

Cultural heritage artworks cleaning procedure

CSIC, in collaboration with the University of Bologna, has developed a method for the removal of calcium carbonate crystals (CaCO_3) on surface of cultural heritage artworks, by means of treatment with a light source at a specific wavelength.

Industrial partners are being sought to collaborate through a patent licence agreement.

An offer for Patent Licensing

Description of the technology

Artworks are constantly subjected to deterioration mainly due to instability of the materials, water soluble salts, humidity, temperature conditions, atmospheric pollutants and biological action. One of the most significant consequences is the unwanted formation of CaCO_3 , which precipitation, typically at very small spots in artworks, requires removal.

The removal of CaCO_3 present in artworks is usually possible through the use of solvents or solvent mixtures. They are selective cleaning methods but, often, toxics. It makes necessary to search and develop new procedures for the precise elimination of calcium carbonates present in Cultural Heritage Works avoiding, thus, their deterioration.

The present invention enables the dissolution of the crystallized CaCO_3 on the surface of the cultural heritage artworks in a precise and safe way. Thus, the cleaning procedure developed is carried out by treating the CaCO_3 crystals with a mixture of a photoacid generator and a sensitizer and subsequently irradiating them by means of a light source.



The cleaning method developed is applicable to paintings, frescoes, prints, mosaics, sculptures, monuments

Main innovations and advantages

- The procedure developed is based on the characteristic of calcium carbonate to dissolve at pH lower than 4. Thus, and by means of a controlled decrease in pH, the dissolution of the crystallized CaCO_3 on the surface of the artworks is achieved. It leads to a safe and precise artwork cleaning process.
- The irradiation of the previously treated calcium carbonate crystals is carried out by means of a continuous light source (incandescent lamp, gas discharge lamp or light emitting diode lamp).
- The use of a mixture of photoacids generator and sensitizers is a significant improvement of the nowadays existing cleaning processes because of it enables to extend the irradiation wavelength range, allowing the use of visible light (400 nm- 700 nm), and reduces the time irradiation (5 to 15 minutes).

Patent Status

European priority patent application suitable for international extension

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