

Hand-Held X-Ray Fluorescence Spectroscopy for Pre-Diagnostic Studies in Conservation, and Limitations

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Abstract : This paper outlines interferences and analytical errors which are encountered in the qualification and quantification of archaeological and ethnographic artifacts, by means of handheld x-ray fluorescence. These shortcomings were evaluated through case studies carried out on metallic artifacts related to various periods and cultures around Anatolia. An Innov-X Delta Standard 2000 handheld x-ray fluorescence spectrometer was used to collect data from 1361 artifacts, through 6789 measurements and 70 hours' tube usage, in between 2013-2017. Spectrum processing was done by Delta Advanced PC Software. Qualitative and quantitative results screened by the device were compared with the spectrum graphs, and major discrepancies associated with physical and analytical interferences were clarified in this paper.

Keywords : hand-held x-ray fluorescence spectroscopy, art and archaeology, interferences and analytical errors, pre-diagnosis in conservation

Conference Title : ICSSA 2019 : International Conference on Spectroscopy and Spectral Analysis

Conference Location : Paris, France

Conference Dates : April 18-19, 2019