of ME SR, MVTS Nem/SR/STU1/07, Polymer blends and composites based on biopolymers and biodegradable polymers (Pavol Alexy)

Subject of project is study of properties of polymer blends and composites based on plastics as well as elastomers, which contain biopolymer or biodegradable polymer. In part of plastics, project is focused to development of new, ecological friendly materials, particularly for packaging. Utilisation of polymers from renewable sources is main aim of this part of the project. In case of elastomers, project is preferably focused on new possibilities of modification of rubber blends with aim to obtain new materials with special and specific properties

Project duration: from 2007 to 2009

## 13. Project KEGA 3/5200/07, Hypertext textbook Plastics – technical Materials (Pavol Alexy)

Electronic text book “Plastics – technical materials” are dedicated for students of all three degrees of study, oriented to thermoplastic. It describes and explains basic relation and objective causality, which are determining properties as well as physical- mechanical properties. The main aims are to create on-line hypertext system with possibility of active participation on lectures.

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Matador Rubber, s.r.o. Púchov	Evaluation of the properties of textile reinforcing materials and rubber blends for construction of tyres	Hudec	2007
Matador Rubber, s.r.o. Púchov	Modification of traction properties of sports tyres	Hudec	2007
CHEMOSVIT FOLIE, a.s. Svit	Surface Modification of Packaging Films by Plasma	Hudec	2007
VUCHT, Bratislava	Modification of particulate polymer composites by reactive modifiers	Khunová	2007

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Martin Luther University of Halle-Wittenberg, Institute of Materials Science, Halle, Germany	Modification of reinforcing materials for rubber articles, New types of fillers for rubber blends	Radusch Hans-Joachim, professor, Gesauer Str., Halle-Wittenberg, D-06099 Halle(Saale), Germany	since 2002
Technical University of Szczecin, Institute of Material Engineering, Szczecin, Poland	Chemical and physical modification of polymers	Tartakowski Zenon, professor, al. Piastow č. 19, Szczecin, Poland	since 1996
Academia Rolniczna, Krakow, Poland	Biopolymers	Tomasik Piotr, professor Krakow, Poland	since 2005
Institute of Macromoleculare Chemistry, Academy of Science of the Czech Republic, Prague, Czech Rep.	Polymer nanocomposites	Kelnar Ivan, senior research fellow, Academy of Science, Praque, Czech Republic	since 2001
International Clinic for Neo-Organs, Roma, Italy	Biomaterials development	Letič Gavrilovič Anka, professor, International Clinic for Neo-Organs, Roma, Italy	since 1999
The Manchester Metropolitan University, Faculty of Science and Engineering, Manchester, UK	Reactive processing of particulate polymer composites	Liauw C.M., senior research fellow, Chester str., Manchester M1 5GD, UK	since 1996
University of Minho, Department of Polymer Engineering, Guimarães, Portugal	Development of composites, polymer processing	Antonio Cunha, professor, University of Minho, Guimaraes, Portugal	since 1999

University of Pisa, Department of Chemistry and Industrial Chemistry, Pisa, Italy	Biodegradable polymers	Chiellini Emo, professor, Via Risorgimento 35, 56126 Pisa, Italy	since 1999
Department of Macromolecular Science, Fudan University, Shanghai, China	New biomaterials based on chitosan complexes	Wei Zhong, associate professor, 220 Handan Road, Shanghai 200433, P.R. China	since 2002
Institute of Materials Technology, Poznań University of Technology, Poznań, Poland	Testing of adhesion properties of reinforcing materials to rubber	Szostak Marek, associate professor, ul. Piotrowo 3, 61-138 Poznań, Poland	since 2001
German Rubber Research Institute, Hannover, Germany	Composite materials based on rubber matrix and magnetic fillers	Robert H. Schuster, professor, Eupener Str.33, D-305 19 Hannover	Since 2006

#### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Bakoš Dušan	European Biomaterial Society	member	since 1995
Alexy Pavol	Polymer Processing Society	member	2005 - 2006
Hudec Ivan	IRCO	member	since 2005
Hudec Ivan	VDI The Association of German Engineers Membership Division	member	since 2007

#### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Wei Zhong	Fudan University	China	August 2007 (10 days)
Robert H. Schuster	DIK Hannover	Germany	May 2007 (3 days)
Hans Joachim Radusch	MLU Halle/ Merseburg	Germany	May 2007 (4 days)
Mohini M. SAIN	University of Toronto	Canada	May 2007 (4 days)
Gert Heinrich	Leibnitz Institut Dresden	Germany	May 2007 (3 days)
Rex P. HJELM	Los Alamos Neutron Science Center	USA	May 2007 (3 days)
Marek SZOSTAK	Poznan University of Technology	Poland	May 2007 (2 days)
Miroslav MANAS	Tomas Bata University of Zlin	Czech Republic	May 2007 (2 days)
Zenon TARTAKOWSKI	Politechnika Szczecinska	Poland	May 2007 (4days)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Hudec I.	Gottferd Centrum Buchen	Germany	April 2007,(1 day)
Alexy P.	Gottferd Centrum Buchen	Germany	April 2007, (1 day)
Černáková, L.	16 <sup>th</sup> International Colloquium on Plasma Processes, Symposium, Toulouse	France	June 2007, (5 days)
Hudec I.	Conference Deformation von Kuststoffen, Mesreburg	Germany	Juni 2007, (4 days)
Alexy P.	Conference Deformation von Kuststoffen, Mesreburg	Germany	Juni 2007, (4 days)
Hudec I.	University of Leoben	Austria	July 2007,(1 day)

Hudec I.	11 <sup>th</sup> International Seminar on Elastomers, Freiburg	Germany	September 2007, (5days)
Alexy P.	11 <sup>th</sup> International Seminar on Elastomers, Freiburg	Germany	September 2007, (5days)
Amir I.	11 <sup>th</sup> International Seminar on Elastomers, Freiburg	Germany	September 2007, (5days)
Fernc J.	11 <sup>th</sup> International Seminar on Elastomers, Freiburg	Germany	September 2007, (5days)
Amir I.	11 <sup>th</sup> International Rubber Symposium Zlín	Czech Republic	September 2007, (2 days)
Alexy P.	11 <sup>th</sup> International Rubber Symposium Zlín	Czech Republic	September 2007, (2 days)
Černáková L.	5 <sup>th</sup> CEC 2007, Fibre-grade Polymers, Chemical Fibres and Special Textiles, Krakow	Poland	September 2007 (4 days)
Szabová R.	5 <sup>th</sup> CEC 2007, Fibre-grade Polymers, Chemical Fibres and Special Textiles, Krakow	Poland	September 2007, (4 days)
Hudec I..	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Nahálková A.	Kunststoffe 2007 Dusseldorf	Germany	October 2007,, (5 days)
Bugaj P.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Szabová R.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Wolfová M.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Kruželák J.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Mlynský T.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Oravcová A.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Amir I.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Vašková I.	Kunststoffe 2007 Dusseldorf	Germany	October 2007, (5 days)
Hudec I.	International Rubber Conference 2007 Cleveland	USA	October 2007, (9 days)
Hudec I.	DIK Hannover	Germany	November 2007, (2 days)
Kruželák J..	DIK Hannover	Germany	November 2007, (2 days)
Černáková L.	Second Workshop&Training School on Low Cost Applications of Plasma Technology in Industry and Environment, Cairo	Egypt	November 2007, (5 days)

#### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Jaššo, M.	Composite materials with magnetic properties for intelligent tyres	Urogiová, E.
Ebnerová, M.	Possibilities of computer simulation of injection process	Ulík, J.
Hodoň, J.	The influence of plastic waste content on plastics properties	Gondár, E.
Kratochvíla, J.	The possibilities of utilization of plastic waste in injection moulding technology	Hudec, I.
Krošlák, M.	Multicomponent biodegradable polymer blends	Alexy, P.
Rusňák, J.	Testing of mechanical properties of elastomers applied in automotive	Malíková, M.
Tomanová, K.	Study of properties of polyethylene welds	Gondár, E.
Včelka, J.	The analysis of materials properties in technology of injection moulding of bumpers	Hudec, I.

## B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title o Thesis	Supervisor
Budošová, J.	The possibility of surface modification of plastics for increasing adhesion	Hudec, I.
Fuleová, V.	Biodegradable polymer blends	Alexy, P.
Hajšová, M.	Influence of natural fillers on properties of rubber blends	Alexy, P.
Jakubcová, L.	Study of influence of modified starch on properties of PVAL blends	Alexy, P.
Kof, M.	Filler activity in rubber blends	Kramárová, Z.
Kruželák, J.	Study of elastomeric magnetic composites properties	Kyselá, G.
Lobbová, M.	Surface properties of plastic bumpers after individual technological operations	Hudec, I.
Oravcová, A.	Preparation and properties of polymer cement concretes	Hudec, I.
Šútor, Ľ.	Study of influence of magnetic fillers on properties of composites	Hudec, I.
Úlehlová, J.	Preparation and properties of the modified chitosan membranes	Bakoš, D.
Wetterová, Z.	Influence of modification on properties of polymer nanocomposites based on clay minerals	Khunová, V.
Wolfová, M.	Surface plasma-chemical modification of textile materials	Černáková, Ľ.

## C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Amir, I.	Influence of plasma on properties of reinforcing materials and rubber mixture	Hudec, I.
Szabova, R.	Plasma-chemical surface modification of polymer material	Černáková, Ľ.
Kruželák, J.	Composite materials with magnetic fillers	Hudec, I.
Vašková, I.	Biodegradable packaging materials based on multicomponent polymeric matrix	Alexy, B.
Kalinovská, L.	Development of biodegradable capsules for controlled releasing of biological active substances	Bakoš, D.
Wolfová, M.	Surface modification of polymer materials after plasma activation	Černáková, Ľ.
Mlynský, T.	New types of packaging materials based on nanocomposites	Khunová, V.
Oravcova, A.	Surface modification of polymer materials by plasma	Hudec, I.

## VIII. PUBLICATIONS

### Article in journal

- [1] AMIR, I., HUDEC, I., ŠIROKÝ, J.: Structural Characteristics of Rubber and Adhesion Properties of Textile Cords to Rubber. In: Chemické listy. - ISSN 0009-2770. - 101-1 (2007), p. 41. (in English)
- [2] BELLUŠOVÁ, D., ALSSUTH, T., SCHUSTER, R., ŠEPELÁK, V., MYNDYK, M., HUDEC, I.: Preparation and Properties of Ferrite Powders for Rubber Composites. In: Chemické listy. - ISSN 0009-2770. - 101-1 (2007), p. 33. (in English)
- [3] HUDEC, I., UHER, M., GAŠPERÍK, J.: Prof.RNDr. Juraj Gašperík - zakladateľ chémie a technológie polymérov. In: Petroleum and Coal. - ISSN 11335-3055. - 49-1 (2007), p. 73-78. (in Slovak)
- [4] KELNAR, I., KHUNOVÁ, V., KOTEK, J., KAPRÁLKOVÁ, Ľ.: Effect of clay treatment on structure and mechanical behavior of elastomer-containing polyamide 6 nanocomposite. In: POLYMER The International Journal for the Science and Technology of Polymers. - ISSN 0032-3861. - 48 (2007), p. 5332-5339. (in English)
- [5] KHUNOVÁ, V., KELNAR, I., DUCHOŇ, M., SIMON, P., TUREKOVÁ, I., BALOG, K.: Effect of Nanoclays on the Flame Retardancy of Polymer Nanocomposites. In: Chemické listy. - ISSN 0009-2770. - 101-1 (2007), p. 22-23. (in English)
- [6] SZABOVÁ, R., KRUŽELÁK, J., BELLUŠOVÁ, D., KYSELÁ, G., HUDEC, I.: Cross-linked elastomeric composites with magnetic properties. In: Chemické listy. - ISSN 0009-2770. - 101-1 (2007), p. 62. (in English)
- [7] ŪRÖGIOVÁ, E., HUDEC, I., BELLUŠOVÁ, D., ŠURI, P.: Structure and Properties of Rubber Blends with Ferromagnetic Fillers. In: Polymers for Advanced Technologies. - ISSN 1042-7147. - 18 (2007), p. 128-134. (in English)
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- [9] Černáková L., Jaššo M., Szabová R., Hudec I., Černák M.: Atmospheric-pressure plasma treatment of textile materials for industrial uses, *Chem. Listy* 101, 42-43, 2007
- [10] Kramárová Z., Alexy, P., Chodák, I., Špírk, E., Hudec, I., Košíková, B., Gregorová, A., Šúri, P., Feranc, J., Bugaj, P., Ďuračka, M., : Biopolymers as fillers for rubber blends, *Polymers for advanced Technologies*, 18, 2007, p.135-140
- [11] Mikulajová A., Takáčsová, M., Alexy, P., Brindzová L. : Optimisation of extraction of phenolic components from dog-tail based on experimental design, *Chemické listy*, 101, 2007, 563-568
- [12] Bubeníková, S., Lacík, I., Bakoš, D., Vodná, L.: Chitosan polyelectrolyte complexes for use in tissue engineering and drug delivery, *J. Mat. Sci.*, 539-543, 2007, 577-582.
- [13] Vodná, L., Bubeníková, S., Bakoš, D.: Chitosan based hydrogel microspheres as drug carriers, *Macromol. Biosci.*, 7, 2007, 629-634
- [14] Palou, M., Bakoš, D., Kuzielová, E., Labuda, J.: Potential Application of Glass and Glass-Ceramics Based on Lithium Disilicate as Biomaterials, *Key Engineering Materials*, Vols. 361-363 (2008) pp. 273-276
- [15] Šimon, P., Zhong, W., Bakoš, D., Hynek, D.: Thermooxidative stability of polymethyl methacrylate containing nanoparticles of silica/titania and silica/zirconia, *Chemical Papers* 62 (2) 176–180 (2008)

### Article in conference proceedings

- [1] HUDEC, I., JAŠŠO, M., ČERNÁK, M., ČERNÁKOVÁ, L., KRUMP, H.: Adhesion Strenght Study Between Plasma Polymerized Polyester Cords and Rubber Matrix. In: *Proceedings of the sixth International Symposium on Polymer Surface Modification: Relevance to adhesion*. - p. 26. (in English), 2007
- [2] HUDEC, I., AMIR, I., ŠIROKÝ, J., JAŠŠO, M., KRUMP, H., ČERNÁK, M.: Surface Treatment of Reinforcing Materials by Plasma. In: *Proceedings of ISE'07 11th Interantional Seminar on Elastomer* - p. 85-86, 2007 (in English)
- [3] HUDEC, I., AMIR, I., ONDÁŠ, M.: Investigation of Adhesion Properties of Reinforcing Materials to Rubber. In: *Tagungsskript 11.Tagung Deformation und Bruchverhalten von Kunststoffen*. - nestr. (in English)
- [4] HUDEC, I., AMIR, I., JAŠŠO, M., KRUMP, H., ČERNÁK, M.: Surface Modification of Textile Reinforcing Materials by Plasma. In: *Proceedings of the Fall 172nd Technical Meeting of the Rubber Division ACS*. - nestr. (in English)
- [5] HUDEC, I., JAŠŠO, M., AMIR, I., ŠIROKÝ, J., ČERNÁK, M., ILLISCH, S.: The Influence of Plasma Treatment and Plasma Polymerization on Adhesion of Polyester Cords to Rubber. In: *16th Symposium of Application of Plasma Processes (SAPP XVI), Podbanské 2007*. - ISBN 978-80-89186-13-6. - p. 117-118 (in English)
- [6] JAŠŠO, M., HUDEC, I., ŠIROKÝ, J., BUČEK, A.: Surface modification of PET cords by atmospheric plasma. In: *Elastomery i Przemysl Gumowy*. - ISBN 83-917671-3-2. - p. 275-281, 2007 (in English)
- [7] Szabová, R., Černáková, L., Hudec, I., Wolfova, M., Zahoran, M., Černák, M.: Surface immobilization of TiO<sub>2</sub> nano-particles on polypropylene nonwoven, *Fibre-Grande Polymers, Chemical Fibres and Special Textiles*, 5th Central European Conference, Kraków, Poland, September 2007
- [8] Černáková, L., Szabová, R., Hudec, I., Mikula, M., Černák, M.: Surface modification of polypropylene nonwoven after plasma activation at atmospheric pressure, *Fibre-Grande Polymers, Chemical Fibres and Special Textiles*, 5th Central European Conference, Kraków, Poland, September 2007
- [9] Černák M., Kováčik D., Buček A., Černáková L., Zahoranová A., Ráhel J., Sřahel P.: Low-cost and high-speed plasma surface treatments at atmospheric pressure, *Book of Abstract, 16th Symposium on Application of Plasma Physics, SAPP XVI, Podbanské, Slovakia, January 2007* ISBN 978-80-89186-13
- [10] Černáková L., Wolfová M., Hudec I., Černák M.: Immobilisation of nano-particles onto the polymer surfaces after plasma activation, *Abstract Book, Second Workshop & Training School on Low Cost Applications of Plasma Technology in Industry and Environment, Cairo, Egypt, November 2007*
- [11] Kováčik, D., Zahoranová, A., Černáková, L., Černák, M.: Low-cost ambient air plasma treatment of polypropylene nonwovens, *Abstract Book, Second Workshop & Training School on Low Cost Applications of Plasma Technology in Industry and Environment, Cairo, Egypt, November 2007*
- [12] Kováčik, D., Zahoranová, A., Buček, A., Ráhel, J., Černáková, L., Černák, M.: Basic properties and possible applications of diffuse coplanar surface barrier discharge, *XVII.Symposium on Physics of Schwitching Arc*, sept. 10-13, 2007, Nové Mesto na Morave, Czech Republic, 129-132
- [13] Černáková, L., Tóth, A., Černák, M., Kunovská, K.: Chemical compositions of polypropylene surfaces after activation in atmospheric-pressure air and nitrogen plasmas, *16th Symposium on Application of Plasma Physics, SAPP XVI, Podbanské, Slovakia, 2007* ISBN 978-80-89186-13-6
- [14] Černáková, L., Szabová, R., Hudec, I., Černák, M.: Polypropylene nonwoven coated with chitosan, *Abstract Booklet, 16th International Colloquium on Plasma Processes, Toulouse, France, June 2007*
- [15] Alexy, P., Feranc, J., Kramárová, Z., Hajšová, M., Ďuračka, M.: Application of lignins in rubber blends, *11th International seminar on elastomers, Freiburg, Germany, 23-27. September 2007*, p. 117-118

- [16] Alexy, P., Kramárová, Z., Hudec, I., Kof, M., Feranc, J., Some aspects of reinforcing activity of fillers in rubber compounds, XI. International rubber symposium, Zlín, ČR, 11-12. September, p. 1-9, 2007 ISBN -978-80-7318-594-7
- [17] Feranc, J., Kramárová, Z., Chodák, I., Hudec, I., Šúri, P., Karvaš, A., Bugaj, P., Alexy, P.: Application of starch in combination with carbon black in SBR blends, 11th International seminar on elastomers, Freiburg, Germany, 23-27. September 2007, p. 141
- [18] Alexy, P., Bugaj, P., Vašková, I., Naháľková, A., Radosch, H.J., Chodák, I.: Morphology and mechanical properties of biodegradable polymer blends, 11. Tagung problem seminar und bruchverhalten von kunststoffen, Merseburg, Germany, 20-22. Jun 2007, p.312-315
- [19] Kopčillová, M., Julinová, M., Alexy, P., Hoffmann, J., Naháľková, A.: Biodegradation of starch-based packaging materials in aqueous aerobic environment, 34. International conference of Slovak Society of chemical engineering, Tatranské Matliare, Slovakia, 21 – 25 May 2007, Proceedings p. 247-1 – 247-9, ISBN 978-80-227-2640-5
- [20] Kopčillová, M., Julinová, M., Hoffmann J., Alexy, P.: Biologická rozložiteľnosť polymerných smesí PVAL/Gellan, 54. Konferencie chemického a procesného inžinierstva, Srní, Česká republika, 15.-18. október 2007, 1-8, ISBN 80-86059-47-2
- [21] Bakoš D.: EDPs Development in CEE Countries, Proceedings Int. Conference on Green Materials and Green Olympics, pp.96-100, October 27-28, 2007, Beijing, China
- [22] Kalinovská, L., Bubeníková, S., Bakoš, D.: Release kinetics studies of ofloxacin from chitosan-based microspheres, FBPS 2007, Gent, Belgicko, 24.-27. jún 2007, P01
- [23] Bakoš, D., Vodná, L., Bubeníková, S.: Natural polymers complexes in tissue engineering applications, Proc. FBPS 2007, Gent, Belgicko, 24.-27. jún 2007, Abstract, p. 127
- [24] Kalinovská, L., Bubeníková, S., Bakoš, D.: Biological studies of ofloxacin-releasing biodegradable chitosan-based microspheres, BYPoS 2007-1st Bratislava Young Polymer Scientists workshop, Smolenice, 20.-23. august 2007, SR
- [25] Úlehlová, J., Kalinovská, L., Danišovič, L., Kopáni, M., Bakoš, D.: Chitosan-based biodegradable membrane, BYPoS 2007-1st Bratislava Young Polymer Scientists workshop, Smolenice, Slovenská republika, 20.-23. august 2007, SR

## Patent

- [1] Alexy, P., Hudec, I., Bakoš, D., Kršiak, M., Chodák, I., Sedláková, E., Sedlá, M., Janyška, P., Šuriová, V.: Method of production of fibers from polyvinylalcohol and/or partially deacetylated polyvinylacetate, SK 285925, 2007

## PhD thesis

- [1] Kalinovská Lucia: Development of biodegradable capsules for controlled releasing of biological active substances, FCHPT STU Bratislava, 2007. (Supervisor: Prof. Ing. Dušan Bakoš, DrSc.)

## DEPARTMENT OF FIBRES AND TEXTILE CHEMISTRY

### Head of Department:

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## I. STAFF

### Full Professors:

Anton Marcinčin, PhD.,

### Associate Professors:

Michal Krištofič, PhD., Anna Murárová, PhD., Anna Ujhelyiová, PhD.,

### Research Fellows:

Eva Bolhová, Ondrej Dolgoš, Marcela Hricová, Jaroslav Legěň, PhD., Konštantín Marcinčin, PhD., Jozef Ryba since 1.10.2007

### PhD Students:

Mária Duliková (since 1.10.2004), Alena Hoferiková (since 1.10.2006), Silvia Podobeková (since 1.10.2006), Jozef Ryba (since 1.10.2004 till 30.09.2007), Zuzana Strecká (since 1.10.2005), Iveta Vassová (since 1.10.2005)

### Technical staff:

Agnesa Chlebáková, Albína Pokorná,

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Macromolecular Chemistry

Laboratory of Polymer Fibre and Fibrous Material Structure (DSC, TMA, Surface Properties)

Laboratory of Fibre Technology

Laboratory of Textile Chemistry, Bleaching, Dyeing and Finishing (Ahiba, Pretema)

Laboratory of Fibre and Textile Testing

Laboratory for Fibre Spinning, Drawing and Texturing, extruders 16 and 30 mm

### B. Research laboratories:

Laboratory for Thermal and Electrical Properties of Fibres and Textiles (DTA, DSC 7, TGA 7 - Perkin Elmer, Derivatograph Q 1500 D, integral electromer Polystat PS-1, Alambeta)

Laboratory for Thermomechanical Properties (TMA-50 M and TA)

Laboratory for Mechanical Properties (Instron, model 3334, dynamic viscoelastomer Rheovibron DDV-II-C)

Laboratory of Rheological Properties (Dynamic viscoelastomer model Rheo200, Rheometer Physica MCR 101, capillary rheometer, extrusiomer GOTTFERT 20 mm)

Laboratory for Structural Properties (Microscope Olympus model BHT, SALS),

Laboratory for Exhaust Dyeing Process and its Evaluation (Ahiba, Pretema, Spectrophotometer LIBRA S12, See System – Surface Energy Evaluation)

Laboratory for Spinning of Fibres (extruders 16 and 30 mm resp.)

Laboratory for fibrous materials based on biopolymers

## III. TEACHING

### A. Undergraduate Study: Chemical Technology

1. semester (Bc)	Principles of Textile Technology	2/0/0	Ujhelyiová
3. semester (Bc)	Physiology and Comfort of Clothing	2/0/0	Murárová
5. semester (Bc)	Textile Materials	2/1/0	Ujhelyiová
1. semester (MSc)	Physics of Polymers and Paper	2/0/2	Chodák
	Fibre Science and Technology	2/0/2	Marcinčin
	Laboratory of Chemistry and Technology of Fibres	0/0/8	Marcinčin

<b>Optional</b>	Special and Modified Fibres	0/0/2	Marcinčin
	Structure and Properties of Fibres	1/0/1	Krištofič
	Modelling and Simulation of Processes in Polymers	1/0/1	Marcinčin
<b>2. semester (MSc)</b>	Colorants and Textile Auxiliaries	2/0/0	Murárová
	Physiology and Comfort of Clothing	0/2/0	Murárová
	Special Chemical Modification of Textiles	0/2/0	Ujhelyiová
	Technical Textiles	2/0/0	Krištofič
	Principles of Textile Engineering	2/0/0	Ujhelyiová
	Laboratory of Textile Engineering	0/0/8	Marcinčin
<b>3. semester (MSc)</b>	Textile Chemistry and Technology	2/2/0	Ujhelyiová
	Technology of Polymeric Films	2/0/0	Marcinčin
	Fibre and Textile Testing	2/0/0	Murárová,
	Laboratory of Textile Chemistry and Technology	0/0/10	Ujhelyiová
<b>4. semester (MSc)</b>	Diploma work	0/0/27	Marcinčin

#### IV. CURRENT RESEARCH PROJECTS

##### **A. Project of APVT Grant Agency APVT 20-011-404 (Anton Marcinčin), Composite Fibres and Textiles**

The aim of this project is the preparation of new types of fibres based on polymer nanocomposite and to the preparation of textiles with new multifunctional properties mainly barrier against UV light, thermoregulative, further with electric conductivity and with some aspects of intelligent materials (sensors). New properties of textiles will be the consequence of nano modification of polymers and fibres with additives as well as new construction aspects of textiles. The project is oriented to the basic material research of fibres and fabrics.

Project duration: from 01.05.2005 to 31.05.2008

##### **B. International EU Project 6 FP 505 567-1(Anton Marcinčin), Biotechnological Process for Manufacturing Cellulosic Product with added Value**

Project is focused to the basic investigation of new biochemical ways how to dissolve the cellulose and change its original form. Method is based on the safe, biodegradable enzymes used instead of toxic dangerous CS<sub>2</sub> with the aim to create products from regenerated cellulose. Biocelsol technologies are break through in comparison with existing processes for preparation of regenerated cellulose and give harmless technologies for modification of cellulose with selected enzymes. Enzymatically modified cellulose is better soluble in water-alkali solutions and its processing to solutions is more simple. Scientific goals of the project:

- understand enzymatic processes in cellulose and their influence on the structure and processability of the cellulose,
- investigate new products with involved functional properties based on enzymatically modified cellulose,
- ensure exceptional decrease of environmental and health influence in comparison with viscose process,
- prove new, acceptable procedures which reduce production cost in cellulose industry.

Project duration: from 2004 to 2007

##### **C. International EU Project 6 FP 6 516972 (Anton Marcinčin), Nanohybrid – designed nanostructured hybrid polymers: polymerisation catalysis and Tecton assembly**

The project is focussed on to: 1. Creation of new knowledge related to macromolecular architecture designs via transition metal catalysis which will be up access to novel random and block copolymers and polymer product compositions. 2. Understanding the phenomena of nanocompomers and nanocomposites' formation either during in-situ polymerisation or during melt processing. 3. Investigation of fundamental characteristics of the organic-inorganic interphase region by multi-scale analysis.

4 Application-oriented property enhancement, thanks to nanostructured hybrid polyolefins.

Project duration: from 01.03.2005 to 28.02.2008



#### **D. VEGA project 1/2475/05 (Anton Marcinčin), Composite fibres based on polymer blends with fibrillar phase structure**

Project is focussed to acquirement of experience from the formation of phase structure of new fibres on the basis of binary and ternary polymer blends with hierarchical morphology of micro- and nano-structure elements. Phase structure of composite fibres is polyfibrillar. Dispersed polymer component in the matrix of fibre is in the shape of highly deformed particles. The aim of the project is to acquire a knowledge about principles of formation of composite polyfibrillar fibre structure, about interphase interactions of functional groups, about influence of rheological properties of components and the control of threephase structure formation and selected fibre properties mainly mechanical, electric, barrier and sorptive ones.

Project duration: from 01.01.2005 to 31.12.2007

#### **E. VEGA project 1/2451/05 (Anna Murárová), Physical activation of polymer fibre surfaces**

Project is focussed to the evaluation of the influence of laser, microwave and low-temperature plasma energy and other media to the activity of the fibre surfaces. The change of the morphological and supermolecular structure on the surface polymer level of fibres causes the change of properties of this surface.

Project duration: from 01.01.2005 to 31.12.2007

#### **F. VEGA project 1/4456/07 (Anna Ujhelyiová), Blend nanocomposite fibres based on synthetic polymers**

Project is focussed to the preparation of the new types of blend composite fibres based on the synthetic polymers (polypropylene, polyamide 6, polyethylene terephthalate) with multifunctional properties like electric conductivity, sorptive and sensory properties. New properties of the blend composite fibres will be the consequence of the simultaneous modification of synthetic polymers by polymer (e.g. PVA, electric conductive – PANI) and solid inorganic and organic additives.

The aim of this project is the study of the influence of the prepared conditions of blend composite fibres (modified by additives) to the formation of morphological and supermolecular structure and to the followed properties especially electric conductivity, sorptive (dyeability) and sensory properties.

Project duration: from 01.01.2007 to 31.12.2009

#### **G. APVV-0226-06 project (Anna Ujhelyiová), High tenacity and thermobonding metallocene polyolefine fibres**

Project is focussed to the preparation of fibres from metallocene polyolefins – polypropylene and polyethylene with new end-use properties for textile and technical application. High tenacity fibres and thermobonding fibres for textile technology will be the result of this project. New properties of fibres will be reached by using polyolefines with control molecular and supermolecular structure which are prepared with metallocene catalysts. Further in the project at new experience and generalized relationships among conditions of preparation, structure, mechanical-physical and thermal properties of metallocene polyolefins fibres will be obtained.

Project duration: from 01.02.2007 to 31.12.2009

### **V. CURRENT EDUCATION PROJECTS**

### **VI. COOPERATION**

#### **A. Cooperation in Slovakia**

<b>Institution</b>	<b>Type of cooperation</b>	<b>Responsible person</b>	<b>Duration</b>
Fibrochem, a.s., Svit	Technical and material assistance	Marcinčin	2006
VÚCHV Svit, a.s.	Common APVT project	Marcinčin	2006
NEXIS FIBRES, a.s. Humenné	Technical and material assistance	Marcinčin	2006
VÚTCH Chemitex Žilina, spol. s.r.o.	Common APVT project	Marcinčin	2006
TnUAD FPT Púchov	Technical and personal assistance	Marcinčin	2006
Polymer Institute SAV Bratislava	Technical and personal assistance	Marcinčin	2006

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
AUTEX, Gent, Belgium	Member of AUTEX, organization of conferences	Prof. P. Kiekens	since 2002
University of Zagreb	Cooperation in research, organization of conferences	Prof. A.M. Grančarič	since 2004
TU Liberec	Cooperation in research and study program	Prof. J.Militký	since 2005
Kiev National University of Technologies and Design	Surface activity of textiles	Assoc. prof. V. Vlasenko	since 2004

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Marcinčin Anton	Slovak Union for Industrial Chemistry	member	2001
Ujhelyiová Anna	Slovak Union for Industrial Chemistry, Slovak Chemical Society	member	2001, 1999
Murárová Anna	Slovak Union for Industrial Chemistry	member	2001
Krištofič Michal	Slovak Union for Industrial Chemistry, Slovak Chemical Society	member	2001, 1999
Hricová Marcela	Slovak Union for Industrial Chemistry	member	2001
Legéň Jaroslav	Slovak Chemical Society	member	1999

## D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Marcinčin Anton	Assoc. of Universities for Textiles, AUTEX, B Scientific Council, TU Liberec, CZ	member	since 2001

## E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
S. Bredeau	UMH,	Belgium	October 2007, ( 3 days)
S. Coiai	ICCOM, Florence	Italy	October 2007, (3 days)
S. Augier	ICCOM, Florence	Italy	October 2007, (3 days)
A.C. de Giacomoni	ALMA	France	October 2007, ( 3 days)
F.Lagouanelle	ALMA	France	October 2007, ( 3 days)
A.Jupin	ALCAN	France	October 2007, ( 3 days)
P. Tiquet	CEA	France	October 2007, ( 3 days)
S. Bredeau	UMH	France	October 2007, ( 3 days)
P. Dubois	UMH	France	October 2007, ( 3 days)
T. Halbach	FMF	Germany	October 2007, ( 3 days)
R. Streller	FMF	Germany	October 2007, ( 3 days)
I. Tritto	ISMMAc	Italy	October 2007, ( 3 days)
L. Boggioni	ISMMAc	Italy	October 2007, ( 3 days)
A. Ravasio	ISMMAc	Italy	October 2007, ( 3 days)
A. Jupin	ALCAN	France	October 2007, ( 3 days)
V. Lambertini	CRF	Italy	October 2007, ( 3 days)
L. Federsoni	CEA	France	October 2007, ( 3 days)
D. Bonduel	Nanocyl	France	October 2007, ( 3 days)
S. Bocchini	CDCMO	Italy	October 2007, ( 3 days)

## F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Ujhelyiová, A.	Defence of HEUREKA project	Czech Rep.	February 2007, (1 days)
Marcinčin, A.	Final meeting of BIOCELSOL project	Finland	February 2007, (5 days)
Marcinčin, A.	Evaluation 24M of NANOHYBRID project	Italy	March 2007, (4 days)
Ujhelyiová, A.	Evaluation 24M of NANOHYBRID project	Italy	March 2007,(4 days)
Marcinčin, A.	SPOLSIN, Česká Třebová	Czech Rep.	March 2007, (2 days)
Vassová I.	Conference of Chem. Engineering '07, Veszprem	Hungary	April 2007, (3 days)
Bolhová, E.	TEXSCI 2007 Conference, Liberec	Czech Rep.	June 2007,(3 days)
Dulíková, M.	TEXSCI 2007 Conference, Liberec	Czech Rep.	June 2007 ,(4 days)
Marcincin, A.	TEXSCI 2007 Conference, Liberec	Czech Rep.	June 2007, (4 days)
Vassová, I.	TEXSCI 2007 Conference, Liberec	Czech Rep.	June 2007, (4 days)
Ryba, J.	TEXSCI 2007 Conference, Liberec	Czech Rep.	June 200,7 (4 days)
Ujhelyiová, A.	TEXSCI 2007 Conference, Liberec	Czech Rep.	June 2007, (4 days)
Podobeková, S	TEXSCI 2007 Conference, Liberec	Czech Rep.	June 2007, (4 days)
Marcincin, A.	World Textile Conference AUTEX, Portorose	Slovenia	July 2007, (6 days)
Marcincin, A.	5 th Central European Conference, Krakow	Poland	September 2007, (5 days)
Ujhelyiová, A.	5 th Central European Conference, Krakow	Poland	September 2007, (5 days)
Murárová, A.	5 th Central European Conference, Krakow	Poland	September 2007, (5 days)
Strečká, Z.	5 th Central European Conference, Krakow	Poland	September 2007, (5 days)
Marcincin, A.	46 th Dornbirn Man-Made Fibers Conference	Austria	September 2007, (6 days)
Ujhelyiová, A.	46 th Dornbirn Man-Made Fibers Conference	Austria	September 2007, (6 days)
Murárová, A.	46 th Dornbirn Man-Made Fibers Conference	Austria	September 2007, (4 days)
Murárová, A.	Stage, University KNUTD Kiev	Ukraine	October 2007, (31 days)
Marcincin, A.	Int. Fair KUNTSTOFFE 2007, Dusseldorf	Germany	October 2007, (4 days)
Marcincin, A.	ITHC 2007 Conference, Casablanca	Morocco	November 2007, (7 days)
Marcincin, A.	Textile Conference Aachen	Germany	Nov.-Dec.2007, (4 days)
Marcinčin, A.	Int. Fair ITMA, Munich	Germany	September 2007, (1day)
Ujhelyiová, A.	Int. Fair ITMA, Munich	Germany	September 2007, (1 day)

# DEPARTMENT OF GRAPHIC ARTS TECHNOLOGY AND APPLIED PHOTOCHEMISTRY

**Head of Department:**  
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## I. STAFF

### Associate Professors:

Michal Čeppan, PhD; Milan Mikula, PhD; Ján Panák, PhD

### Assistant Professors :

Viera Jančovičová, PhD

### Research Fellows:

Vladimír Dvonka; Bohuslava Havlínová, PhD; Zuzana Jakubíková (until 30. 9. 2007); Milena Reháková, PhD

### PhD Students:

Matúš Lendacký (until 30. 9. 2007); Lenka Marhefková (since 1. 10. 2007); Iveta Mrlláková (until 30. 8. 2007); Daniela Pavlisová (since 1. 10. 2007); Miroslava Petrovičová (since 1. 10. 2007); Zuzana Pobudová (since 1. 10. 2007); Alexandra Valaseková

### Technical staff:

Mária Bardúnová; Stanislava Kováčová

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Printing Technology  
Laboratory of Photochemistry and Photography  
Laboratory of Optical Spectroscopy and Photometry  
Laboratory of Thin Films and Plasma Technology  
Laboratory of Rheology

### B. Research laboratories:

Laboratory of Absorption Spectroscopy and Colorimetry

## III. TEACHING

### A. Undergraduate Study: Graphic Arts Technology and Photochemistry

<b>6. semester (Bc)</b>	Paper and Printing, Graphic Arts	2/2/0	Panák, Šutý
	Term Project	0/4/0	Mikula and other members of the academic staff
<b>1. semester (MSc)</b>	Colloids Systems and Interfaces	2/1/0	Bakoš, Reháková, Mikula
	Polymer and Paper Physics	0/2/0	Jančovičová
	Photochemistry and Photography I.	2/1/0	Čeppan, Jančovičová, Reháková
	Surface and Thin Film Technology	2/0/0	Mikula
	Advanced Laboratory Course I.	0/0/9	Havlínová, Jančovičová, Mikula
	Typography and Text Processing	0/2/0	Dvonka
<b>2. semester (MSc)</b>	Photochemistry and Photography II.	2/0/0	Čeppan
	Printing Technology I.	2/0/0	Panák
	Advanced laboratory Course II.	0/0/7	Čeppan, Dvonka, Havlínová, Jančovičová
	Planning for Printing Production	0/2/0	Panák, Dvonka
	Text and Image Processing	1/1/0	Čeppan, Dvonka
<b>3. semester (MSc)</b>	Printing Technology II.	2/0/0	Panák
	Repronics	1/3/0	Mikula, Dvonka
	Advanced Laboratory Course III:	0/0/10	Panák, Dvonka
<b>4. semester (MSc)</b>	Diploma Thesis	0/0/27	members of the academic staff

## B. Undergraduate Study: Technology of Polymer Materials

<b>1. semester (Bc)</b>	Surface and Thin Film Technology	2/0/0	Mikula
	Project I.	0/1/0	Bakoš and other members of the academic staff
<b>2. semester ( Bc)</b>	Project II.	0/1/0	Bakoš and other members of the academic staff
<b>3. semester (Bc)</b>	Text and Image Processing	2/0/0	Čeppan, Dvonka
<b>4. semester (Bc)</b>	Project III.	0/2/0	Bakoš and other members of the academic staff
<b>5. semester (Bc)</b>	Basis of Graphic Arts Technology	2/1/0	Panák
	Text and Image Processing	2/0/0	Čeppan, Dvonka
	Project IV.	0/3/0	Bakoš and other members of the academic staff

## IV. CURRENT RESEARCH PROJECTS

### **VEGA Project No 1/2454/05 Atmospheric Plasma Treatment and Modification of the Surface Properties of Paper and Cellulose Fibre Based Materials (Milan Mikula)**

Preparation and modification of thin layer properties on a paper or on flat cellulose fibre based materials, focusing in the functionality, quality, strengthening, stabilization and protection. Modification/treatment of paper by a new type of atmospheric barrier discharge directly in active zone of reactive gas plasma, or by consecutive grafting and/or UV curing. Hydrophobization of paper using UV cured polymers based on siloxanes, acrylates and water-based polymers and their unsaturated derivatives. The study of the final surface properties of modified paper, final strength, layer adhesion, optical and permeation barrier properties. Cleaning and deacidification of naturally aged paper from archives (saving of cultural heritage) in alkaline plasma (nitrogen, ammonia) and its strengthening and stabilization by layers prepared

Project duration: from 01. 01.2005 to 31. 12. 2007

### **VEGA Project No 1/2455/05 Study of properties of inks, dyes and printing inks in the structures of graphic images (Michal Čeppan)**

Development of methods of molecular spectroscopy (IR, UV-VIS) aimed to the study of documents with graphic records. Chemometric procedures will be utilized to extract useful chemical information from complex sets of spectra (factor analysis, multivariate statistical analysis). These methods will be used in study of processes during the ageing of historical documents containing iron-gall inks. Study of processes of photochemical decay of inks containing aryl methane dyes as well as the relation between conservations procedures and properties of ink records. Study of relation between properties of paper, transfer characteristics and quality of printed image.

Project duration: from 01. 01.2005 to 31. 12. 2007

### **Project of ME SR No 661/2003 Preservation, Stabilization and Conservation of Traditional Information Supports in the Slovak Republic (Dušan Bakoš, Milena Reháková)**

This project covers programme of saving, stabilization and conservation of traditional holders of information (books, archival documents etc.). Big portion of cultural heritage stored in historical books and archival documents is endangered with destructive impacts of abiotic and biotic factors. This can cause irretrievable loss of cultural heritage of Slovak Republic. Solving of this problem is divided into two time phases. First includes years 2003 - 2005 and its subject covered basic research. The second period, years 2006-2009, includes applied research and development.

Project duration: from 01.10. 2003 to 31. 12. 2009

### **6th Framework Programme of European Commission: Innovation and Sustainable Development in the Fibre Based Packaging Value Chain. (SUSTAINPACK) (Dušan Bakoš, Milan Mikula).**

The participation is based on the study of the deposition kinetics of polymer emulsion particles to the pulp fibers, rate of deposition, degree of cover, retention, retention agents – polyelectrolytes and characterization of materials. Particularly, it includes photo- and plasmochemical activation, modification and/or covering of cellulose fibres in suspension or in a paper-like material, and characterization of materials and activation/deposition kinetics by FTIR

spectroscopy, UV Vis. spectral and colorimetry analysis, wetting, adsorption, mechanical and barrier properties measurements.

Project duration: from 01. 06. 2004 to 31. 5. 2008

### **COST ACTION D42 Chemical Interaction between Indoor Environment And Cultural Artefacts (Michal Čeppan)**

The main objective of the Action is to explore chemical interactions between cultural artefacts and typical indoor environmental conditions through field studies and laboratory experiments and to translate the results into preventive conservation. The Action focuses on the chemical impact of pollutants on materials, thus also considering physical and environmental aspects, materials technology, chemical analytics, emission and standardisation.

Project duration: from 1.9.2006 to 31. 8. 2010

## **VI. COOPERATION**

### **A. Cooperation in Slovakia**

<b>Institution</b>	<b>Type of cooperation</b>	<b>Responsible person</b>	<b>Duration</b>
Slovak National Archives	Study of preservation of historical documents	Hanus Jozef, head of the Department of archival preservation, Drotárska cesta 42, 817 01 Bratislava	01. 01. 2000 -
Institute of Physics SAS	Amorphous a-Si:H structures for solar cells Study of barrier layers	Pinčík Emil, Dúbravská cesta 9, 845 11 Bratislava	01. 01. 2001 -
Faculty of Mathematics, Physics and Informatics, CU, Bratislava	Polymer surface treatment by atmospheric discharges	Černák Miroslav, Mlynská dolina, 842 48 Bratislava	01. 09. 2000 -
Slovak National Library, Martin	Study of preservation of historical documents	Maková Alena, Námestie J. C. Hronského 1, 036 01 Martin	01. 01. 2004 -
Institute of Forensic Science, Slovak Police Corps, Bratislava	Properties and diagnostics of printed documents	Adriana Jabconová, Sklabinská 1, 812 37 Bratislava	01. 01.2002 -

### **B. International Cooperation**

<b>Institution</b>	<b>Type of cooperation</b>	<b>Responsible person</b>	<b>Duration</b>
Fraunhofer Institute Process Engineering and Packaging (IVV), Freising, Germany	Research of barrier layers on flexible foils	Noller Klaus, dr., Fraunhofer Inst. IVV, 853 54 Freising	01. 09. 2002 -
Fraunhofer Institute for Silicate Research, Würzburg, Germany	Properties of Ormocer lacquer layers	Amberg-Schwab Sabine, dr., Fraunhofer Inst. ISC, 970 82 Würzburg	01. 09. 2002 -
Faculty of Chemistry, Technical University Brno, Czech Republic	Photochemical properties of light sensitive layers	Michal Veselý, Purkyňova 118, 612 00 Brno	01. 09. 2001 -
State Central Archives in Prague, Czech Republic	Longlasting measurements of nonaged and aged papers	Ďurovič Michal, head of department, Archivní 4, 149 01 Praha 4 - Chodovec	01. 01. 2001 -
Faculty of Natural Sciences and Engineering, University of Ljubljana, Slovenia	Analysis of coatings of paper for ink jet printing	Hladnik Ales, Snezniska 5 1000 Ljubljana	01. 10. 2006 -
Netherlands Institute for Cultural Heritage	Analysis of spectra of historical documents	Han Neevel, 1070 KA Amsterdam, Netherlands	01. 09. 2004 -

Institut Royal du Patrimoine Artistique	Analysis of pigments in paint layer of historical materials	Sanyova-Debondnie Jana, Cellule technique picturale, Park du Cinquantenaire 1, B-1000 Bruxelles	01. 09. 2004 -
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### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Čeppan Michal	Slovak Union for Industrial Chemistry	member	1980 -
Dvonka Vladimír	Slovak Union for Industrial Chemistry	member	1996 -
Havlíňová Bohuslava	Slovak Union for Industrial Chemistry	member	1980 -
Jančovičová Viera	Slovak Union for Industrial Chemistry	member	1999 -
Míkula Milan	Slovak Union for Industrial Chemistry	member	1980 -
Panáč Ján	Slovak Union for Industrial Chemistry	member	1978 -
Reháková Milena	Slovak Union for Industrial Chemistry	member	2001 -

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Čeppan Michal	International Society of Imaging Science and Technology, Springfield, USA	member	1985 -
Michal Čeppan	Graphic Arts Technical Foundation, Sewickley, USA	member	1988 -

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Kaplanová, M.	University of Pardubice, Pardubice	Czech Republic	June 2007 (3 days)
Đurovič, M.	National Archives in Prague	Czech Republic	June 2007 (2 days)
Paulusová, H.	National Archives in Prague	Czech Republic	June 2007 (2 days)
Lapčák, L.	Tomas Bata University, Zlín	Czech Republic	June 2007 (3 days)
Vesely, M.	Brno University of Technology, Brno	Czech Republic	June 2007 (3 days)

### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Belányiová E., Marušicová B., Petrovičová M.	National Archives in Prague	Czech Republic	February 2007 (6 days)
Dvonka V., Jančovičová V., Lendacký M., Panák J.	Seminar Print Media, Heidelberg,	Germany	March 2007 (4 day)
Belányiová E., Petrovičová M.	National Archives in Prague	Czech Republic	April 2007 (6 day)
Havlíňová B.	National Archives in Prague	Czech Republic	May 2007 (4 days)
Čeppan, M.	Tomas Bata University, Zlín	Czech Republic	April 2007 (1 day)
Čeppan M., Havlíňová B., Jančovičová V., Míkula M., Reháková M.	Brno University of Technology, Brno	Czech Republic	May 2007 (1day)
Dvonka V., Panák, J.	Brno University of Technology, Brno	Czech Republic	May 2007 (2 days)

Čeppan M., Reháková M.	Center for Sustainable Values "Lychnidos"	Macedonia	May 2007 (5 days)
Čeppan	University of Pardubice, Pardubice	Czech Republic	June 2007 (2 days)
Mikula M.	VEECO, Mannheim	Germany	June 2007 (4 days)
Čeppan, M.	Brno University of Technology, Brno	Czech Republic	June 2007 (2 days)
Panáč J.	University of Pardubice, Pardubice	Czech Republic	June 2007 (4 days)
Čeppan, M.	Brno University of Technology, Brno	Czech Republic	September 2007 (2 days)
Čeppan M., Dvonka V., Mikula M., Panáč J.	University of Pardubice, Pardubice	Czech Republic	September 2007 (3 days)
Čeppan M.	National Research Council, Institute of Atmospheric Sciences and Climate, Padova	Italia	Oktober 2007 (5 days)
Dvonka V.	Brno University of Technology, Brno	Czech Republic	Oktober 2007 (2 days)
Mikula M., Čeppan M.	University of Pardubice, Pardubice	Czech Republic	November 2007 (1 day)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Ciglanská, M.	The Influence of Oxygen on the Complex Formation between Iron and Gallic Acid	Jančovičová, V.
Gál, L.	Evaluation of Color Differences in Graphic Arts Technologies	Čeppan, M.
Chrenová, M.	Proofing in Graphic Art Industry and Packing Industry	Panáč, J.
Kmetřová, J.	Plasmochemical Hydrofobization of Paper and its Evaluation	Mikula, M.
Šandrej, M.	Image Analysis Methods Comparison for Evaluation of Graphic Representation	Dvonka, V.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Belányiová, E.	Study of Stability of Arylmethane Inks	Havlínová, B.
Buzinkay, A.	Identification and Study of Properties of Writing and Recording Means in Historical Documents	Čeppan, M.
Macek, M.	Image Analysis Methods for Evaluation of Graphic Images	Dvonka, V.
Malčíková, M.	Study of Influence of Iron-gall Inks Composition on Properties of Historical Documents	Reháková, M.
Petrovičová, M.	Influence of MMMK Neutralization on Stability of Historical Documents	Havlínová, B.
Rakovanová, M.	Study of Interactions of Components of Historical Documents	Jančovičová, V.
Stasová, M.	Barrier and Surface Properties of Polymer Layers	Jančovičová, V.
Vašíček, M.	Hydrophobization of Paper Using Atmospheric Plasma Assisted Deposition of Organosilicon Compounds	Mikula, M.
Vereščáková, I.	Study of Methods for Print Quality and Printability Evaluation	Panáč, J.

## VIII. PUBLICATIONS

### Article in journal

- [1] Búc, D., Bello, I., Čaplovičová, M., Mikula, M., Kováč, J., Hotový, I., Chong, Y.M., Siu, G.G.: Analysis of Magnetron Sputtered Boron Oxide Films. *Thin Solid Films* 515, pp. 8723-8727, 2007.
- [2] Csefalvayová, L., Havlínová, B., Čeppan, M., Jakubíková, Z.: The Influence of Iron Gall Ink on Paper Ageing. *Restaurator* 28, pp. 129-139, 2007.



- [3] Gilan, A., Mikula, M.: Lesk papierov a fólií. Polygrafie revue 9 (4), pp. 48-49, 2007.
- [4] Havlínová, B., Mináriková, J., Hanus, J., Jančovičová, V., Szabóová, Z.: The Conservation of Historical Documents Carrying Iron Gall Ink by Antioxidants. Restaurator 28, pp. 112-128, 2007.
- [5] Hojerová, J., Šovčíková, D., Mikula, M.: In Vitro Evaluation of the UV Filters Photostability. In: Journal of the Polish Society of Cosmetic Chemists. 9 (4), pp. 11-16, 2007.
- [6] Jančovičová, V., Kindernay, J., Jakubíková, Z., Mrláková, I.: Influence of Photoinitiator and Curing Conditions on Polymerization Kinetics and Gloss of UV-Cured Coatings. Chemical Papers 61 (5), pp. 383-390, 2007.
- [7] Jančovičová, V., Čeppan, M., Havlínová, B., Reháková, M., Jakubíková, Z.: Interactions in Iron Gall Inks. Chemical papers 61 (5), pp. 391-397, 2007.
- [8] Valaseková, A., Šutý, Š., Mikula, M., Gigac, J.: Vzťah medzi porozitou a leskom natieraných a nenatieraných papierov. Papír a celulóza 62 (6), pp. 195-197, 2007.

### Article in conference proceedings

- [1] Csefalvayová, L., Brezová, V., Havlínová, B.: Application of EPR Spin Trapping Technique in the Investigation of Radical Intermediates Involved in Paper Degradation. In: Safeguarded Cultural Heritage. Proceedings of the 7<sup>th</sup> European Conference „SAUVEUR“, Praha, Czech Republic, pp.791 – 793, 2007.
- [2] Čeppan, M., Gál, L., Candráková, S.: Kolorimetrické hodnotenie farebných rozdielov. Seminar in Graphic Arts. In: Sborník přednášek VIII. Polygrafického semináře, Pardubice, Czech Republic, pp. 57-61, 2007.
- [3] Čeppan, M., Reháková, M., Hanus, J.: Využitie optovláknovej reflexnej spektroskopie VIS- NIR na identifikáciu železozalových atramentov. In: Modifikácie celulózových materiálov, Wood Pulp and Paper WPP07, Čilistov, SR, .pp. 29-30, 2007.
- [4] Dvonka, V., Panák, J., Čeppan, M., Lendacký, M.: Obrazová analýza rastrových štruktúr. Seminar in Graphic Arts. In: Sborník přednášek VIII. Polygrafického semináře, Pardubice, Czech Republic, pp. 62-69, 2007.
- [5] Hojerová, J., Medovčíková, A., Mikula, M., Boreková, M.: Photostability, UVA Protection and Critical Wavelength of the Sunscreens. In: Proceedings of the International Conference of Cosmetology, České Budejovice, Czech Republic, pp. 36-40, 2007.
- [6] Jakubíková, Z., Mikula, M.: Grafting of HMDSO and HMDSZ onto PP in Atmospheric Dielectric Barrier Discharge Nitrogen Plasma. In: 16th Symposium of Application of Plasma Processes (SAPP XVI), Podbanske, SR, pp. 181-182, 2007.
- [7] Jakucewicz, S., Panák, J.: Štúdium vhodnosti plne ekologických papierov pre tlač kníh. Seminar in Graphic Arts. In: Sborník přednášek VIII. Polygrafického semináře, Pardubice, Czech Republic, pp. 34-41, 2007.
- [8] Jančovičová, V. ., Mrláková, I.: Photochemical Curing of Aliphatic Urethane Acrylate coatings. In: Chemické listy. 101, PMA Bratislava, SR, p. 58, 2007.
- [9] Maková, A., Havlínová, B., Csefalvayová, L.: Effect of Stabilization Procedures on Wood Containing Paper. In: Safeguarded Cultural Heritage. Proceedings of the 7<sup>th</sup> European Conference „SAUVEUR“, Praha, Czech Republic, pp.783 – 785, 2007.
- [10] Malčíková, M., Reháková, M.: Štúdium vplyvu zloženia atramentov na vlastnosti historických dokumentov. In: Modifikácie celulózových materiálov, Wood Pulp and Paper WPP07, Čilistov, SR, .pp. 31-32, 2007.
- [11] Mikula, M., Vašíček, M., Šutý, Š.: Hydrofobizácia papiera pomocou pár organokremičitých zlúčenín za asistencie N<sub>2</sub> plazmy pri atmosferickom tlaku. In: Modifikácie celulózových materiálov, Wood Pulp and Paper WPP07, Čilistov, SR, .pp. 11-12, 2007.
- [12] Mikula, M., Valaseková, A., Vašíček, M., Vaško, K.: Mechanical Strengthening of Plastic Foils by Thin Glass – Like Layers. In: Chemické listy. 101, PMA Bratislava, SR, pp. 64-65, 2007.
- [13] Mikula, M., Vašíček, M., Valaseková, A., Šutý, Š.: Hydrophobization of Paper by Organosilicon Compounds in N<sub>2</sub> Plasma at Atmospheric Pressure. Seminar in Graphic Arts. In: Sborník přednášek VIII. Polygrafického semináře, Pardubice, Czech Republic, pp. 188-192, 2007.
- [14] Panák, J., Dvonka, V., Jakucewicz, S., GIGAC, J.: Štúdium potlačiteľnosti a kvality tlače na ofsetových papieroch. Seminar in Graphic Arts. In: Sborník přednášek VIII. Polygrafického semináře, Pardubice, Czech Republic, pp. 77-86, 2007.
- [15] Petrovičová, M., Havlínová, B.: Vplyv neutralizácie MMMK na stabilitu historických dokumentov. In: Modifikácie celulózových materiálov, Wood Pulp and Paper WPP07, Čilistov, SR, .p. 13, 2007.
- [16] Trnovec, B., Mikula, M.: Surface Modification of Paper by Atmospheric DBD in N<sub>2</sub> with HMDSO and Chitosan to Enhance its Strength, and Protection Against Aging. In: 16th Symposium of Application of Plasma Processes (SAPP XVI), Podbanske, SR, pp. 271-272, 2007.
- [17] Vizárová, K., Reháková, M., Kirschnerová, S., Čeppan, M.: Study of Stability of Materials Suitable for Restoration of Baroque Oil Painting. In: COST strategic workshop, Ohrid, FYROM, pp. 1-2, 2007.

## DEPARTMENT OF CHEMICAL TECHNOLOGY OF WOOD, PULP AND PAPER

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## I. STAFF

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### Research Fellows:

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### PhD Students:

Soňa Fígedyová, Attila Szitás, Eva Gemzická, Soňa Kirschnerová, Erika Nováková, Michal Letko, Radoslav Mikulášik

### Technical staff:

Pavol Vančo, Zuzana Žaškovská

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Chemical Treatment of Wood  
Laboratory of Pulping and Papermaking Technology  
Laboratory of Structure and Properties of Paper  
Laboratory of Wood Chemistry

### B. Research laboratories:

Laboratory of Natural Polymers  
Laboratory of Papermaking Fibres and Additives  
Laboratory of Structure and Analysis of Wood  
Laboratory of GC-MS Analysis  
Laboratory of Thermal Analysis  
Laboratory of Physical Properties of Lignocellulosics and Biomaterials  
Laboratory of Conservation and Restoration of Printing Documents  
Laboratory of Plasma Treatment of Wood

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Pulp and Paper	2/0	Vrška, Šutý
<b>2. semester (Bc)</b>	Lignocellulosic materials	2/1	Šurina, Tiňo, Vizárová, Šutý
<b>6. semester (Bc)</b>	Semestral Project	0/4	members of department
	Paper and Printing	2/2	Šutý, Panák
<b>1. semester (MSc)</b>	Physics of Polymers and Paper	2/2	Šutý, Chodák
	Natural Polymers	2/1	Vizárová
	Chemistry and Analysis of Wood	2	Vizárová, Katuščák
	Pulping Technology	3/1	Vrška
	Laboratory I.	8	Vizárová, Tiňo, Šurina
	Environmental Management in Pulp and Paper Industry	2	Vizárová, Katuščák
<b>2. semester (MSc)</b>	Paper Machines	2/2	Fekete
	Engineering of Pulp Production	1/1	Vrška, Šutý

	Paper Technology I.	3/0	Šutý
	Chemical Treatment of Wood I.	3/0	Šurina, Katuščák
	Laboratory II.	8	Šurina, Vrška
	Practical Training Course	3 weeks	
<b>3. semester (MSc)</b>	Chemical Treatment of Wood II.	2/0	Katuščák, Šurina
	Paper Technology II.	3/0	Šutý
	Packaging Materials	2/0	Tiňo
	Papermaking aids	2/0	Vizárová
	Laboratory III.	9	Vrška, Šurina, Šutý
<b>4. semester (MSc)</b>	Thesis	30	members of department

#### IV. CURRENT RESEARCH PROJECTS

##### **Project of ME SR No 2003 č. 661/2003 Preservation, Stabilization and Conservation of Traditional Information Supports in the Slovak Republic (Svetozár Katuščák)**

This project covers program of saving, stabilization and conservation of traditional holders of information (books, archival documents etc.). Big portion of cultural heritage stored in historical books and archival documents is endangered with destructive impacts of abiotic and biotic factors. This can cause irretrievable loss of cultural heritage of Slovak Republic. Solving of this problem is divided into two time steps. First includes years 2003 - 2005 and its subject covers basic research. Except of this, second step will also include applied research and development.

Project duration: from 01.10. 2003 to 31.12. 2008

##### **APVT Project 20-033004: Study of influences of electrical plasma generated at atmospheric pressure onto surface of massive wooden materials (Svetozár Katuščák)**

Main goal of the project is to study effect of electrical plasma treatment of the wood surface using inovative nowadays generated plasma source. Application topic is to study inovative environmentally and economically advantageous use of plasma for surface treatment procedures in woodprocessing and furniture industry.

Project duration: from 01.01.2005 to 31.12.2007

##### **VEGA Project 1/3567/06: MATERIALS – physico-chemical methods of their study (Šurina Igor)**

The project is aimed at the development of methods of materials study and their use for processes exhibiting the induction period, e.g. thermooxidative processes and phase transitions. Non-stabilized and stabilized polymers and other materials belong to the main objects of the study. From the measurement of residual thermooxidative stability, the equivalency between accelerated ageing tests and natural ageing of materials is determined. The method will be applied for the life-time prediction of materials under extreme conditions, i. e. in automotive industry and nuclear power plants. Experimental results will be interpreted using theoretical models involving kinetics, thermodynamics and statistical thermodynamics of processes with the implementation of modern mathematical approach, such as the fractal theory and neural networks.

Project duration: from 01. 01. 2006 to 31. 12. 2008

#### VI. COOPERATION

##### **A. Cooperation in Slovakia**

Institution	Type of cooperation	Responsible person	Duration
MONDI BP SCP a.s. Ružomberok	Brightness Reversion of Bleached Hardwood Karft Pulp The Using of Hydrogen Peroxide in Oxygen Delignification	Jaroslav Sýkora, manager Bystrická cesta 13, 034 17 Ružomberok	2006 -2008
Faculty of Natural Science, Comenius University, Bratislava	Study of influences of electrical plasma onto wood surface	Černák Miro, Prof., Mlynská dolina, 842 15 Bratislava	01.01.2005 -
Slovak National Library, Martin	Preservation of archived books and documents	Bukovský Vladimír, manager, SNK Martin	5.5.2002-

Slovak National Archives, Bratislava	Preservation of archived books and documents, education.	Hanus Jozef, manager, SNA Bratislava	permanently
Pulp and Paper Research Institute, Bratislava	Information System, Research	Boháček Štefan, president of board, VÚPC Bratislava, Lamačská 3	01.01.2005-
Smurfit Kappa Štúrovo a.s.	Influence of AQ on SAQ pulp properties	Szabo Eugen, Babinec Ivan, Smurfit Kappa	05. - 09. 2008
Slovak National Museum	Quantification and Saving of Cultural Heritage	Lalíková, N., SNM	2006 - 2008
Slovak National Gallery	Quantification and Saving of Cultural Heritage	Homolová, A., SNG	2006 - 2008
TU Zvolen	Education	Sedliačik J., Kačík F.	permanently

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Dept. of Chem. Technology of Wood, Pulp and Paper, Technical University, Pardubice, Czech Republic	Education	Milichovský Miloslav, Prof. TU Pardubice	permanently
Library of Congress, Washington, D.C.	Research	Ch. J. Shahani, Chief of Preservation Research & Testing Division	2004-2008
French Institute of Papermaking and Graphics Industry, Grenoble, France	Education and Research	Roux, J. C., Professor, Ecole Française de Papeterie et des Industries Graphiques, Grenoble, France	permanently

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Vrška Milan	Slovak Chemical Society	member	01.01.1980 -
Vrška Milan	SNAS -Accreditation group	member	23.09.2002 -
Vrška Milan	SUTN -Technical normalization committee - TC 19 - pulp, paper, board	member	26.05.2003 -
Katuščák Svetozár	SUTN -Technical normalization committee - TC 72 - environmental management	member	permanently
Krkoška Pavel	Slovak Chemical Society	member	1979 -
Katuščák Svetozár	Wood Research, editorial board	member	permanently
Katuščák Svetozár	Chemical Papers, editorial board	member	2005 -
Šutý Štefan	Slovenská spoločnosť priemyselnej chémie	member	2002 -

## D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Katuščák Svetozár	European Panel Federation	member	20. 12. 2004
Katuščák Svetozár	TAPPI	member	01. 01. 2005
Šutý Štefan	Association of the pulp and paper industry, Czech republic (member of EUCEPA)	member	01. 01. 2000 -
Šurina Igor	Association of the pulp and paper industry, Czech republic (member of EUCEPA)	member	01. 01. 1998 -
Vrška Milan	IASPM – International Association of Scientific Papermakers (USA)	member	1995 -

## E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Milichovský Miloslav	TU Pardubice	Czech Republic	June 2007

## F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Katuščák S.	Bern – Wimmis	Swiss	26.3.-28.3.07
Jablonský M.	Bern – Wimmis	Swiss	12.4.-24.4.07
Holubková S.	Bern – Wimmis	Swiss	12.4.-24.4.07
Beňova L.	Bern – Wimmis	Swiss	12.4.-24.4.07
Katuščák S.	ZFB-Leipzig	Germany	23.4.-26.4.07
Katuščák S.	University of Wien	Austria	2.5.07
Katuščák S.	SOBU GbR	Germany	9.5.-12.5.07
Tiňo R.	Conference SCPP	Czech republic	21.5.07
Figedyova S.	Conference SCPP	Czech republic	21.5.07
Vizarova K.	Conference SCPP	Czech republic	21.5.07
Suty Š.	Conference SCPP	Czech republic	21.5.07
Katuščák S.	Institute Ljubljana	Slovenia	1.10.07
Katuščák S.	University of Pardubice	Czech republic	6.6.07
Tiňo R.	University of Budapest	Hungary	17.9. – 19.9.07
Katuščák S.	ZFB Leipzig	Germany	8.10-9.10.07
Katuščák S.	SOBU GbR	Germany	15.10.-19.10.07
Katuščák S.	Rome – Ravenna	Italy	5.12.-7.12.07
Jablonský M.	Rome – Ravenna	Italy	5.12.-7.12.07

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Botková Martina	Výroba vlnitých lepeniek a ich vplyv na životné prostredie	Šutý, Š.
Hačková Andrea	Overenie účinnosti modifikačnej sústavy obsahujúcej antioxidant na stabilizáciu papierových nosičov informácií	Vizárová, K.
Kišová Martina	Vlastnosti papiera – krútenie a zvlnenie	Šutý, Š.
Kučerková Lucia	Bleached Pulps Brightness Reversion	Vrška, M.
Savkaničová Ivana	Sledovanie degradačných zmien pri starnutí papiera	Jablonský, M.
Sklenářová Monika	Využitie nízkoenergetickej plazmy a termickej analýzy v oblasti záchrany kultúrneho dedičstva	Tiňo, R.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Beňová Lívia	Studies about Methods of Modification and Degradation Processes in Lognocellulosic Materials	Katuščák, S.
Geguššová Andrea	Utilization of Nanoparticles for Modification Properties of Finishings Used for Treatment of Wood Surface	Tiňo, R.
Holúbková Silvia	The Comparative Evaluation of Known Paper Conservation Processes	Katuščák, S.
Jurčo Juraj	The Study of Brightness Reversion of Hardwood Bleached Kraft Pulp	Vrška, M.
Kazíková Jana	Development of Antioxidants into Modifying Systems of Book Conservation	Vizárová, K.
Letko Michal	Influence of Hardwood Mixture Composition and Delignification on SAQ Unbleached Pulp Yield	Vrška, M.

Mikulášik Radoslav	Tall Oil as a Source of Bio-fuels	Šurina, I.
Nováková Erika	Study of Influences of Plasma Treatment on Surfaces of Wooden Materials	Tiňo, R.
Petriláková Katarína	The Influence of Paper Modification Treatment on Properties of Paper	Šutý, Š.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Jablonský, M.	Influence of Oxidative Processes on Lignocellulosic Materials	Katuščák, S.

### D. Habilitation Theses

Name	Title of Thesis	Supervisor
Vrška, Milan	A New Types of Fibers for Paper Industry, Thesis, FCHPT Bratislava, p. 164, 2007	Katuščák, S.

## VIII. PUBLICATIONS

### Journals

- [1] Ondrášková, M., Ráheľ, J., Zahoranová, A., Tiňo, R., Černák, M.: Plasma activation of wood surface by Diffuse coplanar surface barrier discharge, *Plasma chemistry and processing*, Accepted: 25 December 2007  
<http://www.springerlink.com/content/084t050427u172k2/fulltext.html>
- [2] Vrška M., Jablonský M., Tiňo R.: Effect of pH on the kinetics of cellulose degradation and delignification in ozonization oxygen delignified hardwood kraft pulp, *Wood Research*, 52(1): 47-55, 2007
- [3] Vrška M., Jablonský M., Tiňo, R., Katuščák, S.: Effect of pH and temperature on cellulose chain scission number in ozonization of oxygen delignified hardwood kraft pulp. *Wood research*, 52(2): 49-56, 2007
- [4] Tiňo, R., Jablonský, M., Katuščák, S.: The effect of ageing on variability of the UV-VIS spectroscopic lignin estimation in paper. *Wood Research*, 52(4), 2007, 61-68.
- [5] Ujhelyiová, A., Bolhová, E., Oravkinová, J., Tiňo, R., Marcinčin, A.: Kinetics of dyeing process of blend polypropylene/polyester fibres with disperse dye. *Dyes and Pigments*, 72 (2007) 212-216
- [6] Gemzická, E., Vrška, M., Jorík, V.: Nánosy v celulózke. Scales in Kraft Pulp Mill. *Papír a celulóza*, č. 7-8, zv. 62, str. 234-236, 2007.
- [7] Kirschnerová, S., Vrška, M., Vizárová, K., Katuščák, S.: Artificial ageing of wood containing paper in the stack. *Papír a celulóza*, 62 (1) 2007, p.7-10.

### Conferences

- [1] Beňová, L., Katuščák, S., Tiňo, R.: Hodnotenie zmeny polarit LCM účinkom nízkoenergetickej plazmy pomocou novej metódy hodnotenia sacej schopnosti povrchu podľa adsorpčnej vyfarbovacej metódy v systéme CIE. In: *Modifikácie celulózových materiálov*. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 50.
- [2] Botková, M.: Výroba vlnitej lepenky a jej dopad na životné prostredie. In: *Modifikácie celulózových materiálov*. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 59.
- [3] Figeďyová, S.: Stanovenie obsahu karboxylových kyselín a ich iónov v deacidifikovanom a nedeacidifikovanom urýchlene starnutom papieri. In: *Modifikácie celulózových materiálov*. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 51.
- [4] Fikar, M., Čirka, L., Katuščák, S., Tiňo, R.: Informačné technológie pre projekt KnihaSK. Zborník príspevkov z konferencie WPP 2007, 30.-31.10.2007 Čilistov, ISBN 978-80-227-2757-0, s 5-6.
- [5] Holúbková, S., Katuščák, S., Jablonský, M., Bukovský, V.: Porovnávacie hodnotenia známych procesov deacidifikácie kníh. In: *Modifikácie celulózových materiálov*. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 54 – 55.
- [6] Jablonský, M., Holúbková, S., Bukovský, V.: Vplyv modifikácie papiera procesom SoBu na stálosť papiera. In: *Modifikácie celulózových materiálov*. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 14 – 15.
- [7] Kazíková, J., Vizárová, K., Považanec, F., Kirschnerová, S.: Vývoj antioxidantov do modifikačných sústav na konzervovanie kníh. In: *Modifikácie celulózových materiálov*. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 56.
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- [11] Kronek, J., Vizárová, K., Kirschnerová, S.: Modifikácia papiera hydrofilným polymérom na báze 2-oxazolinov. In: Modifikácie celulóзовých materiálov. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 20 – 21.
- [12] Kučerková, L., Vrška, M., Jurčo, J.: Reverzia belosti bielených buničín. In: Modifikácie celulóзовých materiálov. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 60
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- [14] Mikulášik, R., Kosinková, J., Ház, A., Katuščák, S., Šurina, I.: Produkty spracovania LCM a využitie ich energetického potenciálu. In: Modifikácie celulóзовých materiálov. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 42.
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- [22] Šutý, Š., Petriláková, K.: Štúdium procesu hornifikácie počas urýchleného starnutia. In: Modifikácie celulóзовých materiálov. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 9 – 10.
- [23] Tiňo, R., Beňová, L., Nováková, E.: Úprava polarity povrchu smreka (*Pinus excelsa*) účinkom atmosférickej DCSBD plazmy vo vzduchovej atmosfére. In: Modifikácie celulóзовých materiálov. Wood, Pulp and Paper 2007. 30.-31.10.2007, Čilistov, ISBN 978-80-227-2757-0, s. 46 – 47.
- [24] Tiňo, R., Beňová, L., Nováková, E.: Úprava polarity povrchu smreka (*Pinus excelsa*) účinkom atmosférickej DCSBD plazmy vo vzduchovej atmosfére. Zborník príspevkov z konferencie WPP 2007, 30.-31.10.2007 Čilistov, ISBN 978-80-227-2757-0, s. 46.
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- [27] Figedyová, S., Hroboňová, K., Jablonský, M., Katuščák, S.: Kinetics of lower organic acid formation during accelerated ageing of paper. V 5th International Student's Seminar. Chemistry and Technology of Wood, Pulp and Paper, Brno, Trade Fair EmbaxPrint, 2007
- [28] Mikulášik R., Haz A., Šurina I.: Termická analýza pyrolýzných produktov dreívnej biomasy, ŠVOČ, FCHPT STU, Bratislava, 2007
- [29] Mikulášik R., Kosinková J., Šurina I.: Produkty pyrolytického rozkladu dreívnej biomasy a ich využitie v kozmetickom priemysle, ŠVOČ, FCHPT STU, Bratislava, 2007
- [30] Lazorík, J., Hačkóová, A., Vizárová K., Kirschnerová S.: Sledovanie degradačných zmien pri starnutí papiera, ŠVOČ, FCHPT STU, Bratislava, 2007
- [31] Kučerková L., Vrška, M.: Reverzia belosti bielených buničín, ŠVOČ, FCHPT STU, Bratislava, 2007
- [32] Savkaničová I., Jablonský, M.: Sledovanie degradačných zmien pri starnutí papiera, ŠVOČ, FCHPT STU, Bratislava, 2007
- [33] Botková M., Šutý, Š.: Výroba vlnitej lepenky a jej vplyv na životné prostredie, ŠVOČ, FCHPT STU, Bratislava, 2007
- [34] Sklenářová M., Tiňo, R.: Využitie nízkoenergetickej plazmy v oblasti záchrany kultúrneho dedičstva, ŠVOČ, FCHPT STU, Bratislava, 2007
- [35] Kišová M., Šutý Š.: Vlastnosti: papiera – krútenie a zvlnenie, ŠVOČ, FCHPT STU, Bratislava, 2007

## Projects

- [1] Vrška, M.: ZoD 27/2007 The Study of Wood Mixture Composition on SAQ Pulp Yield. Smurfit Kappa a.s. Štúrovo, 130 000.- Sk
- [2] Vrška, M.: ZoD 88/2005 Supplement N. 1, The Study of Bleached Hardwood Kraft Pulp Brightness Reversion. The Using of Hydrogen Peroxide in Oxygen delignification of Pulp., Mondi SCP a.s. Ružomberok, 210 000.- Sk
- [3] Šutý, Š.: ZoD 101/07 Technology of papermaking (basic course), SHP group Harmanec, 360 000,- Sk.
- [4] Šutý, Š.: ZoD 119/07 Technology of papermaking (advance course) SHP group Harmanec, 400 000,-Sk.



## DEPARTMENT OF MANAGEMENT

### Head of Department:

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## I. STAFF

### Associate Professors:

Pavel Herzka, Ph.D.; Marta Šostroneková, Ph.D. (till 31. 1. 2007); Dušan Špirko, Ph.D.; Irina Bondareva, Ph.D. (from 1. 9. 2007)

### Assistant Professors :

Štefan György, Ph.D. (till 30. 6. 2007); Dr. Milan Majerník; Jana Kajanová, Ph.D.; Jana Plchová, Ph.D.; Monika Zatrochová, Ph.D.; Martina Kuperová; Pavol Olejník, Rudolf Stejskal (from 1. 7. 2007).

### Technical staff:

Katarína Macušková

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of Computerized Technique

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Fundamentals of Environmental Philosophy	(2-0 h)	Špirko
	Philosophy	(2-0 h)	Špirko
	Fundamentals of Law	(2-0 h)	György, Stejskal
<b>2. semester (Bc)</b>	Fundamentals of General Theory of Economy	(4-0 h)	Majerník
	Fundamentals of General Theory of Economy	(2-2 h)	Majerník
	Fundamentals of General Theory of Economy	(2-0 h)	Majerník
	General Theory of Economy	(2-0 h)	Majerník
	Fundamentals of Law	(2-0 h)	György, Stejskal
<b>3. semester (Bc)</b>	Human Resource Management	(2-0 h)	Herzka
	Economics and Company Management	(2-2 h)	Herzka, Plchová
	Logics	(2-0 h)	Špirko
<b>4. semester (Bc)</b>	Fundamentals of Logistics	(2-1 h)	Baran, Kuperová, Olejník
	Enterprise Economy	(2-0 h)	Herzka
<b>5. semester (Bc)</b>	Economics and Management of Enterprise	(2-2 h)	Kajanová, Kuperová, Olejník
	Corporate Finances	(2-2 h)	Baran
	Economics and Company Management	(2-2 h)	Herzka
	Quality Management	(2-1 h)	Herzka, Plchová, Olejník
	Marketing	(2-2 h)	Špirko
	Social Communication	(2-0 h)	Špirko
<b>6. semester (Bc)</b>	Accounting	(2-2 h)	Kajanová
	Introduction to Law	(2-0 h)	György, Stejskal
	Semester Project	(0-4 h)	Baran
<b>1. semester (MSc)</b>	Costs and Prices	(2-2 h)	Kajanová
	Enterprise Economy	(2-2 h)	Herzka
	Operations Research	(3-2 h)	Kuperová
	Strategic Management of Chemical Plants	(2-1 h)	Herzka, Kuperová
	Supplying and distribution logistics	(2-2 h)	Kuperová
<b>2. semester (MSc)</b>	Capital Market and Corporation Finances	(2-0 h)	Baran, Olejník
	Financial Market	(2-2 h)	Baran, Olejník
	Production Management	(2-1 h)	Herzka, Kuperová
	Management of Investment Development	(1-1 h)	Herzka, Plchová

	Marketing	(2-0 h)	Špirko
	Marketing	(2-2 h)	Plchová
	Operational Analysis	(2-2 h)	Kuperová
<b>3. semester (MSc)</b>	Analysis of Corporate Economics	(3-2 h)	Baran, Majerník, Olejník,
	Financial Management	(3-2 h)	Baran, Bondareva
	Fundamentals of Mercantile and Financial Law	(2-0 h)	Stejskal
	System of Taxes	(2-0 h)	Baran, Plchová
	Annual Project	(0-4 h)	Baran
<b>4. semester (MSc)</b>	Ethics and Etiquette in Managerial Activities	(1-0 h)	Špirko
	Fundamentals of Industrial Law	(2-0 h)	Kajanová
	Management of Small- and Medium-sized Enterprises	(2-0 h)	Baran, Olejník
	Diploma Thesis	(18 h)	Baran

#### IV. CURRENT RESEARCH PROJECTS

##### A. VEGA Project No. 1/3768/06, Development of controlling as a management instrument in enterprises of the chemical, pulp and paper, and food industry

Commission VEGA number 16 for Economics and Juridical Sciences

**Principal investigator:** Assoc.Prof. Dušan Baran, Ph.D.

**Deputy of principal investigator:** Jana Kajanová, Ph.D.

**Project participants:** Assoc. Prof. Pavel Herzka, Ph.D.; Assoc.Prof. Dušan Špirko, Ph.D.; Dr. Milan Majerník; Jana Plchová, Ph.D.; Monika Zatrochová, Ph.D.; Ing. Martina Kuperová; Katarína Macušková.

The research project deals with the up-to-date and very important problems of the research and application of the modern management methods considered from the aspects of economic sciences. The project analyses the current state of the application and implementation modern management methods in the conditions of the Slovak Republic and abroad, especially in EU and USA. The project considers the external and internal conditions of the above-mentioned application and formulates the solutions for creating the scientific background of subsystem and controlling instruments (subject, key words, explanations and definitions of the research).

Following the presented analyses, the project defines and develops already used methods, procedures, models and management techniques under the conditions of the market economy of the transforming states.

Subsequently, the project recommends the unified models of solution, applications and the implementation of the subsystem and controlling instruments into the entrepreneurial sphere.

The project contributes to developing the scientific and theoretical basis and above all to the development of modern management methods.

Project duration: from 1 January 2006 to 31 December 2008

##### A. VEGA Project No. 1/3610/06, Philosophical, Ethical, Social and Environmental Aspects of the Engineer-Technological and Managerial Activities - Professional, Social and Environmental Responsibility of the Engineer and Manager

Commission VEGA number 12 for Social Sciences (Philosophy, Sociology, Politology, Theology)

**Principal investigator:** Assoc. Prof. Dušan Špirko, Ph.D.

**Deputy of principal investigator:** Jana Plchová, Ph.D.

**Project participant:** Assoc.Prof. Dušan Baran, Ph.D.; Jana Kajanová, Ph.D.; Štefan György, Ph.D.

The project is aimed do identify, analyze and develop some philosophical-methodological, ethical (also some legislative) and environmental aspects of the future professional activities carried out by graduates of the Slovak University of Technology, especially of the Faculty of Chemical and food Technology.

The practical purpose of the project is to apply and integrate the above-indicated aspects into the process of the professional preparation of engineering-technological and managerial workers; these assignments will be implemented on considering some peculiarities of the chemistry and food-industry and emphasizing the principles of the professional, social and environmental responsibility of the engineer and manager.

Analysis and Development of the Ethical Aspects of Managerial Activities (the Source Principles of Business Ethics - the Principles of the Social Responsibility of a Manager).

Project duration: from 1 January 2006 to 31 December 2008

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Frucona Košice, Inc.	Material-technical cooperation	Ing. Ján Király, general manager and chairman of the Board of directors	
CCW, Ltd. Bratislava	Pedagogic cooperation	Dipl.Ing. Magdaléna Sulanová, marketing manager	
Slovak association of small enterprises	Scientific-technical cooperation	Ing. Vladimír Sirotko, PhD.	
Stock exchange, Inc. in Bratislava	Pedagogic cooperation	Ing. Barbora Lazorová	
TENTO, Inc. Žilina	Material-technical cooperation	Ing. Marián Majtán, financial director	
Chemosvit, Inc. Svit	Material-technical cooperation	Ing. Vlad. Balogh, Ing. Ján Olekšák	
Matej Bel University, Faculty of Economics, Banská Bystrica	Pedagogical cooperation	Assoc. Prof. Jaroslav Ďado Prof. Ľubica Lesáková Prof. Marková	
University of Economy, Bratislava	Pedagogical cooperation	Prof. Július Alexy Prof. Miroslav Majtán Prof. Štefan Slávik Assoc. Prof. Šubertová Elena	
University of Žilina, Faculty of Economics, Transport and Communication	Pedagogical cooperation	Prof. Štefan Cisko Prof. Štefan Hittmar Assoc. Prof. Jozef Strišš Assoc. Prof. Szilágyi	
Slovak University of Technology, Faculty of Materials Science and Technology, Trnava	Pedagogical cooperation	Prof. Jozef Sáblik Assoc.Prof. Miloš Čambal Assoc. Prof. Alexander Štrbka Assoc. Prof. Peter Sakál	
Slovak University of Technology, Faculty of Mechanical Engineering	Pedagogical cooperation	Assoc. Prof. Štepka Igor Prof. Dita Hekelová	
Slovak University of Technology, Faculty of Civil Engineering	Pedagogical cooperation	Prof. Koloman Ivanička Assoc. Prof. Mária Zúbková Prof. Trávník Igor	
Alexander Dubček University, Faculty of Social-Economic Relations, Trenčín	Pedagogical cooperation	Doc. Miroslav Mečár, CSc., Assoc. Prof. Sergej Vojtovič	
Comenius University Bratislava, Faculty of Management	Pedagogical cooperation	Prof. Sedlák Michal Assoc.Prof.Ľubica Bajzíková	
Technical University, Faculty of Mechanical Engineering, Košice	Pedagogical cooperation	Prof. Ing. Igor Liberko, CSc., Doc. Ing. Jozef Mihok, CSc.	

### B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
BORSOD CHEM Moravian Chemical Plants, Ostrava Czech Republic	Material-technical and pedagogic cooperation	Ing. Alexander Pálffy, CSc. general manager	
University of Economics, Faculty of Business Administration, Prague, Czech Republic	Pedagogical cooperation	Prof. Eduard Stehlík, Prof. Ing. Kisligerová, PhD. Assoc. Prof. Ludmila Mládková, Assoc. Prof. Jan Koudelka	
Institute of Chemical Technology, Faculty of Chemical Engineering, Prague, Czech Republic	Pedagogical cooperation	Prof. Ivan Gros Assoc. Prof. Stanislava Grosová	

Karol Adamiecki University of Economics in Katowice, Faculty of Management, Poland	Pedagogical cooperation	Prof. Kornelia Karcz Prof. Žofia Kedzior	
University of Economics in Krakow, Faculty of Management, Poland	Pedagogical cooperation	Prof. Jan W. Wiktor Assoc. Prof. Grażyna Woźnievska	
Tallin Technical University	Pedagogical cooperation	Prof. habil. doctor Vaino Rajangu	
Vilnius University, Faculty of Humanities in Kaunas, Lithuania	Pedagogical cooperation	Prof. Vítuskas Vengrauskas Assoc. Prof. Jogaila Mačerinskas Assoc. Prof. Irena Mačerinskas	
Masaryk University Brno, Faculty of Economics and Administration, Czech Republic	Pedagogical cooperation	Prof. Blažek Miroslav Dr. Viliam Záthurecký	
Technische Universität (Technical University) Darmstadt, Institut für Betriebswirtschaftslehre	Pedagogical cooperation	Prof. Dr. Günther Specht	
Lvov Polytechnic National University, Institute of Economics and Management, Ukraine	Pedagogical cooperation	Assoc. Prof. Natalia Čuchraj	
Kiev National Economic University, Ukraine	Pedagogical cooperation	Prof. I. L. Reshetnikova	
University of Pardubice, Faculty of Chemical Technology, Czech Republic	Pedagogical cooperation	Assoc. Prof. Hana Lošťáková, Assoc. Prof. Oto Machač	
University of Daugavpils, Latvia	Pedagogical cooperation	Prof. Gončarovs	
Technical University of Riga, Latvia	Pedagogical cooperation	Prof. S. Didenko, Dean	
University of Kuopio, Finland	Pedagogical cooperation	Prof. Lace Nehlia	

### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Baran, D.	Slovak Society for Industrial Chemistry	member	from 2000
György, Š.	Slovak Society for Industrial Chemistry	member	from 2000
Herzka, P.	Slovak Society for Industrial Chemistry	member	from 2000
Kajanová, J.	Slovak Society for Industrial Chemistry	member	from 2000
Kuperová, M.	Slovak Society for Industrial Chemistry	member	from 2000
Macušková, K.	Slovak Society for Industrial Chemistry	member	from 2000
Majerník, M.	Slovak Society for Industrial Chemistry	member	from 2000
Olejník, P.	Slovak Society for Industrial Chemistry	member	from 2006
Plochová, J.	Slovak Society for Industrial Chemistry	member	from 2000
Špirko, D.	Slovak Society for Industrial Chemistry	member	from 2000
Špirko, D.	Slovak Philosophical Association	member	from 1990
Špirko, D.	Slovak Philosophical Association	vice-president	2000 - 2004
Špirko, D.	Slovak Society of Military History and Historical Guns Shooters	secretary	from 1993
Špirko, D.	Slovak Shooting Federation	member	from 1992
Zatrochová, M.	Slovak Society for Industrial Chemistry	member	from 2000

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Baran, D.	Corporate Governance Assotiation	member	from 2004
Baran, D.	Czech Marketing Society	member	from 2004
Kajanová, J.	Czech Marketing Society	member	from 2006
Špirko, D.	Central European Napoleonic Society	member	from 2000

## E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Jemelka Petr, doc. PhDr., Dr.	PF MU Brno	Czech Republic	January 2007 / 1 day
Mačerinskas, J. Assoc.Prof., PhD.	Vilnius University, Kaunas Faculty of Humanities	Lithuania	January 2007 / 2 days
Šikýř Martin, Ing.	ČVUT Fakulta dopravní Praha	Czech Republic	September 2007 / 2 days
Stříteský Václav Ing.	EF VŠB Ostrava	Czech Republic	September 2007 / 2 days
Stříteský, Marek, Ing.	Fakulta chemicko-inženýrská, VŠCHT Praha	Czech Republic	September 2007 / 2 days
Šánová Petra, Ing, PhD., Bc. Anna Němcová	FCHI, VŠCHT, Praha	Czech Republic	September 2007 / 2 days
Nožička Jiří, Ing.	FCHT U P Katedra ekonomiky a management....	Czech Republic	September 2007 / 2 days
Vávra Jan, Ing. PhD.	FCHT U P Katedra ekonomiky a management....	Czech Republic	September 2007 / 2 days
Lošťáková Hana, Prof. Ing. PhD.	Filozofická fakulta, UP Olomouc	Czech Republic	September 2007 / 2 days
Švandová Zuzana, Ing.	Hospodářská fakulta TU v Liberci	Czech Republic	September 2007 / 2 days
Guriliová Katerina	Institute of International Relations of Kiev Taras Shevchenko University	Ukraine	September 2007 / 2 days
Lytvyn Olena, PhD.	Institute of International Relations of Kiev Taras Shevchenko University	Ukraine	September 2007 / 2 days
Branská Lenka, Ing. PHD.	Katedra marketingu, FPH, VŠE Praha	Czech Republic	September 2007 / 2 days
Hes Aleš, doc. Ing. CSc. Ivana Hesová, Ing.	Katedra obchodu a financí, Provozně ekonomická fakulta ČZU, Praha	Czech Republic	September 2007 / 2 days
Myslivcová Světlana, Ing.	Katedra společenských věd Fakulta stavební, ČVUT Praha	Czech Republic	September 2007 / 2 days
Dalia Barnatonyte	Kaunas university od Technology	Lithuania	September 2007 / 2 days
Jadvyga Ciburienė	Kaunas university od Technology	Lithuania	September 2007 / 2 days
Šmaizienė Ingrida PhD. student	Kaunas University of Technology	Lithuania	September 2007 / 2 days
Barnatonyte Dalia, Assoc, Prof. Dr.	Kaunas University of Technology, Faculty of Economics and management, Dep. Od Economics and international trade	Lithuania	September 2007 / 2 days
Gabryšová Marie, Dr. Ing.	Kaunas University of Technology, Faculty of Social Sciences	Lithuania	September 2007 / 2 days
Cheglei Veronika, masters degree, PhD	OTP Bank, Souther Branch of the Crimean Agricultural and Technological Unviersity of National Agrarian University	Ukraine	September 2007 / 2 days
Ziomek Agnieszka, doctor	Poznan university of Economics	Poland	September 2007 / 2 days
Prsybysz Jerzy, doctor	Poznan University of Technology, Faculty of Computing Science and Management Institute of Management Engineering	Poland	September 2007 / 2 days
Przybysz Jerzy, doctor	Poznan University of technology, Faculty of Computing Science and Management, Institut of Management Engineering	Poland	September 2007 / 2 days
Elina Gaile- Sarkane, Dr. oec.	Riga technical University, Faculty of Engineering Economics	Czech Republic	September 2007 / 2 days

Name	Organisation or Institution	State	Date / Duration
Ketners Karlis, Dr. oec. RTU assoc. Prof., Solvita Zvidrina, Mg oec. RTU doktoral student	Riga technical University, Faculty of Engineering Economics Customs and Tax department	Latvia	September 2007 / 2 days
Dědková, Jaroslava, PhDr. Ing., PhD.	Technická univerzita Liberec, Hospodárska fakulta	Czech Republic	September 2007 / 2 days
Honzáková Iveta, Ing.	Technická univerzita Liberec, Hospodárska fakulta	Czech Republic	September 2007 / 2 days
Hyršlová Jaroslava Doc. Ing. PhD.	UP FCHT Katedra ekonomiky	Czech Republic	September 2007 / 2 days
Pecinová Zuzana, Ing. PhD.	UP FCHT Katedra ekonomiky	Czech Republic	September 2007 / 2 days
Vičková Vladimíra, Ing. PhD.	UP FCHT Katedra ekonomiky	Czech Republic	September 2007 / 2 days
Mackevičius Vytautas Sudžius Vytautas	Vilnius Uni, Dep. Of Business Vilnius Gediminas technical Uni. Dep. Of Finance engineering	Lithuania	September 2007 / 2 days
Koudelka Jan, doc. Ing. CSc.	VŠE Katedra marketingu	Czech Republic	September 2007 / 2 days
Doc. Ing. Ludmila Mládková, PhD.	VŠE Praha	Czech Republic	September 2007 / 2 days
Prokopová Rut, Ingh.	VŠE Praha, Katedra ekonometrie	Czech Republic	September 2007 / 2 days
Botek Marek, Mgr. Ing. PhD.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Hloušková Petra, Ing.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Hradecký Pavel, Ing. PhD.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Kodera Jiří, Ing.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Kutnohorská Olga, Ing. Hradecký Pavel, Ing. PhD.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Nolčová Veronika Ing.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Strachotová Dana Ing. PhD. Strachota Svatopluk, Ing.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Strachotová Dana Ing. PhD.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Vegnerová Petra, Ing.	VŠCHT Praha	Czech Republic	September 2007 / 2 days
Beranová Michaela, Ing.	VUT Brno, Fakulta podnikatelská	Czech Republic	September 2007 / 2 days

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Baran, D.	EPI Kunovice, international scientific conference	Czech Republic	January 2007 / 3 days
Baran, D.	VUT Brno, international scientific conference	Czech Republic	January – February 2007 / 5 days
Kajanová, J.	EVIDA Association, international scientific conference	Czech Republic	March / 2 days

Baran, D. Olejník, P. Kajanová J.	Riga technical University, Kaunas University of Technology, international scientific conferences	Latvia, Lithuania	April 2007 / 11 days
Baran, D.	ČSAD Hodonín, scientific project consultations	Czech Republic	Mai 2007 / 2 days
Baran, D. Olejník, P.	VŠCHT, FCHI, UERCHPP Praha, international scientific conference, scientific project consultations	Czech Republic	Mai 2007 / 3 days
Kajanová, J.	EVIDA Association, international scientific conference	Czech Republic	August / 2 days
Baran, D. Kajanová, J. Olejník, P.	VUT Brno, international scientific conference	Czech Republic	September 2007 / 3 days
Baran, D.	VŠCHT, FCHI, UERCHPP Praha, scientific project consultations	Czech Republic	November 2007 / 1 day

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Bugri, M.	Cost management in the company 's practice	Kajanová, J.
Ficzová, M.	Direct marketing – his responsibilities and forms in the marketing communication framework	Špirko, D.
Godóová, B.	Balance sheet and profit and loss account in double entry accounting	Kajanová, J.
Idešicová, K.	Products as a part of marketing-mix	Plchová, J.
Kolečár, I.	Motivation in relation to the stimulation of employees	Kajanová, J.
Lazovská, S.	Management firm 's and its basic function	Šostroneková, M.
Miklošková, L.	Corporate Financing - Resources and Needs	Baran, D.
Poročák, P.	Marketing Communication: Advertising	Plchová
Rečičár, J.	Aspects of the personnel problems considered in the particular workplace	Herzka, P.
Škrabák, P.	Logistic Components of Distribution	Kuperová, M.
Varga, M.	Bank credit policy and its possibilities of influence for firm 's financial policy	Zatrochová, M.
Turáková, A.	Care of employees in the company and collective bargaining	Herzka, P.

### B. Graduate Theses (M.Sc. Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Bublávek, J.	Application of Marketing in a Selected Bussiness Firm	Špirko, D.
Cagalíneck, M.	Function of a freight forwarder in the logistic system	Kuperová, M.
Ferenčíková, L.	Financial analysis of the selected medium-size enterprise	Olejník, P.
Gabčová, Z.	Analysis of Interdependences of the Level of Supplies, Customer Services and Exact Sale Predictions	Kuperová, M.
Galba, J.	Public Procurement	Plchová, J.
Krkošková, N.	Exploitation of the methods of cost controllinf in the elektrotechnical company	Baran, D.
Návojská, E.	Results of the financial-economic analysis in the chemical company	Baran, D.
Pápyová, B.	Company Financial Analysis	Majerník, M.
Pašeková, K.	Calculations as an component of the intracompany controlling	Kajanová, J.
Pohanková, L.	Company controlling and information system	Baran, D.
Purová, V.	Analysis of competition and marketing environment by the certification body QSCrt, limited liability company	Zatrochová, M.
Sluková, A.	Financial-ekonomick analysis of a chemical company	Olejník, P.

## VIII. PUBLICATIONS

### Book

- [1] RYBÁRIK, J., DUDA, E., KOPŠOVÁ, O., HUSZÁR, Š., BRINZOVÁ, M., ODLEROVÁ, E., PAUKOV, M., ŠPIRKO, D., TURAN, D.: Humanization and the environment. - Bratislava: STU v Bratislave, 2007. - 164 p. - ISBN 978-80-227-2591-0. (in Slovak)

### Part of Book

- [1] BARAN, D.: Finančná stratégia podniku. - 24 p. In: Strategický manažment v praxi manažéra. - Trnava: Tripsoft, 2007. - ISBN 978-80-89291-04-5. - p. 246-270. (in Slovak)

### Article in journal

- [1] BARAN, D., HROTKO, L., OLEJNÍK, P.: Economic Value Added- Eva. In: Ekonomika ir vadyba Economics and management. - ISSN 1822-6515. - 12 (2007), p. 669-675. (in English)
- [2] KAJANOVÁ, J.: Riadenie vzťahov so zákazníkmi. In: Vinič a víno. - 7-5 (2007), p. 112-113. (in Slovak)

### Article in conference proceedings

- [1] BARAN, D., BARANOVÁ, D.: An Enterprise and its Financial Relations with Foreign Countries. In: Management, Economics and Business Development in the new European Conditions : V. International Scientific Conference. Brno, 25-26 May 2007. - Brno : CERM, 2007. - ISBN 978-80-7204-532-7. - nestr. (in English)
- [2] BARAN, D., HROTKO, L.: Aplikácia controllingu v elektrotechnickom podniku. In: Festive Scientific Conference on the Occasion of 15th Anniversary of the Establishment of Faculty of Business and Management, Brno University of Management. - ISBN 978-80-214-3482-0, nestr. (in Slovak)
- [3] BARAN, D.: Finančná analýza. In: Modern Management MOMAN 07. ISBN 80-86596-87-7, p. 21-30. (in Slovak)
- [4] BARAN, D.: Fiškálne a parašiskálne zaťaženie daňových subjektov v slovenskej republike. In: Vysoká škola jako facilitátor rozvoje společnosti a regionu. - ISBN 80-7314-107-8. - p. 203-209. (in Slovak)
- [5] BARAN, D., BARANOVÁ, D.: Manažment menových rizik podniku. In: Obchod, jakost a finance v podnicích - determinanty konkurenceschopnosti V : Sborník. Mezinárodní vědecká konference, Praha 16.-17.5.2007. - Praha : Česká zemědělská univerzita v Praze, 2007. - ISBN 978-80-213-1661-4. - p. 13-15. (in English)
- [6] BARAN, D.: Postavenie investorov v SR. In: Zodpovednosť odborníka (inžiniera, manažéra, učiteľa) v súčasnom svete: Zborník príspevkov z medzinárodného interdisciplinárneho vedeckého kolokvia. Bratislava, 25. 1. 2007. - Bratislava: STU v Bratislave, 2007. - ISBN 978-80-227-2600-9. - p. 21-27. (in Slovak)
- [7] BARAN, D., OLEJNÍK, P.: RSW Method - One of the System Methods of Early Warning. In: Towards Knowledge-based Economy & Enterprise Management: Diagnostics, Strategy, Effectiveness. - ISBN 978-9984-768-6. - nestr. (in English)
- [8] BARAN, D., BARANOVÁ, D.: The Change in Relations with Foreign Countries after Accession of the Slovak Republic to the European Union. In: Education and Economy 2007 : Materials of international scientific conference/Tallinn, 2007. - Tallinn: Tallinn University of Technology, 2007. - ISBN 978-9985-59-725-5. - p. 7-9. (in English)
- [9] BARAN, D., PÁLFFY, A., MIKLOŠ, M.: Zhodnotenie výsledkov finančného zdravia skúmaného podniku za posledných šesť rokov. In: Modern Approaches to Corporate Management. 17th International Scientific Conference. Bratislava, Slovak Republic, 6.-7.9.2007: 17. medzinárodná vedecká konferencia. Bratislava, 6.-7.9.2007. - Bratislava: STU v Bratislave, 2007. - ISBN 978-80-227-2750-1. - p. 48-76. (in Slovak)
- [10] GYÖRGY, Š.: Niektoré právne aspekty zodpovednosti odborníka (inžiniera, manažéra, učiteľa) v súčasnom svete. In: Zodpovednosť odborníka (inžiniera, manažéra, učiteľa) v súčasnom svete: Zborník príspevkov z medzinárodného interdisciplinárneho vedeckého kolokvia. Bratislava, 25. 1. 2007. - Bratislava : STU v Bratislave, 2007. - ISBN 978-80-227-2600-9. - p. 57 - 58. (in Slovak)
- [11] HORVÁTHOVÁ, S., OLEJNÍK, P.: Importance of Company Financial/economic Analysis for Small and Medium-sized Enterprises. In: Modern Approaches to Corporate Management. 17th International Scientific Conference. Bratislava, Slovak Republic, 6.-7.9.2007: 17. medzinárodná vedecká konferencia. Bratislava, 6.-7.9.2007. - Bratislava: STU v Bratislave, 2007. - ISBN 978-80-227-2750-1. - p. 282-285. (in English)
- [12] KAJANOVÁ, J.: Creation, Development and Maintenance of the Competitive Advantage through Cost Management. In: Towards Knowledge-based Economy & Enterprise Management: Diagnostics, Strategy, Effectiveness. - ISBN 978-9984-768-6. - nestr. (in English)
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Conference. Bratislava, Slovak Republic, 6.-7.9.2007: 17. medzinárodná vedecká konferencia. Bratislava, 6.-7.9.2007. - Bratislava: STU v Bratislave, 2007. - ISBN 978-80-227-2750-1. - p. 638 - 643. (in Slovak)

### **Editorial Activities**

- [1] ŠPIRKO, D. (ed.): Zodpovednosť odborníka (inžiniera, manažéra, učiteľa) v súčasnom svete. Responsibility of Specialist (Engineer, Manager, Teacher) in Present-day World: International Interdisciplinary Scientific Colloquium. Bratislava, 25. 1. 2007. STU v Bratislave, 2007. - 136 s. - ISBN 978-80-227-2600-9. - 136 p. (in Slovak, Czech)
- [2] KAJANOVÁ, J. (ed.): Moderné prístupy k manažmentu podniku. Modern Approaches to Corporate Management: 17th International Scientific Conference. Slovak Republic, Bratislava, 6.-7. 9. 2007. - Bratislava: STU v Bratislave, 2007. - ISBN 978-80-227-2750-1. – 691 p. (in Slovak, English, Czech, Russian)

## DEPARTMENT OF LANGUAGES

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### Technical staff:

Katarína Vépyová;

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

English language classroom  
German language classroom  
Computer-operated Data Video Projector Room

### B. Research laboratories:

## III. TEACHING

### A. Undergraduate Study:

<b>1. semester (Bc)</b>	Technical English I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	Technical German I.	0/2/0	Oroszová
	English language I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
<b>1. semester (Bc)</b>	Russian language	0/2/0	Vrábelová
	German language	0/2/0	Oroszová
	English conversation	0/2/0	Vrábelová
<b>2. semester (Bc)</b>	Technical English II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	Technical German II.	0/2/0	Oroszová
	English language II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
<b>2. semester (Bc)</b>	Russian language	0/2/0	Vrábelová
	German language	0/2/0	Oroszová
	English conversation	0/2/0	Vrábelová
<b>3. semester (Bc)</b>	Technical English I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	Technical English II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
<b>3. semester (Bc)</b>	Russian Language	0/2/0	Vrábelová
	German Language	0/2/0	Oroszová
	English conversation	0/2/0	Vrábelová
<b>4. semester (Bc)</b>	Technical English I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	Technical English II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
<b>4. semester (Bc)</b>	Russian Language	0/2/0	Vrábelová
	German Language	0/2/0	Oroszová
	English conversation	0/2/0	Vrábelová
<b>5. semester (Bc)</b>	Technical English I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	Technical English II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová

<b>5. semester (Bc)</b>	Russian Language	0/2/0	Vrábelová
	German Language	0/2/0	Oroszová
	English conversation	0/2/0	Vrábelová
<b>6. semester (Bc)</b>	Technical English I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	Technical English II..	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language I.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová
	English language II.	0/2/0	Horáková, Oreská, Štefanovičová, Polóniová, Vrábelová

### B. Postgraduate Study:

3 semesters of an optional course in English for Academic Purposes /0/2/0; Oreská, Horáková

## V. CURRENT EDUCATION PROJECTS

### A. Creation of new testing materials for Specific Purposes at the University of Technology (Veronika Polóniová)

Aims of the project are: to prepare innovative testing materials suitably for the students (daily and external) of chemistry at FCHPT. On the basis of the book „English for Chemists“

### B. Poster Design and Presentation

Continual preparation of talented students for annual language competition.

Participation: 15 students

Date: 14 May 2007

Place: Department of Languages

References: [www.chtf.stuba.sk/kj](http://www.chtf.stuba.sk/kj) in: News after expiration

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Language departments of STU, Bratislava	Preparing syllabuses for EU exam courses UNICERT introducing besides the general language also the area of professional language	Polóniová Veronika, assistant professor, FCHPT STU, Radlinského 9, 812 37 Bratislava	01.01.2000 -
Specialist departments of FCHPT STU, Bratislava	Language section of the annual "Students' Scientific and Research Activity" competition - advisers Zálupský Peter, Šima Jozef	Horáková Magdaléna, head of Language Department, FCHPT STU, Radlinského 9, 812 37 Bratislava	01.01.1994 -
Slovak Association of Translators and Interpreters, Bratislava	Multimedia and Translation	Polóniová Veronika, assistant professor, FCHPT STU, Radlinského 9, 812 37 Bratislava	01.01.1998 -
University of Third Age, STU, Bratislava	Language course	Horáková Magdaléna, head of Language Department, FCHPT STU, Radlinského 9, 812 37 Bratislava, Oreská Alžbeta, assistant professor, FCHPT STU, Radlinského 9, 812 37 Bratislava	1. 1. 2006 - 1. 9. 2003 -
Language Centre, Rectorate of STU, Bratislava	Language courses: ZoD 2/330/06, ZoD 111/06	Kuželová Viera, head of Language Centre STU, Radlinského 9, 812 37 Bratislava	01.01.1994 -

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration

## C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Slovak Association of Translators and Interpreters, Bratislava	Translation and Interpreting in Technical English(Polóniová Veronika)	member	01.01.1998 -

## D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
British Council - Resource Centre, Bratislava	Teaching English for Specific Purposes (Horáková Magdaléna)	member	01.09.1996 -

## VIII. PUBLICATIONS

- [1] Polóniová,V.- Czuka,G.: Translation of Scientific Headlines. In: Translation from/into Languages with Limited Diffusion. Zborník z medzinárodnej konferencie Slovenskej asociácie prekladateľov a tlmočníkov, Budmerice, 3.-5.11.2007

## DEPARTMENT OF PHYSICAL EDUCATION

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### Technical Staff:

Gabriela Borsányiová

## II. TEACHING AND RESEARCH LABORATORIES

Gym 14x21 m – ground /volleybal, basketball, football/

Two Body Building rooms 15x5 m and 10x5 m

Two Table Tennis rooms

## III. TEACHING

Aerobic	(2 h)	A. Koláriková, L. Ondrušová
Kalanethics	(2 h)	A. Koláriková, L. Ondrušová
Harmonic gymnastics	(2 h)	A. Koláriková, L. Ondrušová
Healing gymnastic	(2 h)	A. Koláriková, E. Kováčová
Athletic sport	(2 h)	Ľ. Benko
Basketball	(2 h)	P. Bartok
Football	(2 h)	P. Bartok
Handball	(2 h)	M. Bobřík, M. Križan
Body building	(6 h)	M. Bobřík, P. Bartok, M. Križan, T. Laurenčík
Swimming	(2 h)	L. Vedralová, T. Laurenčík E. Kováčová, M. Križan
Canoeing and kayak	(4 h)	M. Bobřík
Volleyball	(2 h)	T. Laurenčík
Winter sports camp /skiing/		M. Bobřík, T. Laurenčík
Summer sports camp /		M. Bobřík, M. Križan
Floorball	(4)	Ľ. Benko, M. Križan T. Laurenčík, P. Bartok

## IV. RESEARCH PROJECT

State of Physical and Motor Development of Undergraduates of FCHFT STU in Bratislava (Miroslav Bobřík, Ľuboš Benko).

Swimming Ability of University Student in Slovakia (Lucia Ondrušová).

The intensity of movement load during the aquarobic of university student (Lucia Ondrušová).

Health weakened Students and their Adaptation on Physical Program in the Conditions of Integrated Physical Education at STU (Koláriková Andrea).

Creation of the Criteria for Intensity Assessment of Match and training Load in Sport Games (Križan Martin, Laurenčík Tomáš).

## V. COOPERATION IN SLOVAKIA

Faculty Physical Education and Sport of the Comenius University, Bratislava;

Research Institute of Physical Culture, Bratislava;

Institute of History, Slovak Academy of Sciences, Bratislava.

## VIII. PUBLICATIONS

### Books

[1] Kováčová, E.: Svalová nerovnováha a možnosti jej ovplyvňovania u 6 – 8 ročných žiakov. ISBN 978-80-89257-06-5.

## Chapter or pages in book

[1] Laurenčík, T.: Príprava a organizácia súťaží vo volejbale. In: Zapletalová a kol.: Volejbal. Základy techniky, taktiky a výučby, Bratislava, Univerzita Komenského, 2007, s. 126 – 134, ISBN 978-80-223-2280-5.

## Article in journal

[1] Bobřík, M.: 55 rokov kateder telesnej výchovy na STU v Bratislave. Telesná výchova a šport, roč. XVII, č. 2/2007, s. 8 – 11. ISSN 1335-2245.

[2] Bobřík, M.: 55 rokov hľadania vlastnej identity(návrat ku koreňom nášho poznania). Časopis Spektrum STU, roč. XIV., september 2007, s. 13 – 16. ISSN 1336-2593.

## Article in conference proceedings

[1] Bobřík, M. - Benko, L.: Analýza vzťahov medzi somatometrickými ukazovateľmi a ukazovateľmi funkčnej zdatnosti študentov FCHPT STU v Bratislave. In: Pohyb a zdravie – IV. ročník. Interdisciplinárna vedecká konferencia s medzinárodnou účasťou. Trenčín 2007, s. 10-17, ISBN 978-80-8075-219-4, EAN 9788080752194.

[2] Bobřík, M.: 55 rokov putovania za kalokagatickým ideálom (živé korene nášho poznania). In: Pohyb a zdravie – IV. ročník. Interdisciplinárna vedecká konferencia s medzinárodnou účasťou. Trenčín 2007, s. 1-9, ISBN 978-80-8075-219-4, EAN 9788080752194.

[3] Bobřík, M. – Benko, L.: Výsledky longitudinálneho skúmania vzťahov medzi somatometrickými ukazovateľmi a ukazovateľmi funkčnej zdatnosti študentov FCHPT STU v Bratislave v školských rokoch 2002 – 2007. Medzinárodná konferencia Sjf STU 2007, s. 35 – 39. ISBN 978-80-227-2728-0.

[4] Scholzová, A. – Bobřík, M.: Telesný rozvoj študentov a študentiek Fakulty chemickej a potravinárskej technológie STU Bratislava. Medzinárodná konferencia Sjf STU 2007, s. 142 – 145. ISBN 978-80-227-2728-0.

[5] Bobřík, M.: 55 rokov histórie KTV na STU – prameň našej neznalosti. Medzinárodná konferencia, pozvaný úvodný referát, Medzinárodná konferencia Sjf STU 2007, s. 7 – 17. ISBN 978-80-227-2728-0.

[6] Bobřík, M. – Vedralová, L. – Koláriková, A.: Vzťah medzi somatometrickými ukazovateľmi a ukazovateľmi funkčnej zdatnosti študentov FCHPT STU v Bratislave v školských rokoch 2003 – 2005. Medzinárodná konferencia Sjf STU 2007, 40 – 45. ISBN 978-80-227-2728-0.

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