

The cleaning of pictorial surfaces is one of the most complex restoration processes in the field of Conservation. It is both conceptually challenging and technically rigorous. The application of different layers of coatings that serve to either protect the mural painting or to resaturate the pictorial surface, was a habitual and widespread practice that endured until only recently. In most cases, the applied materials were and remain insoluble in water. Examples of some of these substances include waxes, various synthetic polymers, or natural and synthetic varnishes among many other materials.

The major problem that arises from the use of the aforementioned products is a result of their ability to penetrate into the artwork's porous network. This penetration can severely compromise the stability of the painting's surface and renders the removal of these products from the pictorial layer tremendously complicated. Traditional cleaning methods also employ mechanical action and include the use of organic solvents. These types of interventions are potentially aggressive to fresco mural paintings. Consequently, nanostructured systems, such as micellar solutions and microemulsions, are being considered as alternatives for their removal.

The aim of this study is to analyse different cleaning agents used to eliminate hydrophobic materials from the fresco mural paintings while investigating new, efficient and non-toxic treatment options. The cleaning products selected for analysis include micellar solutions, microemulsions and emulsions without surfactants.

After the publication of some recent successful innovations made in Italy, this research aims to review the nanostructured systems available as cleaning agents for mural paintings to the conservator-restorer. It also attempts to analyse the effects of these substances while bearing in mind the constitutive differences between Italian and Spanish mural paintings, specifically in paintings from the Baroque period in the Spanish city of Valencia. To this end, an experimental framework has been established that enables the results of various tests to be analysed both on mock-up samples done *ex professo*, and *in situ* samples on mural paintings from the Valencian churches of San Nicolás and Santos Juanes.

The described experimental procedure has allowed for the observation of advantages and disadvantages inherent in nanometric systems, which will provide findings that facilitate the work of practising conservator-restorers grappling with these types of problems. This study has resulted in the development of an effective and non-toxic alternative solution that employs emulsions without surfactants. This new solution takes steps towards rectifying practical disadvantages associated with current emulsion-based cleaning systems. This line of research opens up a wide field of scientific study with broad future possibilities integral to the successful safeguarding of artistic heritage.