

HANDHELD XRF FOR ARCHAEOLOGICAL STUDIES: IN-SITU ALLOY AND METAL ANALYSIS OF A PRIVATE SWORD COLLECTION

J. Feuer, T. Turner, K. Russell
Innov-X Systems, Inc. Woburn, MA USA
info@innovxsys.com

Archaeometallurgy involves the compositional analysis of archaeological and other historically and/or artistically significant metal objects. Primary metals and alloys can be identified along with their relative concentrations utilizing XRF. Handheld XRF is ideally suited for in-situ, non-destructive measurements of these valuable objects. This surface analysis can perform major, minor and trace analysis to confirm metal and alloy identification without damaging the material. Such information helps to accurately describe the bulk metal, inlay, plating and/or other coatings. The identity and/or concentration of alloys and metals helps determine the composition, origin, technology, authenticity and value of an archaeological object, and aids in optimal restoration and preservation. Trace element analysis can help in the discovery of the provenance of an object or the metals it was made of. A series of related objects can be analyzed to learn patterns of alloy and specific metal use. A private sword collection from a Salem, Massachusetts collector was characterized for metal and alloy content. The specifications of the Portable XRF used in this study, the data collection techniques, results of the compositional analysis, and a description of the collection will be discussed.