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.

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.
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 environ-
  mental compartments.

MAIN CAPABILITIES

Focus on all kinds of surface processes related to the biogeoche-
chemical 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 microspect-
rometry, 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 Sci-
ences of the Czech Republic | Reference Material Project – USGS,
Denver | International Association of Geoanalysts – G-Probe pro-
gramme | 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 Founda-
- Towards a better understanding of environmental As miner-
alogy under reducing conditions: Formation of realgar and eva-
luation of its role in remediation (Czech Science Foundation)
- Modeling the competitive adsorption of metals and As onto Fe
nano-oxides: Implication for soil remediation (Czech Science
- Reactivity of anthropogenic metal-bearing geomaterials in so-
- Arsenic speciation in mining wastes – case studies in systems
dominated by ferric sulfo-arsenates (Czech Science Founda-
- 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 mecha-
nism of release of metals and metalloids to the environment.

SEE OUR WEBPAGES

web.natur.cuni.cz/ugmnz