



16th C. Portuguese tiles from the Santo António da Charneca kiln: a spectroscopic characterization of pigments, glazes and pastes

L.F. Vieira Ferreira

CQFM- Centro de Química-Física Molecular and IN-Institute of Nanoscience and Nanotechnology, Instituto Superior Técnico, Universidade de Lisboa, Av. Rovisco Pais, 1049-001 Lisboa, Portugal. lfvieiraferreira@tecnico.ulisboa.pt.

I. Ferreira Machado

CQFM- Centro de Química-Física Molecular and IN-Institute of Nanoscience and Nanotechnology, Instituto Superior Técnico, Universidade de Lisboa, Av. Rovisco Pais, 1049-001 Lisboa; Polytechnic Institute of Portalegre, P-7300-110 Portalegre, Portugal. ilferreiramachado@tecnico.ulisboa.pt.

SUMMARY: *The first archaeological evidence reported for tile production in Portugal was discovered in Santo António da Charneca, late 15th or early 16th centuries' pottery kiln, south riverside of Tagus River. Samples from this kiln were studied with the use of non-invasive spectroscopies, namely: micro-Raman, Ground State Diffuse Reflectance Absorption (GSDR), Fourier-Transform Infrared (FTIR) and X-Ray Fluorescence Emission (XRF). XRD experiments were also performed. These results were compared with the ones obtained for coeval tiles produced in Seville, Spain, originated from Portuguese archaeological sites. The mineralogical composition of pastes from tiles produced in Lisbon workshops in the first half of the 17th century was also analyzed for comparison purposes. Also clays were collected both in the North and South benches of river Tagus, as much as possible from the same clay sources as used in the initial workshops.*

(i)



(ii)



(iii)



Three tiles representative of the 16th century Portuguese faience produced at Santo António da Charneca's kiln.

The obtained results evidence a clear similarity in the clays and bodies of the ceramics of the Lisbon region, Quartz, Gehlenite and Diopside (or Augite) being the major components of the Lisbon's pastes. Clays are from Miocene origin, but differences between the ceramic pastes were detected pointing to the use of several clay sources. The spectroscopic trend exhibited at Santo António da Charneca ceramics is remarkably different, Quartz being the major component of those pastes, and clays are from Pliocene origin [1-2].

1 VIEIRA FERREIRA, L.F., D.P. Ferreira, D.S. Conceição, L.F. Santos, M.F.C. Pereira, T. M. Casimiro, I. Ferreira Machado. - *Portuguese tin-glazed earthenware from the 17th century. Part 2: a spectroscopic characterization of pigments, glazes and pastes of the three main production centres*. Spectrochim. Acta A (2015). Accepted for publication. <http://dx.doi.org/10.1016/j.saa.2015.04.090>.

2 VIEIRA FERREIRA, L.F., D.S. Conceição, D.P. Ferreira, L.F. Santos, T. M. Casimiro, I. Ferreira Machado - *Portuguese 16th century tiles from Santo António da Charneca's kiln: a spectroscopic characterization of pigments, glazes and pastes*", J Raman Spectrosc., 45 (2014) 838-847.