
Environmental Geochemistry Group

"We are looking for cooperation with academic partners as well as public and private organizations in the fields of geosciences relating to the actual environmental problems."

Offer

We can offer our experience, knowledge and advanced analytical technique to suggest solutions to current problems in actual environmental geochemistry.

- Improvement of analytical techniques in geosciences, testing certified reference materials (CRMs)
- Understanding the mechanisms of release of metals and metalloids from waste materials from mining and smelting
- Suggestions of possible remediation of contaminated environment
- Application of Raman spectrometry techniques in organic geochemistry

Know-how & Technologies

By means of environmental geosciences, environmental and organic geochemistry we aim to obtain better knowledge of the biogeochemical processes in the Earth's environments, therefore we study:

- Biogeochemical cycles
- Waste materials from mining and smelting operations
- Exobiology and organics in the environment
- Analysis of geomaterials

Content of Research

- How chemical elements are cycled in the environment
- How the environment can be affected by the disposal of mining and smelting waste
- What is the behaviour of organic compounds in the environmental compartments

Main Capabilities

Focus on all kinds of surface processes related to the biogeochemical cycling of elements (especially on metals and metalloids released from anthropogenic sources), interactions between environmental compartments (soil, water, atmosphere, waste materials).

Key Research Equipment

ICP techniques: ICP MS, LA ICP MS, ICP OES

Other instrumental equipment: FAAS, Eltra CS 530 TS, TC and CS 500 TIC, AMA 254 Hg analyser, HPLC, ED XRF, Raman microspectrometry, XRD, EDS SEM

Partners and Collaborations

Academic Partners

Czech University of Life Sciences Prague, Czech Geological Survey | BRGM (French Geological Survey) Orléans | University of Bradford | Institute of Geology, The Academy of Sciences of the Czech Republic | Institute of Inorganic Chemistry, The Academy of Sciences of the Czech Republic | Reference Material Project – USGS, Denver | International Association of Geoanalysts – G-Probe programme | Institute of Geosciences, Friedrich-Schiller University, Jena

Private and Public Sector

Asekol – Urban mining (Precious metals and REE determination) | Enviropol – Recycling of WEEE (Development of determination techniques)

Main Projects

- **Arsenic speciation in mining wastes:** case studies in systems dominated by ferric sulfo-arsenates (Czech Science Foundation) 2013–2015
- **Towards a better understanding of environmental As mineralogy under reducing conditions:** Formation of realgar and evaluation of its role in remediation (Czech Science Foundation) 2016–2018
- **Modeling the competitive adsorption of metals and As onto Fe nano-oxides:** Implication for soil remediation (Czech Science Foundation) 2015–2017
- **Reactivity of anthropogenic metal-bearing geomaterials in soils** (Czech Science Foundation) 2013–2017
- **Arsenic speciation in mining wastes:** case studies in systems dominated by ferric sulfo-arsenates (Czech Science Foundation) 2013–2015
- **Mining and processing of Cu, Pb, Zn and Co ores in Sub-Saharan Africa:** natural geochemical laboratories for investigation of pollutant behaviours (Czech Science Foundation) 2016–2018

Achievements

Regular publication of papers in international ISI-ranked journals | Testing of certified reference materials | Elucidation of the mechanism of release of metals and metalloids to the environment.

Are you interested in this expertise?

Please contact CPPT UK

Web: www.cppt.cuni.cz/

Mail: transfer@cuni.cz

Phone: +420 224 491 255

Experts and their Department

Prof. RNDr. Martin Mihaljevič, CSc.

Department of Geochemistry, Mineralogy and Mineral Resources

Web: web.natur.cuni.cz/ugmnz