NAPLES, ITALY 6-10 JULY
NANOSMAT Naples
16th International Conference on Surfaces, Coatings, and Nanostructured Materials

16th International Conference on Surfaces, Coatings and Nanostructured Materials
www.nanosmat.org/special.html

ABSTRACT:

Green formulations for the cleaning of works of Art

Piero Baglioni

CSGI, Department of Chemistry, University of Florence, Florence, Italy

Works of art and artifacts that constitute our cultural heritage are subject to deterioration. Their surfaces interacting with the environment are the most prone to aging and decay; accordingly, soiling is a prime factor in the degradation of surfaces, chemical and mechanical degradation are often associated to soiling and lead to the disfigurement of a piece of art. We pioneered the synthesis and the application of several advanced systems for the consolidation and the cleaning of works of art, as hydroxides nanoparticles, microemulsions and chemical/physical gels. Most of these systems constitute a new platform for Conservation of Cultural Heritage and are characterized by scale lengths below 100 nm in one or more dimensions, making neutrons and x-rays the primary tool for the investigation and the tailoring of these systems to the final application. Scattering techniques played a major role in the development of new palette of nano-materials for the conservation, as microemulsions, physical and chemical gels, magnetic gels and microemulsion confined in responsive gels. In this talk examples from self assembled nano-systems for the cleaning or the removal of coatings from pictorial surfaces will be highlighted. Micellar solutions and microemulsions constitute very efficient systems for the removal of acrylic, vinyl and alkyd polymers or grime/soil. These systems (as well as neat solvents used in "traditional" conservation) can be confined into chemical and physical gels having proper nano-domains for the upload or the delivery of compounds from/to the work of art. For example, a fine control of the cleaning procedure can be obtained even for challenging cleanings as water sensitive works of art, where the cleaning can be achieved by using water confined into gels, leaving no residues on the works of art. Examples from conserved paintings from Picasso, Modigliani. Lichtenstein, De Chirico, Pollock will be discussed along with possible future perspectives.