

A multi-analytical approach for the characterization of cultural heritage materials: a diagnostic tool for conservation

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We use Focused Ion Beam Field Emission Scanning Electron Microscopy Energy Dispersive X-Ray Analysis Electron (FIB-FESEM-EDS), Scanning Electron Microscopy (SEM), Electron Microprobe Analysis (EMPA) and X-ray powder diffraction (XRPD) for the characterization of ancient materials of Cultural Heritage. The aim is to explore their nature and alteration/corrosion products for a better diagnosis and conservation. In particular, we here report the results of two study cases on metal and ceramic materials. FIB-FESEM-EDS, SEM and EMPA were used to investigate the distribution and the concentrations of Ag, Cu, Zn and other elements in the surface and interior of Roman coins. For ceramic materials, optical microscopy, SEM, EMPA and XRPD have been applied to potteries from different archaeological sites. Based on qualitative and quantitative data, the nature of the materials and the corrosion products were explored to gain information about raw materials, technological aspects as well as the conservation state of artifacts.