NEW GREEN POLYMERS FOR APPLICATIONS IN CLEANING GRAFFITI VANDALISM ON CULTURAL HERITAGE STONES

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Introduction

Graffiti paintings, as an act of vandalism, are one of the most severe threats to stone applied in Cultural Heritage having negative social connotations but also being associated with an increasing risk of damage to architectural heritage materials [1-3]. As a matter of facts, graffiti removal procedures, despite apparently simple, are potentially harmful and irreversible inducing in most of the cases stone damage, such as chemical contamination, by-products and physical changes.

Therefore, in the selection of a graffiti removal method, together with the intrinsic characteristics of the stone several other aspects must be considered, namely the type of material used for graffiti and its chemical composition [4-6].

The most commonly used material are paint (applied by brush or aerosol), felt-tip markers, ballpoint pens, waxy substances such as crayons and lipstick, chalk, scratching, flame, posters and adhesive labels and the range of materials adopted by graffitists continues to expand [4]. Several cleaning techniques are known such as chemical methods, biological methods (bioremediation) and physical methods, which include traditional cleaning techniques such as scalpel, abrasive dust, water, blasting, sandblasting and novel cleaning techniques such as ultrasonic/megasonic agitation, plasma spray, thermal spray, dry ice blasting (CO_2-based), soda blasting, laser [1, 7-9].

In the chemical cleaning a number of solvents and paint strippers can be used, capable of dissolving or breaking down graffiti paintings [10]. Normally, such solvents should be used in a poultice form to prevent them from penetrating the substrate and permanently discolouring or staining the masonry [8-10]. Such a sequestration of solvents should be performed by using absorbent materials or powder-inert clays to form a paste or slurry with the cleaning solution or by using gel matrices [11-14].

Typical gels in cultural heritage applications are both natural compounds, like cellulose ether derivatives, and synthetic products, like the so-called "Wolbers' solvent gels" [10] or polyacrylic acid. Adjacent to these well know gels, new natural polymeric compounds, such as polysaccharide based gels (e.g. agar-agar or gellan gum), are also commonly used, in particular for water-sensitive surfaces [11-14].