INNOVATIVE METHOD BASED ON NANOMATERIALS FOR CULTURAL HERITAGE CONSERVATION

Rodica-Mariana Ion, Radu-Claudiu Fierascu, Irina Fierascu, Ioana-Raluca Bunghez -ICECHIM, Romania
Daniela Turcanu-Carutiu - Ovidius University, Constanta, Romania
Mihai Opreanu - Urbanism and Architecture University "Ion Mincu", Bucharest
Aurelia Meghea, Maria Mihaly, Adina Rogozea - Polytechnica University, Bucharest, Romania
Olimpiu Blajan – S.C. ICPAO S.A., Medias, Romania

Conservation of cultural heritage, mainly based on traditional methods and conventional materials that often lack the necessary compatibility with the original artworks, needs for new and performant solution, as could nanomaterials offer. The main challenge of this paper is the use of some nanomaterials in the restoration of works of art, especially for the Rupester Ensemble from Basarabi/Murfatlar, Tibisir Hill. It is an early religious complex of primitive monasticism, dated IX-X centuries, consisting of six churches, hermitages, galleries and living places and voults, all in massive chalk. It was accidentally discovered in 1957, during the beginning of modern exploitation of the massive chalk, and now is legally declared a monument of national value. The research activity of our group has been focused on the development of manageable methodologies, based on nanomaterials with a low environmental impact. In the last years nanomaterials have been frequently applied for restoration and conservation of artworks, and the inorganic nanoparticles, proved an improved performance of materials used in this field. The experience in the synthesis and characterization of nanoparticles within PNII 222/2012 project (consortium: ICECHIM, UOC, UPB and ICPAO), combined with the experience in conservation materials in terms of durability of the conservative products, yielded to a serious research investigation on nanomaterials applied to cultural heritage. In this study, performances of nanomaterials ($Ca(OH)_2$ and Hydroxyapatite), will be comparatively presented.

Keywords: chalk stone, nanomaterials, conservation, restoration