

Applications of X-ray fluorescence in the research of the Chilean archaeological material culture. Case studies of the National Center for Conservation and Restoration.

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Conservation Science has emerged as a scientific discipline widely applied to the research of Cultural Heritage, which has a direct impact on the work of conservators and restorers, both in the understanding and documentation of cultural goods, as well as supporting the decisions about conservation, museography, and collection management of Cultural Heritage.

On the other hand, due to the great social relevance that defines Cultural Heritage, its study directly impacts the assessment of cultural goods by their communities and the society, leading to the necessity reconfigure the working teams towards an interdisciplinary and multifactorial form.

In the studies usually carried out at the “Centro Nacional de Conservación y Restauración - CNCR” (National Center for Conservation and Restoration), the use of portable X-ray fluorescence (p-XRF) takes on a significant value because it is a non-destructive mobile technique that allows the preliminary characterization of the material composition of cultural goods at an elementary level. In addition, it allows the direct analysis of areas of interest in objects of various formats. These aspects permitted the study of four different pigment categories commonly found in the local archaeological material.

The case studies presented correspond to the analysis of Diaguita ceramics belonging to the Semiarid North of Chile. The study's objective corresponds to the first approach to the characterization of imitative restorative interventions.

The results indicated different elemental composition behavior of the intervened ceramics, which could be associated with imitative actions, both aesthetic and morphological. Additionally, the results showed the presence of common elements for the original and the intervened areas. However, differences were observed between the intervention groups; it was impossible to differentiate them statistically. Nevertheless, it was possible to associate the presence of certain elements exclusively in the intervention groups, such as lead (Pb) and titanium (Ti). Meanwhile the absence of these elements does not necessarily indicate detection of an original pigment in the ceramic.

As a projection of the work, we expect to increase the measurements in a wider ceramic universe to perform chemometrics analyses and be able to recognize a pattern to distinguish between the different imitative actions, and finally associate elemental composition with chronology and places of intervention.