RAMAN MICRO-SPECTROSCOPIC INVESTIGATION OF CORROSION PRODUCTS ON GILDED BRONZE PATINA AND CONSERVATION TECHNIQUES

Selected four gilt-bronze statuettes have been studied after excavation from the burial environment. Soil deposits and corrosion forms were observed on the surface disfiguring the gold layer. Confocal micro-Raman spectroscopy and Portable X-ray fluorescence (pXRF) were used to identify the molecular structure and elements distribution over the statuette's surfaces. The optimum suitable laser power for this kind of samples has been investigated. The optimum laser power for historic bronze objects found to be around 1mW.Total internal reflection fluorescence (TIRF) has been utilized to recognize the surface/interface state before the conservation treatment and takes the high-resolution imaging. Chemical analyses indicated that it was made of leaded bronze. High lead content in the statuettes was reflected by lead corrosion products admixed with green chloride and carbonate salts of copper. Conservation treatment was accomplished using fine and appropriate mechanical tools to recover all the gilding remains and surface details. Finally, the protection process of statuettes was accomplished using two layers of Permalac.