

## RESEARCHING ON DECORATION IN ARCHAEOLOGICAL POTTERY BY MICRO RAMAN SPECTROSCOPY

J.A. Tuñón-López<sup>1</sup>, D.J. Parras-Guijarro<sup>1</sup>, M. Montejo-Gámez<sup>2</sup>, A. Sánchez-Vizcaino<sup>1</sup>

*Instituto Universitario de Investigación en Arqueología Ibérica. Universidad de Jaén<sup>1</sup>*

*Facultad de Química Física y Analítica. Universidad de Jaén<sup>2</sup>*

[jtunon@ujaen.es](mailto:jtunon@ujaen.es)

Experimental Sciences and Archaeology have interacted since early twentieth century to improve the results and obtain better information from archaeological materials. From this union, a new science named Archaeometry appeared. Archaeometry is the part of the Archaeology that is in charge of physical-chemical analyses of archaeological materials. Among all the archaeometrical branches, this work is focused on the study of decorations on ceramic vessels by Raman Spectroscopy.

For the last two decades, advances of analytical technology in this knowledge field have allowed increasing the types of methodologies for studying the decorated archaeological ceramics. One of them is Micro Rama Spectroscopy. Its application on archaeological materials has been favoured due to its three main properties: it is not necessary the preparation of sample, it is not required much amount of sample and it is not a destructive analysis. Because of the variety of archaeological samples, new devices have been designed for analysing of decoration on diverse-type materials, for instance, stone, pottery, glass paste, coverings, etc.

This work presents the experimental results obtained of the analyses of a group of decorated Iberian ceramics dated between 7th and 2nd century B.C. For this task, two micro Raman spectrometers were used: a Raman microscopy (C.I.C.T. de la Universidad de Jaen) (Figure 1a) and a portable Raman spectrometer (I.U.I de Arqueología Ibérica) (Figure 1b). The kind of chosen device depended on the shape and size of the pottery.

From experimental results obtained, a group of minerals can be considered as more common in the Iberian pottery. The red decoration is due to hematite and cinnabar; the goethite is responsible for yellow colour; and white is obtained from gypsum. Three black pigments were detected depending on the date of the pottery: vegetal amorphous carbon in 7th-century-B.C. ceramics, manganese oxides in 6th-century-B.C. ceramics and magnetite in 3rd-century-B.C. ceramics.

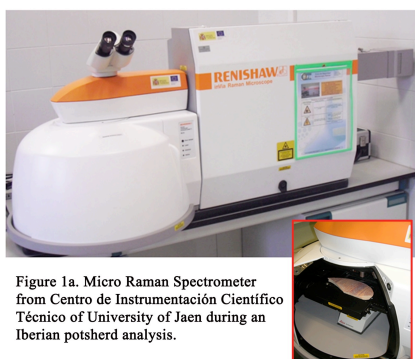


Figure 1a. Micro Raman Spectrometer from Centro de Instrumentación Científico Técnico of University of Jaen during an Iberian potsherd analysis.

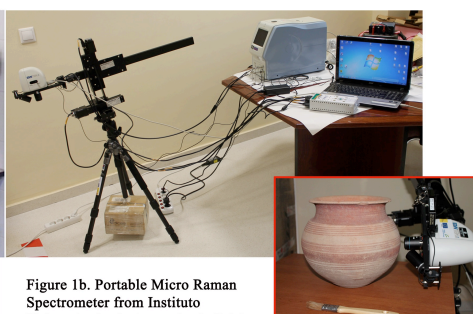


Figure 1b. Portable Micro Raman Spectrometer from Instituto Universitario de Arqueología Ibérica (University of Jaén) during an Iberian vessel analysis.