An expert chemical model for determining the environmental conditions needed to prevent salt damage in porous materials

Ficha informativa

Información del proyecto

Identificador del acuerdo de subvención: ENV4950135

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Presupuesto general: € 0
Aportación de la UE: € 0

Coordinado por UNIVERSITY COLLEGE LONDON Reino Unido

Objetivo

To predict the behaviour of contaminating salts in stonework. This project will create a significant advance in the prevention of salt damage in stone, ceramics, wall paintings and other porous materials. It will provide a vital tool for all those who are charged with the conservation of European cultural heritage, informing them fully about the environmental and climatic conditions required to mitigate or prevent salt damage.

Until now, prevention of salt damage has been attempted simply by keeping the ambient relative humidity (RH) as steady as possible.
This approach can prove harmful, however, if the wrong RH is chosen. Selection of the appropriate RH is straightforward if the stone is contaminated with just one salt: one chooses an ambient RH well away from (and preferably below) the 'saturation RH' of that salt. However, this simple case is rarely encountered, and a large number of salts are usually present. These are derived, for example, from air pollution, sea-salt deposition or from the soil. The situation is then very much more complex. Salt damage occurs across a range of relative humidities, as crystallisation and phase transformations take place among the many combinations of ions that are possible. This entails the novel application of geochemical (thermodynamic) modelling techniques to predicting the behaviour of the aqueous solutions of mixed salts, and associated crystalline phases, that are encountered in stone. The thermodynamic model is linked to an expert system, which will provide the user with all the benefits of the complex science in a form which is simple and informative. It will be possible, for example, to enter the ionic analysis derived from a particular object or monument, and to receive back a statement of the environmental conditions that will prevent salt damage. It will also be possible to enter details of existing environmental conditions, and to learn the outcome of any changes that may be proposed. Many more possibilities are elaborated in the project proposal.

The results of the project will be widely disseminated, notably via the World Wide Web. The programme will be designed to run on a small personal computer, in order to make it as accessible as possible. The project involves just three partners, each of whom has worked and published in this area already. Each is vital to the success of the project, which could not be achieved without Community funding. The project will make an important contribution towards Community policy for environmental technologies that will protect the European cultural heritage.
Convocatoria de propuestas

Data not available

Régimen de financiación

CSC - Cost-sharing contracts

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