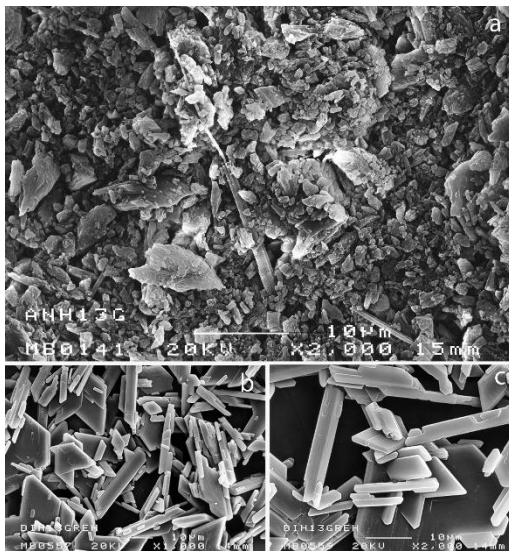


## Preparation of “yeso mate” (“gesso sottile”) for the water gilding process

### Brief description

“Yeso mate” has traditionally been considered an especially suitable material for carrying out the process of burnished water gilding. However, the materials currently marketed under the name “matte plaster” do not fully match, in most cases, in terms of morphology or composition with those obtained by traditional methods or those corresponding to real work.

In the Painting-Restoration department of the Faculty of Fine Arts at the Complutense University of Madrid, the procedure for making matte plaster described in artistic treatises, which refer to its production since the 14th century, has been recovered.



**Figure 1.** *Yeso grueso (gesso grosso) and yeso mate (gesso sottile) elaborated in the Lab[Mat] laboratory of the Faculty of Fine Arts of the Complutense University.*

*Scanning electron microscopy.*

### How does it work?

“Yeso mate” is a particularly soft gypsum with which an exceptionally soft preparation can be configured to carry out the process of burnished water gilding. This type of gilding was done on altarpieces, religious imagery, liturgical and domestic furniture and frames.

There are artistic treatises from the XIV century to the XX century that refer to its elaboration, carried out in many cases by the gilder himself. However, when studying the morphology and composition of a large number of matte plasters that are currently marketed, it has been found that they do not correspond to the type of plaster that was traditionally used. It is proposed, therefore, to recover the traditional elaboration of this material.

As starting materials can be used: gypsum stone subjected to heating and ground, plaster for molds, or white construction plaster; in all these cases it is partially or totally dehydrated gypsum (anhydrite or gypsum hemihydrate) or a mixture of these phases. The procedure is based on adding water to the starting material, while stirring the mixture, allowing the material to grow, until it no longer grows. The result is calcium sulfate dihydrate  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ , which has not hardened. Its particles remain suspended in water.

This gypsum will not set when mixed with animal glue to be applied as a preparation because it is already dihydrate. In addition, its tabular, prismatic and acicular particles form an extremely soft material, which allows the gold to achieve an exceptional luster after burnishing



## **What problem does it solve?**

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Using this method of elaboration of “yeso mate”, the quality of the materials traditionally used in the work of burnished water gilding of religious imagery and frames is recovered. The product obtained by this procedure has been compared with that observed in samples of grounds corresponding to real work (samples of altarpieces) and it has been found that they fully coincide with respect to their composition (calcium sulfate with two molecules of water) and morphology (tabular, prismatic and acicular).

## **What future products will it develop?**

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It can be used by cultural heritage restorers and gilders.

## **Competitive advantages** compared to other research

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This research was presented in several publications: Santos S., San Andrés, M., Rodríguez, A. (2000), Reproduction of traditional methods of preparing gesso grosso and gesso sottile described in old treatises. Effects on their composition and morphology, *2nd International Congress on Science and Technology for the Safeguard of Cultural Heritage in the Mediterranean basin*, Paris, Elsevier, 2000, vol.1, 813-816, Santos, S. et al. (2013), Contribution to the study of grounds for panel painting of the Spanish School (15th-16th centuries) *Studies in conservation*, 43, 115-119, as well as in the Doctoral Thesis: Santos, S. (2005), *Las preparaciones de yeso en la pintura sobre tabla de la Escuela Española* UCM. Servicio de Publicaciones Madrid 84-669-2720-4

The method of elaboration of “yeso mate” and the morphological and compositional characteristics of the material had not been previously investigated in depth, nor had a study been made a comparative study of the constitutive particles with respect to those observed in real works.

## **Where has it been developed?**

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The research team of Sonia Santos Gómez is Heritage Documentation, Conservation and Restoration Techniques, whose responsible researcher is Margarita San Andrés Moya. Its lines of research focus on:

- A) Artistic technology. Production and use of artistic materials throughout history.
- B) The industry of polymers and plastic materials. Relationship with the Conservation of Heritage Objects.
- C) Characterization techniques of artistic materials.
- D) History of Conservation and Restoration
- E) Museology and Museography. Preventive Conservation
- F) Cultural Heritage Cleaning Systems.

## **And moreover...**

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Collaboration is offered to companies engaged in the processing of materials used in the artistic field, in the conservation and restoration of works of art or in construction. In particular, to companies interested in the production of matte plaster using the traditional method.

## **Researcher in charge**

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