

PHYSICO-CHEMICAL CHARACTERISATION OF METALLIC DECORATION IN ANTIQUE FURNITURE

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INTRODUCTION

The aim of our group within the University of Barcelona is the physico-chemical characterisation of cultural and artistic objects. The present study counts with the collaboration of specialists in the field of antique furniture. Furniture has always symbolized social-economic status within a culture, especially those with a more elaborate ornamentation. Within this group, a considerable quantity of furniture decorated with metallic techniques is to be found. However, few items of 18th Century furniture, similarly decorated but using an entirely different technique - an amalgam inlay known as "d'argent" (Latin Argentums) - have been located recently in the North East of Spain (Olot, Catalonia). Due to the nature of the amalgam, its degradation is considerable. Studies to date on this type of furniture are limited (MC.Corbeil. "A note on the use of tin amalgams in marquetry" Studies in Conservation 43 (1998)).

OBJECTIVE

- To document and catalogue a group of 18th Century items of "d'argent" furniture.
- To analyse the composition of the constituent materials of the metallic inlay, as well as to know its structure and the mechanism of its deterioration.
- To palliate the degradation process from the information obtained in the field of preventive conservation.

EXPERIMENTAL

The following items of furniture have been studied:
 A dressing table



A wardrobe



A pair of chest of drawers



Representative samples of the metal decoration and organic layer have been extracted with scalpel (sample measurement approximately 1 mm²), and physically studied with microscope and binocular lens. To be analysed by Scanning Electron Microscope (SEM) they have been formerly enclosed in Polyester and cut to obtain a stratigraphy. The samples for X Ray Diffraction (XRD) and Infrared Spectroscopy (FTIR) have been kept between glasses until their preparation for the analysis

RESULTS and DISCUSSION

A preliminary examination with naked eye of the metallic inlay allowed us to distinguish several typologies according to its physical appearance: matt clear (**original**), dark (**altered original**) and shiny (**restoration**).

Our research concentrates on the chest of drawers labelled A, and studies carried out on the other items of furniture are complementary. The results are the following:

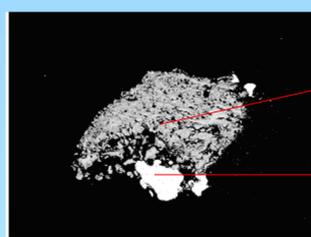
LOCALIZATION

CROSS-SECTION

BACKSCATERING

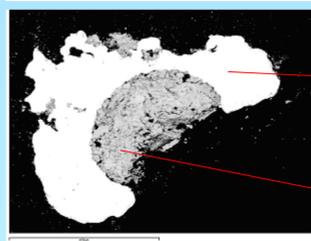
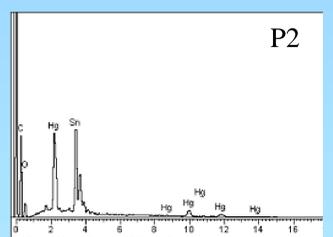
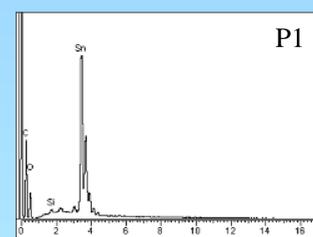
SPECTRA

CHEST OF DRAWERS A



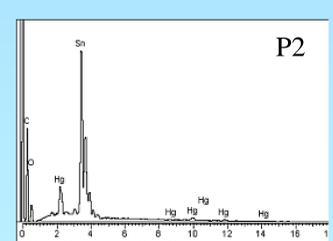
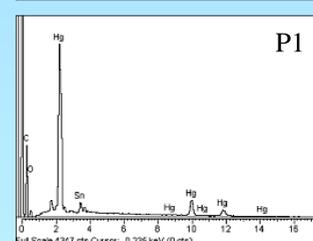
P1

P2

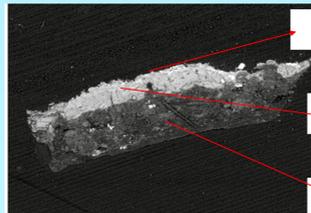


P1

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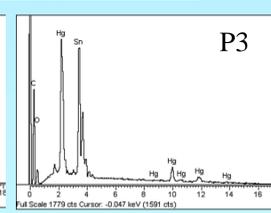
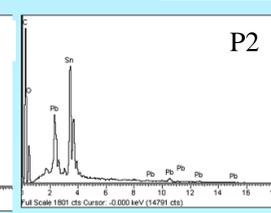
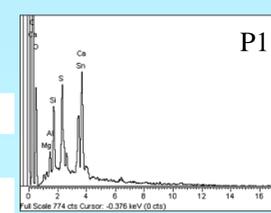
WARDROBE



P3

P2

P1



Results obtained for metallic inlay of chest of drawers A (corroborated by chest of drawers B and dressing table) show the following structure: an original amalgam of mercury and tin, often located in the core of the sample, surrounded by cassiterite (oxidization of tin), with traces of mercury. In some cases, restorations are clearly seen (shiny layer of mercury (major) and tin (minor) superposed on the inlay decoration).

Structure of **wardrobe** is more complex. It includes an intermediate layer of lead and tin together with two other layers composed, one, by an amalgam of mercury and tin and the other, by silica, aluminium, calcium and sulphur.

CONCLUSIONS

The amalgam compound inlay of each item of furniture is identical- mercury and tin-, except for the wardrobe. Despite its name, there is absolutely no presence of silver. Corrosion is evident in all items - evaporation of superficial mercury and oxidation of tin -conversion to *Cassiterite* SnO₂.

Further work is being done on reproducing, experimentally, each stage of the metallic inlay process (compound mix, thermo-ageing, oxidation) as well as on corrosion prevention. Our search for additional furniture items is on-going.

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