



The use of nanomaterials in the cultural heritage

Mauro Francesco La Russa and Silvestro Antonio Ruffolo

University of Calabria, Italy

Abstract

In recent decades an apparent acceleration in the rate of stone decay and the growing worldwide interest in preserving historic structures are promoting a significant increase in the number of studies addressed to conservation and restoration. For this reason, the understanding of the mechanisms responsible for the material decay is required, as well as the optimization of the stone protection strategies. The main weathering agent is represented by water. It can transport pollutants through the structure of the stone, causing surface erosion, disintegration and cracking, thanks to wetting-drying or freezing-thawing cycles within the pores. Moreover, water make it possible the growth of biological patinas, which can induce further stone decay. In the field of Restoration of cultural heritage, nanoparticles are successfully used. In this framework, various researches funded by several National projects will be presented. In particular, the data arising from COMAS project (COservazione programmata in situ dei Manufatti Archeologici Sommersi) concerning the study of degradation and alteration phenomena in the underwater environment will be exposed. They regarded characterization and in situ experimental testing of new nanomaterials on marbles and bricks of the archaeological site of Baia (Naples, Italy). With regard to the mortars used in the underwater environment, the preliminary results of MaTACoS (Materiali e Tecnologie avanzate Applicate alla Conservazione Subacquea) project (still in progress), funded by MISE - Ministero per lo Sviluppo Economico, will be introduced. At the same time, the results of the NANOPROTECH Project, funded by the Calabria Region, concerning the testing of Titanium dioxide in different acaheological sites (foe example Trevi Fountain) will be discussed.

Biography

Mauro Francesco La Russa was born in Iacchen (ch) on september 30 1977. He took an msc in geological sciences at the university of calabria (2002) and a phd in petrography and petrology (2005-2008) at the university of catania. Researcher from december 2008 to december 2017 at the department of biology, ecology and earth sciences, university of calabria, He was associate professor at the same department. He has participated at numerous national and international congresses and workshops, frequently as a speaker, convener or invited speaker and he has been member of the organizing and scientific committee of five international summer schools. He is the scientific representative responsible for several national, european and international research projects. At present, his main research interests concern the field of cultural heritage and, in particular, the characterization of stone building materials, their decay and the experimentation of innovative protective products as well as the archaeometric study of chronologically different ceramic remains. In particular, the main topic is focused on the use of novel nanoproducts applied to cultural heritage, located both in sub aerial and in underwater environments. The research is focused on the use of titanium dioxide, m-doped titanium dioxide as biocide, as well as nanolime as consolidant.



[3rd Global Summit on Nanomaterials](#) | August 24-25, 2020

Citation: Citation: Mauro Francesco La Russa, The use of nanomaterials in the cultural heritage, Nanomaterials Congress 2020, 3rd Global Summit on Nanomaterials, August 24-25, 2020 | Webinar, 02