XRF ANALYSIS OF ARCHAEOLOGICAL AND HISTORICAL BRONZES

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X-ray fluorescence (XRF) analysis by portable spectrometers has long been applied to the study of archaeological and historical bronzes; although not sufficient to provide all the necessary information – the knowledge of materials and deterioration products alone often requires the use of other techniques, such as atomic spectroscopy (AAS, ICP-OES, LIBS), scanning electron microscopy (SEM-EDS), x-ray diffraction (XRD) – this technique is essential for a rapid non-destructive identification of the constituent materials with all the implications that this may have on fabrication technology, previous restorations, authenticity, etc.

This paper describes a few case studies in which the mainstay of the investigation relies on the spectrometer sensitivity, that allows for a non-destructive classification of materials based on both major and minor elements. The case studies concern investigations on: 1) chromatic effects on the Hellenistic bronze statue of the "Boxer"; 2) the practice of re-use in a group of proto-historical bronze knives from Ripatransone; 3) the pertinence to different statues in a group of bronze fragments rescued from the sea at Porticello and 4) composition-dependent corrosion in a coin hoard recently excavated in the surroundings of Rome.