

COURSE TITLE:

ENVIRONMENTAL ANALYTICAL TECHNIQUES 2.

COURSE DESCRIPTION:

The practical includes the application of analytical methods (introduced within the frame of the lecture) on „unknown” solid study materials (minerals, rocks or manmade materials, e.g., concrete). The students learn to study solids under the stereomicroscope, document them in drawing or photo (with scale), make a detailed and comprehensive macroscopic and microscopic description of the studied material. The students prepare a research report about their study, document the material, the applied analytical methods (analytical conditions, etc.), the results of the analysis, and compare it (wherever applicable) with scientific literature. This way they learn the basics of writing scientific papers.

In the second part, focus is laid on XRF (as a way of bulk chemical analysis), combined with X-ray powder diffraction (phase analysis), and in the last research project, scanning electron microscopy (local chemical analysis) is applied, combined with any of the previously applied analytical methods, if needed. By the end of the course, students are able to properly select and apply routine analytical methods in the study of solids, discuss and evaluate analytical results and draw proper conclusions from their research. This way, they get prepared to design their own research and write research reports, Master thesis or scientific papers.

LITERATURE:

- Földvári, M. (2011): Handbook of thermogravimetric system of minerals and its use in geological practice. Occasional paper of the Geological Institute of Hungary, Vol. 213. Geological Institute of Hungary, Budapest, 178 pp. ISBN 978-963-671-288-4.
- Papp, G., Weiszburg, T.G. (ser. ed. 2000): EMU Notes in Mineralogy, Vol. 2: D.J. Vaughan, R.A. Wogelius (ed.): Environmental Mineralogy. Eötvös Univ. Press, Budapest, pp. 1–434.
- Papp, G., Weiszburg, T. G. (ser. ed. 2004): EMU Notes in Mineralogy, Vol. 6: Beran, A., Libowitzky, E. (ed.): Spectroscopic methods in mineralogy. Eötvös Univ. Press, Budapest, pp. 1–661.
- J. Dubessy, M.-C. Caumon and F. Rull (editors, 2012): EMU Notes in Mineralogy, Vol. 12: Raman spectroscopy applied to Earth Sciences and Cultural Heritage. pp. 1-504.
- R. Jenkins, R. Snyder (1996): Introduction to X-Ray Powder Diffractometry. 432 pp. ISBN: 978-0-471-51339-1

TEACHER:

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