Analyses within the master thesis were supported by the interdisciplinary research project MSM0021622427.

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Use of X-ray fluorescence spectrometry as a non-destructive analytical method in archaeology

Vojtěch Wertich, Sven Hönig

Cooperation with geologists and petrographists brings new evidences into researches, which helps archaeologists to extend knowledge about past cultures. These information can be useful e.g. for mapping distribution and provenance of stone industries, fabrication technology or finding differences in material used to making a ceramics throughout individual cultures. That's way a determination of petrographical and geochemical composition of artifacts is a good addition for each modern archaeological research. Problem of detailed geochemical analysis (such as mass spectrometry atomic, emission spectroscopy and else) were always a price, long waiting time for results and often unfortunately destructive character of analytical method. These problems may solve an analytical method of X-ray fluorescence spectrometry (XRF), which is now available at Department of Geological Science in Brno.

XRF (X-ray fluorescence is an analytical technique which uses the interaction of X-rays with a target material to determine its elemental composition. XRF is a completely safe, non-destructive method. Another advantage is portability of handheld XRF device; it is possible to analyze samples in terrain and in depositories of museums or archaeological institutes. Compared to other analytical possibilities the XRF assays are several times cheaper and faster.

Obtained results are used for study of archaeological and historical materials in order to establish likely provenance, fabrication technology and manufacturing technique. These data can help to distinguish non-original material and to detect reproductions, transportation and its origin.