

## **XRF ANALYSIS IN ARCHAEOLOGY WITH HANDHELD ANALYZER – MEASUREMENT STRATEGIES AND DATA INTERPRETATION**

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The use of X-Ray Fluorescence Analysis in archaeometry has continued to rise. For major part it is the result of availability of small, battery operated handheld XRF analyzers with miniature x-ray tubes. Nondestructive character of XRF method combined with extreme portability of a handheld analyzer make it very attractive and useful tool for field investigations which otherwise would not be possible. While the handheld XRF analyzers work on the same physical principles as their laboratory counterparts, the requirements of portability and field operation impose certain restrictions on their design which consequently may affect their use and performance.

More often than not the analysis of object of art is only qualitative. In XRF this entails examination – typically visual – of the x-ray spectra of samples. Thus it is important for the user to be well versed in correct interpretation of such spectra. For example, when compared to laboratory systems portable analyzers are more likely to produce diffraction peaks on x-ray spectra, which can be mistaken for characteristic x-ray peaks. In this paper we will discuss this and other artifacts found on x-ray spectra and how to recognize them.

The diversity of samples and objects encountered in archaeometry is second to none. A metallic ornament, a piece of pottery, wooden furniture, leather belt, oil painting, parchment manuscript, a piece of clothing, feather adornment, small bead – all these may be subject of analysis. However, each of the objects mentioned may require individual analytical approach. For example, an XRF analysis of ink on paper will require the setup different from that used for analysis of large metallic object and still different from the one suitable for small bead. Similarly, interpretation of data obtained from glazed piece of ceramic will differ from that obtained on wooden object.

This paper attempts to address these issues by providing the users of portable XRF analyzers with practical tips and advice – illustrated with real examples - on how to select the best measurement strategy to get the most of their instrumentation.