

NON-DESTRUCTIVE CHARACTERIZATION OF CAPODIMONTE AND BUEN RETIRO PORCELAIN GLAZES BY MEANS OF RAMAN SPECTROSCOPY

Paola Ricciardi¹ -- Philippe Colomban²

¹*CNR-ISTEC, Institute of Science and Technology for Ceramics, via Granarolo 64, Faenza
(Ra), Italy*

²*CNRS/UPMC-LADIR, Laboratoire Dynamique Interactions et Réactivité, 2 rue Henri
Dunant, Thiais, France*

Raman spectroscopy has long proved its effectiveness in the non-destructive characterization of pottery and porcelain pastes and glazes, as it allows a rapid and fairly straightforward identification of both crystalline and amorphous phases through the excitation of their molecular vibrational levels. The Raman spectra of silicate glasses (such as ceramics glazes) can be additionally treated in order to extract valuable information about their composition and firing temperature, which can in turn be related to the production technology of the studied artefact. Further methodological developments can be made in the structural interpretation of the spectral features of glasses, and in the establishment of definite relationships between them and the chemical composition, opacification and colouring means of the glass itself.

Raman analyses have been carried out on both transparent and opaque glazes of 18th century porcelain fragments excavated near the ancient manufactures of Capodimonte (Naples, Italy) and Buen Retiro (Madrid, Spain). The Capodimonte factory was established by Charles III of Bourbon in 1743 while he was king of Naples; when he became king of Spain, in 1759, the manufacture was dismantled and all personnel and materials moved to Madrid, where the Buen Retiro production was started.

Two instruments have been used for Raman analysis: a Dilor XY2 spectrometer in macroscopic configuration, using a 406.7 nm Kr⁺ laser and a CCD detector, and a Jobin Yvon Labram Infinity coupled with a 50x microscopic objective, Nd:YAG laser at 532 nm and CCD detector. Interesting comments can be made on the possibility of comparing spectral data acquired with different instruments.