

USE OF SALT CRYSTALLISATION MODIFIERS TO MITIGATE THE DAMAGE BY SOLUBLE SALT TRANSPORTED BY CAPILLARY RISING WATER

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Abstract

The aim of the research is to investigate solutions for containing damages generated by soluble salt transported by capillary rising water in historical walls.

Capillary rising, extensively widespread phenomenon in historical buildings and archaeological sites, represents, even nowadays, a dangerous threat for porous stone materials. Microclimatic conditions activate wetting and drying cycles of the salt inside the porous medium generating, in a short time, its complete disintegration. Moreover, the wet condition in porous materials reduces the compressive mechanical strength, compromising the statics of buildings.

Many questions are still unsolved today, both as concerns the remedies able to inhibit the capillary rising of water, as well as the recovery of the structures. Since strategies to inhibit the capillary rising water are often invasive, and generally not usable in historical buildings, recent studies suggest that, for preventing salt crystallisation in porous materials, the use of crystallisation inhibitors and modifiers is at present the best solution. These substances were widely used to prevent or delay the unwanted nucleation of soluble salts in industrial processes and, in the last decades, they were applied in porous materials aimed at the conservation of Cultural Heritage.

The present research is aimed to give a contribution to studies related to the inhibition of damages induced to Cultural Heritage by salt crystallisation, by using experimental procedures.