

Glazes of historical and contemporary ceramic artworks and their corrosion mechanisms

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The aim of this research is to study the corrosion of glazes of historical and contemporary ceramic artworks. Different types of glazes are being investigated based on the compositions found either in historical 17th century Portuguese glazed tiles and also on contemporary ceramic artworks, made using ink-jet printing technology. The results of this study will be very useful in the definition of adequate conservation methodologies.

Our research included the following tasks:

- Analysis of 17th c. Portuguese *azulejos* (glazed tiles) by EPMA, SEM and Raman, in order to determine the composition of the glazes as well as their morphological features;

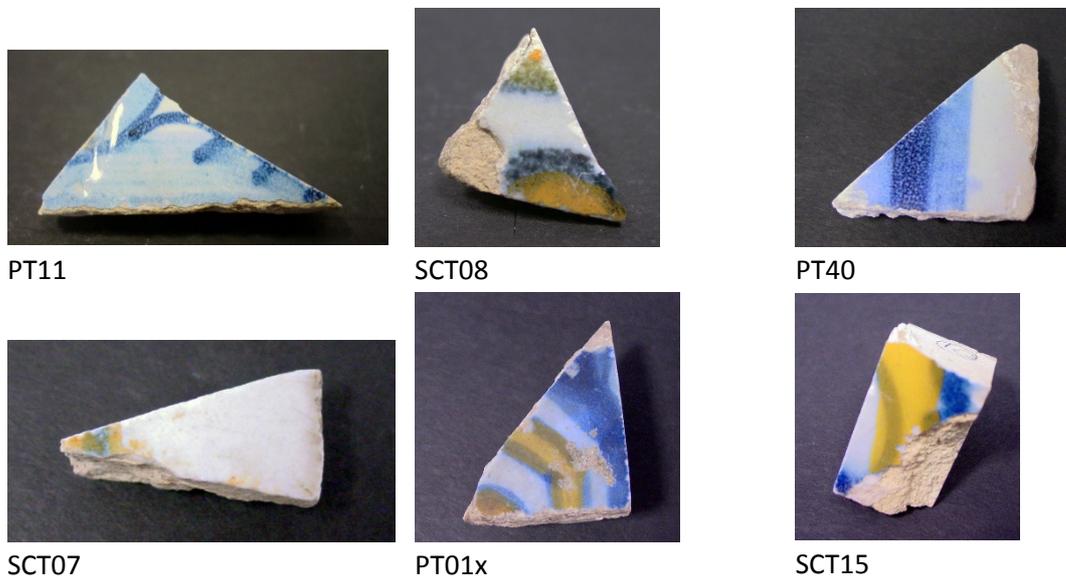


Figure 1 – Fragments from Portuguese 17th century Maiolica glazed tiles, analyzed by EPMA, SEM and Raman.

- Synthesis of a lead glass frit, to be used in the corrosion experiments, which composition is based on the average composition obtained for the historical glazes; this glass was synthesized in the *Stazione Sperimentale del Vetro*, in Murano (Venice, Italy);
- Preparation of model glass samples, from the lead glass frit, in the VICARTE facilities; for the aqueous corrosion experiments, the glass was ground and sieved and for the weathering experiments, several monoliths were prepared by remelting the frit at 1400°C;
- At present, an aqueous corrosion experiment (in distilled water at 90°C) is ongoing and solution analysis is being performed regularly by ICP-AES.
- Synthesis of a green glass, by adding copper to the lead glass frit, in VICARTE facilities; this glass replicates the green colour found in the historical glazes;
- Preparation of replicas of historical 17th century glazed tiles by ink-jet printing technology, in collaboration with KERAjet and FERRO companies. In conservation and restoration interventions

of glazed tiles, the production of replicas of historical tiles is often needed, to fill existing lacunae. In the present work, an industrial ceramic technology – inkjet printing using ceramic pigments – was investigated to make replicas of historical *majolica* Portuguese tiles. These replicas are being submitted to ageing experiments, in order to determine the weathering resistance of the contemporary glazes and pigments.



Figure 2 – Replicas of Portuguese glazed tiles, obtained using ink-jet printing technology.

Oral communication

Augusta Moniz Lima, Teresa Medici, “Seventeenth century glasses from Coimbra, Portugal: an interdisciplinary approach”, *Higher Education Course: Study days on Venetian Glass-approximately 1600’s*, Istituto Veneto di Scienza, lettere ed Arti, Venice, 27 February-1 March 2013.

International Conference “Azulejar 2012” (Augusta Moniz Lima, Ivone Braz, Leandro Pinheiro, Carlo Pantano, *Replicas of historical glazed tiles by inkjet printing*, Azulejar, Aveiro, Portugal, 10-12th October 2012).