WORK PACKAGE	3
WP Type	3,4
Description	

REPORT OF THE WORKING VISIT TO THE UNIVERSITY OF TECHNOLOGY IN BRNO

Some important data in the existence of the Czech Republic

- Tomáš Masarik first president of Czechoslovakia, scientist, philosopher, teacher, politician and newspaperman.
- 28. 10. 1918. 1st Republic
- 1938 -1939. 2nd Republic
- 1939 -1945. ocupation by Germans
- 1945 - 1948. 3rd Republic
- 1948 - 1989. Czechoslovac Socialistic Republic
- 1992. splitting in states: Czech Republic and Slovakia (velvet revolution when democratic system took place over comunism)
- 2004. Czech Republic became member of EU, and 2007 entered into Schengen list.

Educational Tradition in the CR

Charles University, Prague 1348 (king Charles IV)

John Amos Comenius, father of modern education (book *Didactica Magna*), idea of teaching through playing.

About city of BRNO

It has got 370592 citizens, educational centre (1 state education, 5 public universities, 5 private universities; total number of students more than 75000)

Masaryk University (1919) - 9 faculties, 30 000 students

Brno University of Technology (1899) - 8 faculties, 24 000 students

Mendel University of Agriculture and Forestry (1919) - 4 faculties, 8000 students

University of Veterinary and Pharmaceutical Sciences (1918) - 3 faculties, over 2000 students

Janáček Academy of Music and Performing Arts (1947) - 2 faculties, over 500 students

University of State Defence (2004) - 3 faculties

There are five private Universities.

Brno University of Technology established in 1911, it has got 4 faculties: Civil engineering, Mechanical and Electrical engineering, Cultural engineering, Chemical engineering. 1951: Splitting into Military Technical Academy and Brno University of Technology

BUT Today:

8 faculties, 2 institutes
Faculty of Architecture - FA
Faculty of Electrical Engineering and Communication - FEEC
Faculty of Chemistry - FCH
Faculty of Information Technology - FIT
Faculty of Business and Management - FBM
Faculty of Civil Engineering - FCE
Faculty of Mechanical Engineering - FME
Faculty of Fine Arts - FFA
Institute of Forensic Engineering - IFE
Centre of Sports Activities - CESA

World university ranking:

BUT is among the 400 to 600 best universities of the world
(Quacquarelli Symonds Limited (QS) prestigious world university rankings)

Faculty of Chemistry, BUT

Established in 1911 as part of the Technical University
In 1951 became a part of the MilitaryTechnical University
- The end of chemical education for non-military students
In 1992/93 re-establishment of the Faculty of Chemistry at the Brno University of Technology

Faculty of Chemistry today:

1 000 students
5 institutes:
Institute of Chemistry and Technology of Environmental Protection
Institute of Materials Chemistry
Institute of Physical and Applied Chemisty
Institute of Food Science and Biotechnology
Centre for Material Research

Faculty of Chemistry (BUT) uses Meopta Company (producer of optical devices) building

Institute of Chemistry and Technology of Environmental Protection (ICTEP)

Educational activities:
BSc. Study programme Chemistry and Technology of Environmental Protection
MSc. Study programme Chemistry and Technology of Environmental Protection
Ph.D. Study programme Chemistry and Technology of Environmental Protection
BSc. Study programme Crisis management and Population Protection

Research Activities:

Fate and analysis of pollutants in the environment
Water treatment processes
Waste management and reuse
Clean air technologies, renewable sources of energy

BSC. PROGRAMME CHEMISTRY AND TECHNOLOGY OF ENVIRONMENTAL PROTECTION (6-SEMESTER, BC. THESIS)

MATHEMATICS, PHYSICS
GENERAL, INORGANIC, ORGANIC, PHYSICAL AND ANALYTICAL CHEMISTRY
ENVIRONMENTAL CHEMISTRY I
ENVIRONMENTAL ANALYTICAL METHODS
CHEMICAL ENGINEERING
CHEMISTRY AND TECHNOLOGY OF ENVIRONMENTAL PROTECTION
MOSTLY COMPULSORY SUBJECTS, SEVERAL OPTIONAL SUBJECTS

MSC. PROGRAMME CHEMISTRY AND TECHNOLOGY OF ENVIRONMENTAL PROTECTION (4-SEMESTER, DIPLOMA-THESIS)

INSTRUMENTAL AND STRUCTURAL ANALYSIS
TECHNOLOGY OF WATER TREATMENT
TOXICOLOGY, ECOTOXICOLOGY
ENVIRONMENTAL CHEMISTRY II
WASTE MANAGEMENT

MORE OPTIONAL SUBJECTS SELECTED BY STUDENT
OPTIONAL SUBJECTS IN MASTER PROGRAMME:

AUTOMATION OF TECHNOLOGIES
BIOCHEMISTRY II
DETECTION AND MEASUREMENT OF IONIZING RADIATION
PHYSICS III
MASS SPECTROMETRY
LABORATORY CLASSES IN IONIZING RADIATION DETECTION AND MEASUREMENT
LABORATORY CLASSES IN SPECIAL TOXICOLOGY
PROJECT MANAGEMENT
RADIOECOLOGY
SPECIAL DRINKING WATER TREATMENT TECHNOLOGIES
INDUSTRIAL, MUNICIPAL AND LANDSCAPE WATER MANAGEMENT

ICTEP STAFF:

3 FULL PROFESSORS
3 ASSOCIATED PROFESSORS
8 ASSISTANT PROFESSORS
1 LECTURER
4 ASSISTANT CHEMISTS
1 OFFICE LADY
46 PH.D. STUDENTS (25 IN REGULAR FORM, 21 IN COMBINED FORM OF STUDY)

LABORATORIES AND EQUPMENT AT ICEP

PREPARATIVE HPLC/GPC (High Performance Liquid Chromatography/Gel Permeation Chromatography Agilent Technologies)

GC/2X μ-ECD (Gas Chromatograph) Agilent Technologies

HPLC/DAD, FLD, RI (High Performance Liquid Chromatography/Diode Array Detector, Fluorescence Detector, Refractive Index Detector) Agilent Technologies

Pressurised Solvent Extraction (100 bar)

HPLC (SHODEX RI HPLC DETECTOR: RI-101) with waters autosampler from Shodex 717m autosampler for MSc and PhD students research

LABORATORY FOR ORGANIC CHEMISTRY (BSc Students)

Spectrophotometer for complex compounds analysis (UV/VIS 500 Spectrophotometer by Spectronic Unicam)

SAMPLE PREPARATION FOR ATOMIC SPECTROSCOPY (Multiwave 3000 SOLV by Anton Paar)

Laboratory for water analysis (coagulation processes)

LABORATORY FOR INORGANIC CHEMISTRY

AAS (Atomic Absorption Spectrophotometer) for metal detection in various samples (AAS Zeenit 60, Spectra AA 40 and Spectra AA 30)

LABORATORY FOR MATERIALS CHEMISTRY

Fisons Instruments Trio 1000 EI & CI Mass Spectrometer

GCMS 8000 (operating under MS DOS, manually controlled)

FACULTY OF FOOD CHEMISTRY AND BIOTECHNOLOGY

Specific organoleptic analysis of food properties are done. First laboratory is equped with all needed kitchen appliances (fridge, cooker, dishwasher, aspirator) where the samples are being prepared and later being tested by organoleptic specialists in 8 separate boxes. The samples are prepared from food, drinks, teas, beers, etc.

LABORATORY FOR ELECTROPHORESIS PROPERTIES OF FRUITS

Coulochem II EL- 160 by Auto cont

LABORATORY FOR PRACTICAL EDUCATION IN BIOENGINEERING

BIOSTAT B by Biotech International

BioFlo/CelliGen 115 Fermentator /Bioreactor by Eppendorf Company

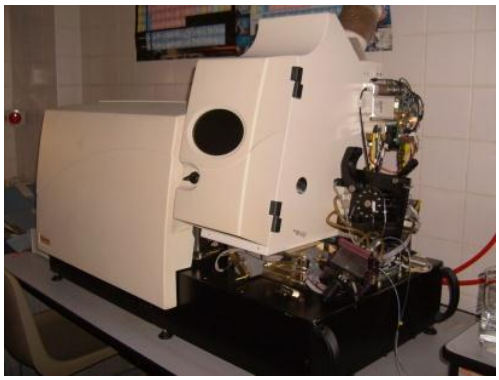
LABORATORY FOR MOLECULAR MICROBIOLOGY

GAS CHROMATOGRAPH - PYE UNICAM PU 4550 capillary chromatograph by Phillips

Analytical HPLC systems set (from left to right: HTA AS 300L, Ecom Column Oven LCO 101 horizontal, Ecom HPLC detector)

Spectrophotometer for DNA analysis (DNA Engine Peltier Thermal Cycler from BioRad)

ICPMS for detecting elements in soils



INSTITUTE OF PHYSICAL AND APPLIED CHEMISTRY

BSc

- general courses, maths, physics, physical chemistry...
- consumer's chemistry (study field)

MSc

- consumer's chemistry (study programme)

PhD

- physical chemistry
- materials chemistry

RESEARCH

- *Biocolloids* (agriculture, environment, hyaluronan, nanomedicine, cosmetics, lignite and humid supstances)
- *Molecular and organic electronics* (organic materials for electronics, optical and electronic properties, sollar cells, photovoltaic and biosensors)
- *Photochemistry* (photochemical and photocatalytical processes and photocatalytical preparation)
- *Plasmachemistry* (preparation and characterization of low-temperature plasma, surface treatment, archaeology, pollutants decomposition)

FACILITIES

Plasma reactors, spectroscopy, fluorescence spectroscopy, thermal analysis, humic laboratory, photochemistry laboratory(rheology, tensiometry, photophysics).

NEW

Centre for Materials Research, Transport System and Sensors

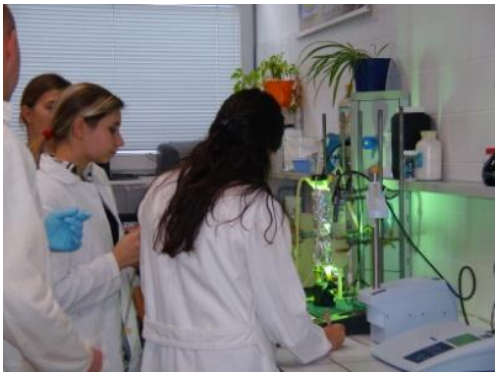
LABORATORY FOR FLUORESCENT SPECTROSCOPY

Modular Spectar Fluorometer
(FluoroLog from HORIBA Scientific)

Density and Sound Velocity Meter
DSA 5000 M from Anton Paar)

LABORATORY FOR PHOTOCHEMISTRY

Photocatalysis of TiO_2, thin layer deposition in the alloying process, sensors, photocells, fading of dyes and other printing maters.



LABORATORY FOR THERMAL ANALYSIS

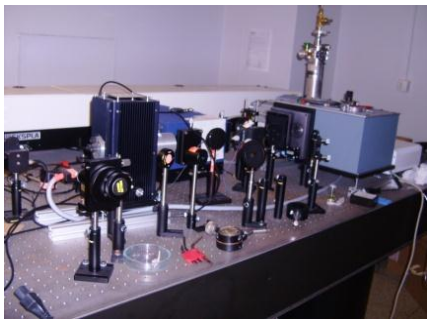
Differential Scanning Calorimeter DSC 60 from Shimadzu

LABORATORY FOR APPLICATION ANALYSIS OF CHEMICAL SUPSTANCES

In this laboratory samples are crushed and prepared in the gel form and their diffusion coefficients are characterised. IKA Werk Electronic Overhead Stirrer RW 16

LABORATORY FOR PLASMA CHEMISTRY

Equpment for using plasma for reconstruction and conservation of archaeological artefacts. According to that, Institute collaborates with Technical Museum in Brno.

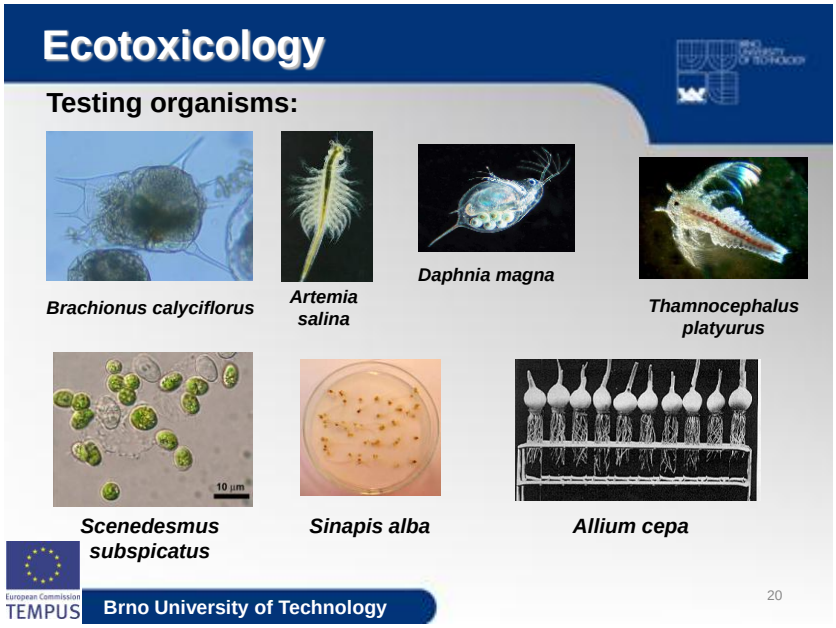

LABORATORY FOR ELECTRONIC CHARACTERIZATION

Electroluminiscence of samples is analysed, impedance spectroscopy, relaxation processes in the materials mobility of charges in materials/electronic components. measuring resistance in materials.

(Taking photos was not allowed).

ECOTOXICOLOGY

During staying at FCH we were introduced in topics of Ecotoxicology. Ecotoxicology is a multidisciplinary field, which integrates toxicology and ecology. It deals potentially harmful effects on organisms. Ecotoxicology serves to monitor effect of toxic substances in environment and helps to develop methods to predict effects of substances on environment.



VISIT TO THE INSTITUTE OF MATERIALS CHEMISTRY

Polymer group activities are: syntheses, biomaterials, composites, nano composites, testing, modeling, processing.

The Institute of materials chemistry offer in polymers:

- contract research (development of new polymeric materials, modification of polymer properties and behaviour, assessment of polymer applicability and service life-time)
- technical services (troubleshooting in polimer processing, independt assessment of material failures and complaints, properties assessment and quality checks)
- educational services (specialized corporate staff training in polymer processing, testing, degradation, stabilization)

LABORATORY FOR THERMOMECHANICAL CHARACTERIZATION OF POLYMERS POLYMER SAMPLES PREPARATION

This laboratory includes equipment for tensile strength measurements, deformation resistance, cutters, DTA and DSC (taking photos was not allowed).

SOCIAL COMPONENT OF THE MEETING IN BRNO:

November, 2011.

Report prepared by MSc Vesna Marjanović