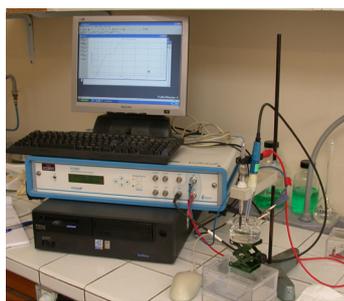
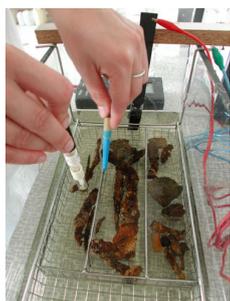


WORKSHOP ON ELECTROCHEMICAL TECHNIQUES IN CONSERVATION OF METAL OBJECTS: PRINCIPLES AND APPLICATIONS

13–15 September 2011 / The Faculty of Science of the Masaryk University in Brno



DESCRIPTION

The workshop is addressed to conservators and scientists interested in the application of electrochemical techniques to the conservation of cultural objects. The aim of the workshop is to give an overall view of the employed methods used in conservation as well as the main principles in electrochemistry and their application to specific problems. The workshop will include five modules, with theoretical and practical parts, each of them closed by a discussion and a summary. Considering thermodynamic and kinetic principles, potential and currents concepts will be presented and practical applications proposed to facilitate their comprehension. Then, a reminder of the basis of electrochemistry, of metal corrosion and the cases mostly encountered in most conservation will be presented, as well as the basis to calculate the speed of corrosion and to understand publication in the field. Finally, two types of applications will be presented:

- method of analysis for the identification of the metallic material
- and method of treatment by reduction, stabilization and transformation of corrosion products (cleaning of silver, lead, stabilisation of iron and copper alloys). Various case studies will be proposed and processed by the participants.

Organizers: Methodical Centre of Conservation of the Technical Museum in Brno, The Laboratory of Conservation of the Institute of Archaeology of the Academy of Science of the Czech Republic, Prague, v.v.i. and the Faculty of Science of the Masaryk University in Brno – the Study of the Chemistry in Conservation-Restoration.

Co-organizer: Working Group of Metals of the Committee of Conservators-Restorers of the Association of Museums and Galleries of the Czech Republic

The workshop is given by Prof. Dr. Virginia Costa, lecturer at the Institut National du Patrimoine (INP), France and free lance scientist associated to the Laboratoire des Monuments Historiques (LRMH), Conservare, Laboratoire de Recherche et Restauration du Musée de la Musique, France. Prof. Dr. Virginia Costa is specialized in the research on conservation of metallic alloys, sculpture reinforcement and roofing patina, silver artifacts, optimization and application of electrochemical techniques for the treatment of metallic artifacts; evaluation of environmental pollutants using metallic sensors, surface finishing of lead sculptures; metallographic examination of metallic threads, characterization of metal alloys using electrochemical methods and cleaning of daguerreotypes.

The workshop will be in English.

PROGRAM

1. Principles in electrochemistry: thermodynamics

Energy-mass; electrochemical / galvanic series; electrode potential and corrosion; Pourbaix's diagrams E/pH.

2. Principles in electrochemistry: kinetics

Cathodic and anodic reactions, Faraday's law; Polarization: three-electrodes cell; mixed potentials theory (Evans).

3. Corrosion

Electrochemical reactions; galvanic series / factors of corrossions; type of corrosion / evaluation.

4. Application: analysis

Identification and quantification of corrosion products on the surface.

5. Application: treatment

Choice of operational conditions (electrolyte, potential, etc.)

Case study (composite, pattern welding, jewellery, archaeological artefacts)

OBJECTIVES

At the end of the training participants should be able to:

- understand the basic principles of electrochemistry and used tools .
- evaluate results provided by laboratories; understand scientific articles.
- adapt themselves the conditions needed to obtain the expected result.
- be able to achieve electrolysis treatments by themselves.

PLANNING

Date	Module	Classroom	Laboratory
13/9	1+2+3+4	Principles of Corrosion Electrochemistry, application in analysis	Potential measurement Polarization curves, Corrosion rate, identification of metals
14/9	5	Application in treatment	Cleaning of silver and lead
15/9	4+5	Application in analysis and treatment	Stabilization of cooper alloys and iron Treatment: galvanostatic, potentiostatic and localized

PARTICIPANTS

The course is limited to 10 participants. Target audience - archaeological and historic objects conservators, conservators-scientist. Participants will receive a certificate related to the achievement of the workshop.



REGISTRATION

Candidates can send a curriculum vitae and a motivation letter for evaluation and approval **to both contact e-mail addresses until 30th April 2011**. Candidates will be informed of the acceptance of their candidature by 31th May 2011.

Motivation letter written in English should include following information:

Candidates name, name and address of employer, contact address; relevance to the work, examples of past projects, further application of the knowledge gained during the course.

The course fee: 550 CZK. The course fee includes all equipment and material needed during the course.

Travel expenses and accommodation are supported by the participants.

DATES AND VENUE

Period: 13–15 September 2011

The Faculty of Science of the Masaryk University in Brno

The Department of Chemistry
Univerzitní Kampus Bohunice
Areál Kamenice 5, budova A12
www.ukb.muni.cz



CONTACT ADDRESSES

The Methodical Conservation Centre of the Technical Museum in Brno

Purkyňova 105, 612 00 Brno
selucka@technicalmuseum.cz
tel.: ++420 541 421 407, 541 421 452



The Laboratory of Conservation of the Institute of Archaeology of CAS Prague, v.v.i.

Letenská 4, 118 01 Prague 1
ottenwelter@arup.cas.cz
tel.: ++420 266 009 291



ARCHEOLOGICKÝ ÚSTAV AV ČR, PRAHA, v.v.i.