

SCIENTIFIC INVESTIGATIONS AND CONSERVATION/PRESERVATION OF CULTURAL HERITAGE ARTIFACTS

Rodica-Mariana Ion^{1,2}, Ioana-Raluca Șuică-Bunghez¹, Irina Fierăscu¹, Radu-Claudiu Fierăscu¹

¹ *Research Center for Scientific Investigations and Conservation/Preservation of Industrial, Cultural and Medical Heritage, ICECHIM, 202 Splaiul Independentei, Bucharest, Romania*

² *Valahia University, Materials Engineering Dept., Târgoviște, Romania*

Nowadays, the works of art and artifacts that constitute our cultural heritage are subject to deterioration. Their surfaces interacting with the environmental pollutants are the most prone to aging and decay and soiling is a serious factor in the degradation of surfaces, chemical and mechanical degradation that can lead to the disfigurement of a piece of art. Knowledge of the chemical composition of the building materials of our monuments may help us to preserve and protect them from the pollution of our cities.

The aim of this work is to identify the materials of works of art, artifacts and buildings, as bulks, surfaces and interfaces involved in Cultural Heritage, in the main topics:

- Characterization of deterioration processes: alteration products, causes and mechanisms of material decay, accelerated ageing processes.
- Interactions between climate/environment and the supports and materials used for conservation/restoration and chemical reactions involved.
- Chromaticity in preservation and restoration of a cultural good: pigments from nature, ochres or iron oxides, and organic ones, many of them being too expensive or have completely disappeared from art.
- Photochemistry and photophysics of the ageing processes and mechanisms for different artifact objects.
- Development of new methods and materials for restoration and conservation with cultural heritage artifacts in support of their long-term preservation.
- Characterization by scientific analytical investigations based on spectroscopic and chromatographic techniques for the characterization of organic materials mostly of them being non-destructive (Research Center for Scientific Investigations and Conservation/Preservation Of Industrial, Cultural and Medical Heritage (<http://erris.gov.ro/RESEARCH-CENTER-FOR-SCIENTIF>))
- A new method based on nanomaterials (hydroxyapatite) for a conservative preservation of the treated surfaces.

The examples will involve different supports: books paper, wall stones, stuccoes, paintings, with preservative and conservative measures based on nanomaterials.

Acknowledgments: This paper received the financial support of the projects: PN 16.31.02.04.02, PNII 222/2012 and PNII 261/2014.

References

1. A.A. Sorescu, R.M. Ion, A. Nuță, I.R. Șuică-Bunghez, *Analytical investigations of some disappeared pigments from art*, Proceedings GV - Global Virtual Conference, 4(1), (2016) 168-172.
2. R. M. Ion, R. C. Fierăscu, I. Fierăscu, I. R. Bunghez, M. L. Ion, D. Caruțiu-Turcanu, S. Teodorescu, V. Rădițoiu, *Stone monuments consolidation with nanomaterials*, Key Engineering Materials, 660 (2015) 383-388.
3. R.M Ion, D. Turcanu-Carutiu, R.C. Fierascu, I. Fierascu, I.R. Bunghez, M.L. Ion, S. Teodorescu, G. Vasilevici, V. Raditoiu, *Caosite-hydroxyapatite composition as consolidating material for the chalk stone from Basarabi-Murfatlar churches ensemble*, Applied Surface Science, 358 (2015) 612–618