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ANNUAL REPORT 1997

Bratislava 1997

Head of the Department:
Assoc. Prof. Jozef Lehotay, PhD., DSc.

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I. STAFF

Full Professors:

Dušan Bustín PhD., DSc.; Ján Garaj, PhD., DSc. (till 31.8.1996); Ján Krupčík, PhD., DSc.;
Ján Mocák, PhD., DSc.

Associate Professors:

Ernest Beinrohr, PhD.; Eva Brandšteterová, PhD.; Miroslav Čakrt, PhD.; Ján Labuda, PhD.;
Jozef Lehotay, PhD.; Eva Matisová, PhD.; Drahomír Oktavec, PhD.; Miroslav Rievaj, PhD.;
Jozef Polonský, PhD.; Viktor Vrábel, PhD.

Assistant Professors:

Eva Benická, PhD. (from 1.9.1997); Tatiana Buzinkaiová, PhD.; Tibor Hevesi PhD.; Andrea
Hercegová; Svetlana Hrouzková; Elena Korgová, PhD.; Jarmila Laštincová; Štefan Mesároš, PhD.;
Pavol Tarapčík, PhD.; Mária Vaničková, PhD.

Reader:

RNDr. Magdaléna Valachovičová

Scientific workers:

Eva Benická, PhD. (till 31.8.1998); Katarína Hroboňová (from 1.10.1997); Pavol Májek, PhD.;
Alena Manová, PhD.; Jana Sedláková, Jana Sádecká, PhD.; Ivan Skačáni, PhD.

Research workers:

Ján Dzurov

Research Fellows - PhD. Students

Roman Biely, Ľudmila Bovanová, Miriam Bučková, Adriana Ferancová, Ľubomír Jurica, Stanislav
Jursa, Jaroslav Katrlík, Pavel Kubalec, Mária Straková, Ivan Špánik, Peter Tomčík

Technical staff:

Ladislav Bartaloš, Danuša Bartalošová, Marta Benešová, Zuzana Bobáková, Elena Bruteničová,
Malvína Čakrtová, Blanka Chynoradská, Eva Lukačovičová, Magda Ondrejkočiová, Oľga
Syčová-Milá

II. TEACHING AND RESEARCH LABORATORIES

Laboratory of capillary gas chromatography

Laboratory of high performance liquid chromatography

Laboratory of electroanalytical methods

Laboratory of molecular spectrometry

Clean laboratory for trace analysis with atomic spectrometry (AAS, OES-ICP)

Laboratory of organic element analysis

Laboratory of organic synthesis

Laboratory of fluorescence analysis

Laboratory of capillary isotachopheresis

Laboratory of electrochemical pre-concentration for atomic spectroscopy

Laboratory of chemometry

III. TEACHING

4th Semester (spring)		
Analytical Chemistry I.	(2-2 h)	Garaj, Vrábel, Krupčík, Labuda
Laboratory Practice AC I.	(0-5 h)	
5th Semester (autumn)		
Analytical Chemistry II.	(2-2 h)	Bustin, Čakrt, Lehotay, Polonský
Laboratory Practice AC II.	(0-4 h)	
6th Semester (spring)		
Analytical Chemometry	(2-2 h)	Mocák
Semestral Project	(0-4 h)	
7th Semester (autumn)		
Thermodynamics	(2-1 h)	Šimon
Kinetics and Catalysis	(2-1 h)	Kovařík
Analytical Chem. Complex Mixtures	(2-0 h)	Oktavec
Analytical Chem. Complex Org. and Biol. Mixtures	(2-0 h)	Brandšteterová
Atomic Spectrometry	(2-0 h)	Beinrohr
Lab. Practice I.	(0-10 h)	
8th Semester (spring)		
Technics of separation of compounds	(2-2 h)	Matisová
Electrochemistry and Electro- analytical Chemistry	(2-1 h)	Bustin
Analytical Separation of Compounds	(2-0 h)	Krupčík
Automation of Analytical Chemistry	(2-0 h)	Rievaj
Lab. Practice of AACH	(0-2 h)	Rievaj, Dzurov
Lab. Practice II	(0-9 h)	
Semestral project	(0-4 h)	
9th Semester (autumn)		
Trace Analysis and Microanalysis	(2-1 h)	Čakrt, Beinrohr
Bioanalytical Chemistry	(2-1 h)	Mesároš
Lab. Practice V.	(0-16 h)	
10th Semester (spring)		
Seminar to Diploma Work	(0-3 h)	
Laboratory of Diploma Work	(0-27 h)	
Selected Subjects		
Analytical Chem. of Environment	(2-0 h)	Buzinkaiová
Automatization of Anal. Chem.	(2-0 h)	Rievaj
Chemistry of Solid Compounds	(2-0 h)	Garaj, Vrábel
Nuclear Analytical Chemistry	(2-0 h)	Tarapčík
Trace Analysis and Microanal.	(2-1 h)	Čakrt, Beinrohr

Inorganic Analysis of Complex Mixtures	(2-0 h)	Oktavec
Identification of compounds	(1-2 h)	Lehotay, Liptaj
Anal. Chem. of Complex Inorg. Mixtures	(2-0 h)	Oktavec
Anal. Chem. of Complex Biolog. Mixtures	(2-0 h)	Brandšteterová
For students of chemistry and evaluation of food		
8th Semester (spring)		
Identification Methods	(2-1 h)	Lehotay, Liptaj
Lab. Practice IM	(0-4 h)	
Postgraduate study		
Theoretical and Methodical Basis of Chemical Research	(2-0 h)	Bustin, Krupčík

IV. CURRENT RESEARCH PROJECTS

A. New Electroanalytical and Spectroscopic Systems for Ultra-trace and Speciation Analysis with Special Emphasis to Environmental and Clinical Problems. Optimization of Analytical Procedures (Dušan Bustin)

This research project deals with the experimental, chemometric and methodic development of analytical voltammetry emphasizing solution of ecological problems. Some topical problems of electroanalytical chemistry are concerned, namely (1) construction of microamperometric sensors using some microelectronic devices, (2) chemical and biological surface modification of amperometric sensors and (3) chemometric aspect of voltammetric (and any chemical) measurement.

1. Application of microelectronic devices in electroanalytical chemistry results in generation of new sensors with better detection limit and selectivity in comparison with electrodes of traditional sizes and shapes. Examples are MDA (microdisk array), MDAS (microdisk array embedded in the surface electrode) and IDA (interdigitated array electrode). Low value of detection limit and fast response of IDA is due to the fact that large limiting currents can be obtained with a high signal to noise ratio, due to the large amount of redox cycling between two electrodes. A considerable overlap of diffusion layers causes a large value of collection efficiency (over 90 %). Applicability of IDA in trace analysis of organic and inorganic reversible or quasi-reversible redox system is studied.

2. Chemical modification of indication electrode by specific functional groups or microstructures linked to the surface or bound in the bulk of electrode is applied in trace analysis of inorganic ions and organic species due to the high selectivity and sensitivity of determination. Complex-forming, catalytic, and biocatalytic properties of modifier as well as barrier (separation) effect of membrane film are applied. In research of chemically modified electrodes and optimization of modification procedure, following influence on the voltammetric sensor response are studied:

I. influence of modifier (its surface concentration, thermodynamics and kinetics of complex formation, modification technique),

II. influence of hydrodynamic conditions during metal accumulation and

III. influence of competing ligand in solution (type, thermodynamic stability and kinetic lability, diffusion properties).

3. Practical application and further development of chemometric procedures proceeds as follows:

I. Determination of basic characteristics of trace analysis, namely in quantitation of detection and determination limits, in point and interval calculation of concentration by means of linear and non linear calibration and standard addition methods.

II. Elaboration of theory of electrochemical measurements under "transition" conditions, filling up the gap between already theoretically defined boundary cases, e.g. transition from semiinfinite diffusion in voltammetry to the limited diffusion in a space, given by the film thickness of modified electrode.

III. Application of new materials and techniques of electrochemical/spectroelectrochemical measurement (non-traditional types of electrodes or media, geometric arrangement et cetera).

4. The next part of the project presents the effective combinations of numeric mathematics (theoretic chemistry and computer technology with efficient separation techniques (GC, HPLC, ITP), selective detection methods (AAS ETA, OES ICP, MS), sensitive electromethods and bioanalytical methods with applications in clinical chemistry (pharmacology, toxicology, therapeutical drug monitoring, veterinary medicine) and biotechnology (fermentation process monitoring and products control).

The main tasks of this part of the project:

- new procedures for the clean-up and presentation steps of biological samples (SPE, MSPD, affinity precolumn derivatization, membrane ultrafiltration ...)
- on-line SPE-HPLC for pharmacokinetics studies and monitoring drugs, their metabolites or biological active compounds (antiarrhythmics, antimycotics, antibiotics cytostatics and tumor markers...)
- the study of selected cell materials and non-physiological redox catalyst at the detection of glucose and some remedies
- development of a method for trace analysis of metals in blood using GF AAS
- determination of effects of electrode modifier properties and on electrode modification procedures on the analytical performance of electrocatalytic electrodes, modified electrodes for metal speciation and bioactive electrodes
- correlation study of chromatographic characteristics and anaesthetic properties of new drugs
- combination of achiral-chiral HPLC systems for the separation and determination of optically active biological compounds (cytostatics, antiarrhythmics).

The development of methods of high resolution gas and liquid chromatography and electrophoretic methods for the analysis of hazardous organic pollutants in environmental matrices. The study of sorption processes at pre-concentration of ultra-trace highly toxic organic pollutants from air, water and soil. Application of mathematical modelling for the optimization of relevant parameters of trace pollutants analysis by high resolution separation methods. Study of separation mechanisms in the separation of optically active compounds in environment, drugs and biological materials by combination of high efficient separation systems with chiral phases. To apply the results of theoretical chemistry (molecular mechanics, molecular dynamics, semi-empirical and "ab initio" methods), correlation of the structure of separated compounds and stationary phases with retention data for the explanation of separation mechanisms. The results of theoretical chemistry and mathematical modelling to apply for the optimization of separation of optically active compounds, particularly drugs and their metabolites.

The knowledge obtained from separation mechanisms study to apply for the separation of optical enantiomers in drugs, agrochemicals (pesticides, herbicides), toxic pollutants (PCBs), in food (flavour and fragrance components) and biological materials (Krebs cycle and amino acids).

The aim of the project can be summarised as follows:

- Preparation and characterization of new electrochemical and bioanalytical microsensors.

Analysis on of critical factors of their optimum function in determination of nitric oxide, superoxide and different chemical forms of heavy metals and biosubstrates.

- Development of new combined procedures for separation and determination of contaminants in atmosphere, water, body liquids and other biological systems as well as trace determination in technologically important materials, pharmaceuticals and other biologically active species and their metabolites.

- Development of high performance (liquid and gas) chromatographic and electrophoretic methods focused on organic contaminants in environment.

- Study of separation mechanisms in analysis of optically active species in pharmaceuticals and biological materials. Methods of theoretical chemistry as well as mathematical modeling will be used.

- Elucidation of electrochemical processes in porous electrodes for their optimal analytical applications. Calibrationless trace analysis of environmental samples by automated stripping coulometry.

- Development of flow for effective sample precontaction prior to atomic spectroscopy. An attempt to suppress the interferences and improve the detection ability.

B. New analytical systems for ultratrace and speciation analysis (Ernest Beinrohr)

A new method for the determination of As(III) and total arsenic was developed. The method is based on flow-through coulometry by making use of automized analytical system with compact flow-through electrochemical cells. The method has been used for trace analysis of water, environmental and clinical samples, especially for the determination of As in urine samples.

The utilization of electrolysis for the electrochemical generation of hydrides for atomic spectroscopy has been evaluated. It has been shown, that the conversion of Se into the corresponding hydride is almost complete in acidified sample solutions when a porous glassy carbon electrode set to a suitable potential is used.

V. COOPERATION

A. Cooperation in Slovakia:

Ministry of Environmental of Slovak Republic, Bratislava

Faculty of Pharmacy Comenius University, Bratislava

Faculty of Medicine Comenius University, Bratislava

National Institute of Oncology Slovak Republic, Bratislava

Institute of Polymers Slovak Academy of Sciences, Bratislava

Institute of Clinical and Preventive Medicine, Bratislava

Institute of Zoohygiene and veterinary technique, Trnava

Institute of Metrology Slovak Republic, Bratislava

B. International Cooperation:

Oakland University, Rochester USA

- Amperometric sensors for determination NO

Monash University, Melbourne, Australia

- New directions in electrochemical analysis - Utilization of microelectrodes

MC Gill University, Department of Oncology, Montreal, Canada

- Stereo selective separation of cancer drugs by HPLC

University of California, Cancer Hospital, San Diego, USA

- Monitoring of new anticancer drugs by HPLC

University of Münster, Institute of Pharmaceutical Chemistry, Germany

- Study of enantiomers and their metabolites at treatment of cancer

Department of Organic Chemistry, Gent University, Gent, Belgium

- Chiral separation of optical active compounds by GC

Orleans University, Laboratory of Industrial Analytical Chemistry and Chemometry, Orleans, France

- Statistical evaluation of data obtained from gas chromatographic separations of multicomponent mixtures

Department of Chemistry, University in Halle, Germany

- Evaluation shape specific properties of liquid crystals as stationary phases in gas chromatography

University DATE, Debrecen, Hungary

- On-line speciation analysis of Cr in soil

KFZ Jülich, Germany

- Ring analysis of biological reference materials

University of Leipzig, Germany

- Development chemical modified electrodes for detection in flow system

University of Bologna, Italy

- Development methods for signal processing in electrochemical methods and at Tempus project IMG-95-SQ-1025

University of Ulm, Germany

- Development of methods for trace analysis of organic pollutants in environment

University of Dortmund, Germany

- Development of equipments for flow analysis

University of Strasbourg (France), University of Tübingen (Germany), University of Regensburg (Germany), University of Eindhoven (Netherlands), University of Liege (Belgium) and Institute for chromatography in Rome (Italy)

Tempus-S-JEP-09101-95

Canada Centre for Inland Waters, Burlington, Canada

- Enantioselective study of determination PCBs after their biodegradation

University of Brno, Czech Republic and Institute for Biotechnology GmbH in Kemp, Germany

- Copernicus CIPA CT-94-0180

C. Membership in Domestic Organisations and Societies

EURACHEM Slovakia (J. Garaj, chairman)

D. Membership in International Organisations and Societies

EURACHEM (J. Garaj)

Working Party of Analytical chemistry (since 1996 Division of Analytical chemistry FECS)

UICC Geneva, Switzerland (E. Brandšteterová)

E. Tempus Programme:

1. Project TEMPUS-PHARE, No IMG-95-SQ-1025, individual mobility grant, "Application of Computers in Teaching and Examination" with co-operation Università degli studi di Bologna, Italy

2. Project TEMPUS JEP-09101-95 "New Curriculum in Chiral Chemistry", cooperation with Comenius University in Bratislava (contractor) and France (University in Strasbourg), Germany (Universities in Regensburg and Tübingen, Italy (Institute for chromatography in Roma), The Netherlands (Eindhoven University), Belgium (University in Liege)

F. International Scientific Programmes:

1. Project COPERNICUS, No. CIPA CT 94-0180 "Measuring System for Industrial On-line and in-situ Monitoring of Volatile Pollutants", with cooperation STU Bratislava, Chemolac Smolenice, Germany (Biotechnologie Kempe GmbH), Czech Republic (TU Brno).
2. Project NATO, No. Env. LG 940 637 "Enantiospecific Determination of Polychlorinated Biphenyls after their Microbial Degradation" with cooperation National Water Research Institute Burlington, Ontario, Canada.

G. Visitors from Abroad:

- Dr. A. Ivanova University of Jekaterinsburg, Russian, February 1997 (15 days)
Dr. Daraškevič Agrocentrum Minsk, Belorussian, March-April 1997 (20 days)
Prof. O.G. Phillips Wrexham Technology Park, U.K., April 1997 (4 days)
Dipl.Ing. S. Schermer University of Dortmund, Germany, study state (90 days)

H. Visits of Staff Members and Postgraduate Students in Foreign Institutions

- J. Lehotay Vienna, Austria, August 1997 (1 day)
E. Brandšteterová International Conference Chiranal '97, Olomouc, Czech Republic, January 20-23
J. Krupčík International Conference Chiranal '97, Olomouc, Czech Republic, January 20-23
E. Benická International Conference Chiranal '97, Olomouc, Czech Republic, January 20-23
E. Beinrohr International Symposium InCom '97, Düsseldorf, Germany, March 17-22
P. Tarapčík Paris, France, study state 15.5.-15.11.1997 (90 days)
J. Garaj Pardubice, Czech Republic, April 1997 (1 day)
D. Bustin Pardubice, Czech Republic, April 1997 (1 day)
I. Špánik University of Tübingen, Germany, 7.4.-31.8.97, study state (150 days)
J. Lehotay Pharmaceutical Institute, Liege, Belgium, 28.4.-30.6.1997 (60 days)
J. Dzurov International Conference, Čeladná-Podolánky, Czech Republic, April 1997 (2 days)
J. Polonský Twente, Enschede, Netherlands, April 1997 (8 days)
J. Garaj Dublin, Ireland, May 1997 (6 days)
J. Krupčík Roma, Italy, June 1997 (6 days)
E. Matisová Prague, Czech Republic, June 1997 (4 days)
E. Brandšteterová International Symposium, Vienna, Austria July 1997 (5 days)
J. Sádecká Praha, Czech Republic, July 1997 (5 days)
Š. Mesároš Pardubice, Czech Republic, Sept. 1997 (4 days)
S. Hrouzková Vienna, Austria, July 1997 (1 day)
M. Straková Vienna, Austria, July 1997 (1 day)
J. Polonský Gdaňsk, Poland, May 1997 (5 days)
J. Polonský Twente, Netherlands, June 1997 (8 days)
J. Krupčík International Conference, Siofók, Hungary, Sept. 1997 (4 days)
E. Benická International Conference, Lublin, Poland, Sept. 1997 (4 days)
J. Dzurov Bedřichov, Czech Republic, Sept. 1997 (2 days)
E. Brandšteterová 50th International Meeting, Zlín, Czech Republic, Sept. 8-11
Š. Mesároš 50th International Meeting, Zlín, Czech Republic, Sept. 8-11
P. Tomčík 50th International Meeting, Zlín, Czech Republic, Sept. 8-11
M. Bučková 50th International Meeting, Zlín, Czech Republic, Sept. 8-11
S. Hrouzková 50th International Meeting, Zlín, Czech Republic, Sept. 8-11
M. Straková 50th International Meeting, Zlín, Czech Republic, Sept. 8-11

J. Sedláková	50th International Meeting, Zlín, Czech Republic, Sept. 8-11
J. Lehotay	International Conference, Brno, Czech Republic Sept. 15-17
J. Polonský	International Conference, Toruň, Poland, Sept. 15-19
J. Sádecká	International Conference, Toruň, Poland, Sept. 15-19
A. Hercegová	International Conference, Toruň, Poland, Sept. 15-19
J. Labuda	Leipzig, Germany, study state, Oct. 1997 (60 days)
E. Benická	London, Great Britain, study state (90 days)
E. Beinrohr	International Conference, Berlin, Germany, Oct. 1997 (7 days)
M. Bučková	Hungary, Oct. 1997 (8 days)
M. Straková	Hungary, Oct. 1997 (8 days)
P. Tomčík	Hungary, Oct. 1997 (8 days)
M. Straková	Vienna, Austria, Oct. 1997 (5 days)
S. Hrouzková	Vienna, Austria, Oct. 1997 (5 days)
J. Dzurov	International Conference, Horní Lehotka, Czech Republic, Oct. 1997, 22-25
E. Beinrohr	International Conference, Horní Lehotka, Czech Republic, Oct. 1997, 22-25
P. Májek	Germany, Nov. 1997 (30 days)
E. Matisová	Germany (60 days)
J. Krupčík	Germany (60 days)
J. Lehotay	Netherlands, Nov. 1997 (2 days)
J. Mocák	Krakow, Poland, Dec. 1997 (4 days)

VI. THESIS AND DISSERTATIONS

A. Graduate Thesis (MS Degree) for state examinations after five years of study in Analytical Chemistry (Supervisors are written in brackets)

Biely R.:	Application of luminol chemiluminescence in chemical analysis of solutions (M. Čákrť)
Medved'ová M.:	Isotachophoretic determination of some antidepressants from the group of 3. generation (T. Buzinkaiová)
Jediná A.:	Study of enantioselective interactions at the gas chromatographic separation of optical active substances (J. Krupčík)
Mišičková L.:	Effective chemometric transformation of an analytical signal (J. Mocák)
Hrušková S.:	Chemiluminometric and electrochemical determination of substances of biological importance (J. Labuda)
Lefantová I.:	Modeling of separation process in multi-column systems in temperature programmed gas chromatography (T. Hevesi)
Halamová Ľ.:	Preparation and application of a chemically modified carbon paste electrode (M. Vaníčková)
Čulenová A.:	Isotachophoretic study of chosen antirheumatic drugs (J. Polonský)
Bočková I.:	Study of properties capillary column with cyclodextrine stationary phase for gas chromatography (E. Benická)
Vavrovičová Z.:	Crystal and molecular structure of some benzothiazol derivatives (V. Vrábel)
Kolembus M.:	Crystal and molecular structure of some biological active compounds (V. Vrábel)
Ferencová A.:	Achiral and chiral HPLC analysis of drugs (E. Brandšteterová)
Bovanová Ľ.:	HPLC in analysis of food samples (E. Brandšteterová)
Bočková A.:	Electroanalytical application of interdigit systems of microelectrodes (D. Bustin)
Marušíková E.:	Determination of Sn and Sb by flow coulometry (E. Beinrohr)

- Ferancová A.: Possibilities of contactless conductivity detection in capillary isotachopheresis (D. Kaniansky)
- Slezáčková M.: Utilization of SPME in combination with capillary GC for the analysis of organic pollutants in water (E. Matisová)
- Vaňková Ž.: Preparation and application of microbiosensors (Š. Mesároš)
- Horváthová V.: Trace analyses of some nitroaromatic compounds in environment by HPLC (J. Lehotay)
- Gazdíková J.: Study of some anaesthetic by HPLC (J. Lehotay)
- Vanovčan J.: Following of biogenic elements from environment in food chain (D. Oktavec)
- Teplanský M.: Determination of biogenic elements in plants of food chain (D. Oktavec)

B. Graduate Thesis (BS Degree) for state examinations after three years of study in Analytical Chemistry (Supervisors are written in brackets)

- Johanesová Z.: Study of preparation procedures before HPLC analysis of biologically active compounds (E. Brandšteterová)
- Ozábalová K.: Selective determination of the trace concentration using a modified electrode (J. Labuda)
- Mikó R.: Electrochemical detection of fluvoxamine (E. Korgová)
- Benešová A.: The separation of chiral mixtures of some drugs by HPLC (J. Lehotay)
- Orlická M.: Determination of trace metal in complex media using a chemically modified (M. Vaničková)
- Chudejová G.: Fendiline - calcium channel blocker (T. Buzinkaiová)
- Bernhauserová D.: Interaction study between macromolecules and drugs by HPLC (L. Šoltés)
- Hutárová M.: Application of biosensors in medicine and clinical biochemistry (Š. Mesároš)
- Jakubičková A.: Evaluation of properties of chiral stationary phase in gas chromatography (E. Benická)

C. Dissertations (PhD.):

- Hrouzková S.: Analysis of multicomponent samples of organic pollutants in environment. The testing of carbon sorbents for the preconcentration purposes. (E. Matisová)
- Katrlík J.: Mediator composite bio-electrodes and their utilization for food analysis. (D. Bustin)

D. Dissertations (DSc.):

- Lehotay J.: Using of HPLC in Analytical Chemistry
- Matisová E.: Analysis of complex organic systems by capillary GC and its combination with mass spectrometry and preconcentration techniques

VII. PUBLICATIONS

A. Journals (*registered in Current Contents)

- [1]* Bond A.M., Kratsis S., Mitchell S., Mocák J.: A comparison of the gold reduction and stripping processes at platinum, rhodium, iridium, gold and glassy carbon micro- and macro- disk electrodes. *Analyst* 122, 1147-1152 (1997).
- [2]* Brandšteterová E., Kubalec P., Macháčková E.: HPLC determination of trimethoprim in meat and milk with an SPE pre-separation procedure. *Z. Lebensm. Unters. Forsch.* 204, 341-344 (1997)
- [3]* Brandšteterová E., Kubalec P., Bovanová E., Bednářiková A., Macháčková E.: SPE and MSPD as pre-separation techniques for HPLC of TC in meat, milk and cheese. *Z. Lebensm. Unters. Forsch.* 205, 311-315 (1997).
- [4]* Čižmárik J., Lehotay J., Hromuláková K., Pokorná M., Lacuška M.: Study of Local Anaesthetic. Part 138. HPLC Separation of Enantiomers of Carbisocaine *Die Pharmazie* 52(5), 402-403 (1997).
- [5] Ďuračková Z., Liptáková A., Waldengus M., Labuda J.: The role of superoxide in the degradation of DNA induced by a copper(II) complex with tetraaza macrocyclic ligand. In: *Progress in Coordination and Organometallic Chemistry* (Eds.: G. Ondrejovič and A. Sirota), Slovak Techn. Univ. Press, Bratislava, 269-274 (1997).
- [6]* Hevesi T., Krupčík J.: Flow of the carrier gas in open-tubular capillary columns in temperature-programmed gas chromatography. *J. High Resol. Chromatogr.* 20, 442-446 (1997).
- [7]* Jantová S., Labuda J., Volek V., Zastková M.: Antimicrobial Effects of the Macrocyclic Cu(II) tetraanhydro aminobenzaldehyde Complex. *Folia Microbiologica* 42, 324-326 (1997).
- [8]* Kazimírová M., Slovák M., Manová A.: Host-parasitoid relationship of *Ceratitis capitata* (Diptera: Tephritidae) and *Coptera occidentalis* (Hymenoptera: Proctotrupoidea: Diapriidae) under host heavy metal stress. *Eur. J. Entomol.* 94, 409-420 (1997)
- [9]* Krupčík J., Greňa M., Špánik I., Benická E., Hrouzek J., Skačáni I. Sandra P.: Computerized optimization of selectivity for direct capillary gas chromatographic multicomponent separation of enantiomers. *J. Chromatogr. A* 779, 253-262 (1997).
- [10] Krupčík J., Benická E., Hrouzek J., Onuska F.I.: Determination of ECD relative response factors for HRGC quantitative trace analysis of PCB's. *Petroleum and coal* 39, 48-51 (1997).
- [11]* Kubalec P., Brandšteterová E., Bednářiková A.: Determination of oxacillin, cloxacillin and dicloxacillin in milk, meat and cheese samples using HPLC and precolumn derivatization. *Z. Lebensm. Unters. Forsch.* 205, 85-88 (1997).
- [12]* Labuda J., Hudáková M.: Hexacyanoferrate- anion exchanger- modified carbon paste electrodes. *Electroanalysis* 9, 239-242 (1997).

- [13]* Labuda J., Bučková M., Halamová L.: Sensor-analyte interaction kinetics as a metal speciation criterion. *Electroanalysis* 9, 1129-1131 (1997).
- [14]* Labuda J., Hudáková M.: The glucose sensor based on a copper complex mediated reduction of hydrogen peroxide. *Chem. Anal. (Warsaw)* 42, 435-443 (1997).
- [15]* Lehotay J., Hromuláková K.: Trace analysis in HPLC. *Chem. Anal. (Warsaw)* 42, 227 (1997).
- [16]* Lehotay J., Hromuláková K.: HPLC Determination of trace level of benzylchloride, chlorobenzene, naphthalene and biphenyl in environmental samples. *J. Liq. Chromatogr.* 20(19), 3193-3202 (1997).
- [17] Leško J., Jakubík T., Kakalíková L., Matisová E.: GC-MS analýza rezíduí fungicídu metalaxylu vo víne. GC-MS analysis of metalaxyl fungicide residues in wine (in Slovak). *Vinohrad* 2, 40-41 (1997).
- [18]* Matisová E., Kakalíková L., Leško J., Zeeuw J.: Application of porous carbon for solid-phase extraction of decarboxyimide fungicide residues from wines in combination with high-resolution capillary gas chromatography and gas chromatography-mass spectrometry. *J. Chromatogr. A* 754, 445-454 (1996).
- [19] Matisová E.: Analýza aromatických uhlíkovodíkov. Separácia a charakterizácia látok HRGC. Analysis of aromatic compounds. Separation and characterization of compounds by HRGC (in Slovak). *Ropa a uhlie (Petroleum and coal)* 39, 22-29 (1997).
- [20]* Mesároš Š., Grunfeld S., Mesárošová A., Bustin D., Malinski T.: Determination of nitric oxide saturated (stock) solution by chronoamperometry on a porphyrine microelectrode. *Anal. Chim. Acta* 339, 265-270 (1997).
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Prehľad pedagogickej činnosti Katedry analytickej chémie za rok 1997:

Letný semester 1996/1997

Meno	Č.pred	Typ	Pšt	Hod	Sk	Št	Dip	Dok
Učitelia:								
Profesori								
Prof.Ing. D. Bustin, DrSc.	1812	P1	21	2	21	7	1	1
	1812	C2	21	1				
	PGŠ ¹	P1	20	1,8	20			
	1852	SPR	1	0,8				
	1802	SPRB	1	0,8				
	1832	C4	5	3,8				
Prof.Ing. J.Garaj, DrSc.	1801	P1	100	2	100	7		
	1820	P1	21	2	21			
	1852	SPR	1	0,8				
Prof.Ing. J.Krupčík, DrSc.	1801	P1	100	2	100		1	
	1818	P1	21	2	21			
	PGŠ ²	P1	20	1,8	20			
	1852	SPR	1	0,8				
	1832	C4	5	3,8				
	1802	SPRB	1	0,8				
Prof.Ing. J. Mocák, DrSc.	1856	P1	20	2	20		1	
	1856	C2	20	2				
	1852	SPR	1	0,8				
	1802	SPRB	1	0,8				
	1832	C4	5	3,8				

Docenti

Doc.Ing. E.Beinrohr, CSc.	1852	SPR	1	0,8			1	1
	2561	C4	10	4,2				
	1832	C4	5	3,8				
	1802	SPRB	1	0,8				
	1801	P1	60	2	60			
	1801	C1	20	2				
Doc.RNDr. E. Brandšteterová, CSc.	1852	SPR	1	0,8			2	3
	1832	C4	10	7,6				
	1802	SPRB	1	0,8				

Doc.Ing. M.Čakrt, CSc.	1852	SPR	1	0,8		7	1	
	1832	C4	5	3,8				
	1802	SPRB	1	0,8				
Doc.Ing. J. Labuda, CSc.	1801	P1	100	2,0	100	7	1	1
	1815	C4	10	3,5				
	1832	C4	5	3,8				
	1852	SPR	1	0,8				
	1802	SPRB	1	0,8				
Doc.Ing. J. Lehotay, DrSc.	1849	P1	21	1,0	21	7	2	2
	1849	C2	21	0,5				
	1824	P1	15	0,5	15			
	1824	C2	15	1,0				
	1852	SPR	1	0,8				
	1832	C4	10	7,6				
	1802	SPRB	1	0,8				
Doc.Ing. E.Matisová, DrSc.	1832	C4	5	3,8			1	2
	1852	SPR	1	0,8				
	1802	SPRB	1	0,8				
Doc.RNDr. D. Oktavec, CSc.	–	–	–	–	PN			
Doc.Ing. J.Polonský, CSc.	1832	C4	5	3,8		7	1	1
	1852	SPR	1	0,8				
	1802	SPRB	1	0,8				
Doc.RNDr. M. Rievaj, CSc.	1819	P1	21	2,0	21		1	
	1852	SPR	1	0,8				
	1815	C4	5	3,5				
	1832	C4	5	3,8				
	1820	C4	10	4,0				
	1802	SPRB	1	0,8				
Doc.Ing. V.Vrábel, CSc.	1801	P1	15	2,0	15		2	
	1801	C1	35	4,0				
	1803	C3	15	4,0				
	1852	SPR	1	0,8				
	1832	C4	10	7,6				
	1802	SPRB	1	0,8				

Odborní asistenti

Ing. T.Buzinkaiová, CSc.	1803	C3	10	4,0			1	
	1801	C1	40	4,0				
	1852	SPR	1	0,8				
	1832	C4	5	3,8				
	1815	C4	5	3,5				
	1802	SPRB	1	0,8				

Ing. T.Hevesi CSc	1815	C4	5	3,5			1	
	1832	C4	5	3,8				
	1803	C3	10	4,0				
	1801	C1	20	2,0				
	1852	SPR	1	0,8				
	1802	SPRB	1	0,8				
RNDr. E. Korgová, CSc.	1803	C3	20	8,0				
	1801	C1	40	4,0				
	1802	SPRB	1	0,8				
	1852	SPR	1	0,8				
	1815	C4	5	3,5				
RNDr. J. Laštincová	1803	C3	30	12,0				
Ing. Š. Mesároš, CSc.	1815	C3	10	7,0			1	
	2561	C4	10	4,2				
	1802	SPRB	1	0,8				
	1852	SPR	1	0,8				
	1832	C4	5	3,8				
RNDr. P.Tarapčík, CSc.	1803	C3	10	4,0				
	1801	C1	40	4,0				
	1852	SPR	1	0,8				
RNDr. M.Valachovičová	1803	C3	30	12				
	1801	C1	40	4,0				
Ing. M.Vaníčková, CSc.	1802	SPRB	1	0,8			1	
	1852	SPR	1	0,8				
	1832	C4	5	3,8				
	1815	C4	10	7,0				

Asistenti

Ing. A. Hercegová	1803	C3	30	12				
Ing. S. Hrouzková	1801	C1	40	4,0				
	1803	C3	20	8,0				
	1815	C4	5	3,5				

Výskumní pracovníci

Ing. E. Benická, CSc.	1803	C3	20	8,0			1	
	1801	C1	20	2,0				
	1852	SPR	1	0,8				
	1802	SPRB	1	0,8				

	1815	C4	5	3,5				
	1832	C4	5	3,8				
Ing. J. Dzurov	1820	C4	15	6,0				
Ing. P. Májek, CSc.	1803	C3	30	12,0				
	1801	C1	40	4,0				
Ing. A. Manová, CSc.	1803	C3	20	8,0				
	1801	C1	40	4,0				
	1802	SPRB	1	0,8				
	2561	C4	10	4,2				
Ing. J. Sádecká	1803	C3	20	8,0				
	1815	C4	5	3,5				
	1801	C1	20	2,0				
Ing. J. Sedláková	1803	C3	30	12,0				
Ing. I. Skačáni, CSc.	1803	C3	30	12,0				
	1844	C4	5	2,8				

Doktorandi

Ing. M. Bučková	1803	C3	10	4,0				
Ing. K. Hroboňová	–	–	–	–	MD			
Ing. Ľ. Jurica	1803	C3	10	4,0				
Ing. P. Kubalec	1801	C1	40	4,0				
	1815	C4	5	3,5				
	1844	C4	5	2,8				
Ing. M. Straková	1803	C3	10	4,0				
Ing. I. Špánik	1803	C3	10	4,0				
Ing. P. Tomčík	1803	C3	10	4,0				

Hostujúci učitelia

Ing. T. Liptaj, CSc.	1849	P1	21	0,9	21			
	1849	C2	21	0,4				
	1844	C4	10	2,8				
	1824	P1	15	0,4	15			

	1824	C2	15	0,9				
Ing. J. Leško, CSc.	1844	C4	10	3,7	10			
	1849	P1	21	0,1				
	1849	C2	21	0,1				
	1824	P1	15	0,1				
	1824	C2	15	0,1				

Zimný semester 1997/1998

Meno	Č.pred	Typ	Pšt	Hod	Sk	Št	Dip	Dok
Učiteľia:								
Profesori								
Prof.Ing. D. Bustin, DrSc.	1804	P1	100	2,0	100			2
	1834	C4	5	1,8				
Prof.Ing. J. Krupčík DrSc.	1834	C4	5	1,8				3
	1814	C4	5	0,6				
Prof.Ing. J. Mocák, DrSc.	1806	C3	10	4,0				
	1804	C2	20	2				
	1814	C4	5	0,6				
	1834	C4	5	1,8				

Docenti

Doc.Ing. E. Beinrohr, CSc.	1816	P1	13	2	13			1
	1834	C4	10	4,6				
	1814	C4	10	3,0				
Doc.RNDr.E. Brandšteterová, CSc.	1828	P1	13	2,0	15			3
	1828	P1	21	2,0				
	1814	C4	5	0,6				
	1834	C4	10	3,6				
Doc.Ing. M. Čakrt, CSc.	1855	P1	15	2	15			1
	1834	C4	5	1,8				
	1804	P1	100	2,0				
Doc.Ing. J. Labuda, CSc.	1834	C4	5	1,8				2
	1814	C4	5	0,6				

Doc.Ing. J. Lehotay, DrSc.	1834	C4	5	1,8	50			2
	1814	C4	5	0,6				
	1804	P1	100	1,0				
Doc.Ing. E.Matisová, DrSc.	1834	C4	10	3,6				2
RNDr. D. Oktavec, CSc.	1814	C4	10	3,1	13			
	1817	P1	13	2,0				
	1817	P1	21	2,0				
	1806	C3	10	4				
Doc.Ing. J. Polonský, CSc.	1834	C4	5	1,8	50			1
	1804	P1	100	1,0				
	1814	C4	5	0,6				
Doc.RNDr. M.Rievaj CSc	1834	C4	5	1,8	13			
	1804	C1	20	2,0				
	1806	C3	20	8,0				
	2508	C4	10	3,7				
	1818	P1	13	2,0				
Doc.Ing. V.Vrábel, CSc.	1834	C4	5	1,8				
	1804	C1	20	2,0				
	1806	C3	10	4,0				

Odborní asistenti

Ing. E.Benická, CSc.	-	-	-	-	NV			
Ing. T.Buzinkaiová, CSc.	1842	P1	25	2,0	25			
	1834	C4	5	1,8				
	1806	C3	10	4,0				
	1804	C1	20	2,0				
	1814	C4	5	0,6				
	2508	C4	10	3,7				
Ing. T. Hevesi, CSc.	1834	C4	5	2,3				
	1806	C3	20	8,0				
	1804	C1	20	2,0				
RNDr. E. Korgová, CSc.	1806	C3	20	8,0				
	1804	C1	20	2,0				
	1814	C4	5	0,6				
	1834	C4	5	1,8				
RNDr. J. Laštincová	1806	C3	20	8,0				
	1804	C1	40	4,0				

Ing. Š. Mesároš, CSc.	1806	C3	10	4,0	21			
	1804	C1	20	2,0				
	1834	C4	15	6,4				
	1814	C4	5	0,6				
	1822	P1	21	2,0				
	1822	C2	21	1,0				
RNDr. P. Tarapčík, CSc.	-	-	-	-	NV			
RNDr. M. Valachovičová	1806	C3	30	12,0				
	1804	C1	20	2,0				
	1814	C4	5	2,7				
Ing. M. Vaníčková, CSc.	1804	C1	20	2,0				
	1806	C3	10	4,0				
	1814	C4	5	0,6				
	1834	C4	15	6,4				

Asistenti

Ing. A. Hercegová	1806	C3	20	8,0			
	1804	C1	20	2,0			
	1814	C4	5	2,7			
Ing. S. Hrouzková	1806	C3	20	8,0			
	2508	C4	10	3,7			
	1834	C4	5	1,8			

Výskumní pracovníci

Ing. J. Dzurov	1806	C3	20	8,0			
Ing. K. Hroboňová	1834	C4	5	2,3			
Ing. P. Májek, CSc.	1806	C3	20	8,0			
	1804	C1	40	4,0			
Ing. A. Manová CSc	1804	C1	20	2,0			
	1806	C3	10	4,0			
	2508	C4	10	3,7			
	1814	C4	5	1,5			
Dr. Ing. J. Sádecká	1806	C3	20	8,0			
	1804	C1	20	2,0			
	1834	C4	5	1,8			
Ing. J. Sedláková	1806	C3	20	8,0			

Ing. I. Skačáni, CSc.	1806 1814	C3 C4	10 15	4 4,3				
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Doktorandi

Ing. L. Bovanová	1819	C4	5	2,7				
Ing. M. Bučková	1806	C3	10	4,0				
Ing. Ľ. Jurica	1806	C3	10	4,0				
Ing. P. Kubalec	2508 1814	C4 C4	5 5	1,8 2,7				
Ing. I. Špánik	1806	C3	10	4,0				
Ing. P. Tomčík	1806 1804	C3 C1	10 20	4,0 2,0				

Externí pracovníci

Ing. M. Fišera, CSc.	1834	C4	15	4,6				
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¹ PGŠ predmet: Moderné elektroanalytické metódy

² PGŠ predmet: Moderné separačné metódy

Súhrn pedagogickej činnosti Katedry analytickej chémie a jednotlivých skupín učiteľov za rok 1997:

Pracovníci	Počet	Hod/týž	Sk	Št	Dip	Dok
Profesori	3,5	50,2	423	14	3	3,5
Docenti	10	169,0	543	28	12	11
Odb. asistenti	8,5	211,2	46	-	4	-
Asistenti	2	26,2	-	-	-	-
Výsk. pracovníci	7	159,8	-	-	1	-
Doktorandi	6,5	55,5	-	-	-	-
Hostujúci učitelia	1	9,5	46	-	-	-
Externí učitelia	0,5	4,6		-	-	-

