

NANOPRECORR

R+d+i

Prevention of corrosion in reinforced concrete based on nanotechnology application.

Description

The main problem of reinforced concrete is the corrosion of the embedded steel. Triggering of corrosion may be due both the carbonation of the concrete, which generally induces widespread corrosion, and penetration of chlorides from de-icing salts or marine environments, which produces pitting and localized attacks. <both types of corrosion result in destroying the passive layer. Due to this, it is extremely important to develop preventive methods to avoid the appearance of these chemical processes.

Objectives and improvements

Main objective of the project is the development of an innovative self-healing system for smart prevention of corrosion in reinforced concrete based on nanotechnology application. The approach is totally new and groundbreaking in the field of concrete technology, since there are nowadays preventive solutions (commercial inhibitors, polymeric coatings based epoxy or acrylic resins) that have an inhibiting effect very limited in time in addition to a high cost.

Results

The encapsulation technology of the inhibitors was developed and validated with laboratory tests that were performed at the Technological Institute of Construction (AIDICO) in Valencian Community.



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INNOVATION IN NEW MATERIALS:

A) NANOPRECORR: R&D project based on nanotechnology application for the prevention of corrosion produced by chloride attack in reinforced concrete in order to achieve more structures with high durability and long service life, reducing maintaining costs, especially when the infrastructure is exposed to aggressive environment such as marine environment.



Scheme 1: Inhibiting agents functioning



Image 1: Synthesis reactors for the manufacturing on inhibitors



Image 2: Test specimens

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