SELF-CLEANING COATINGS

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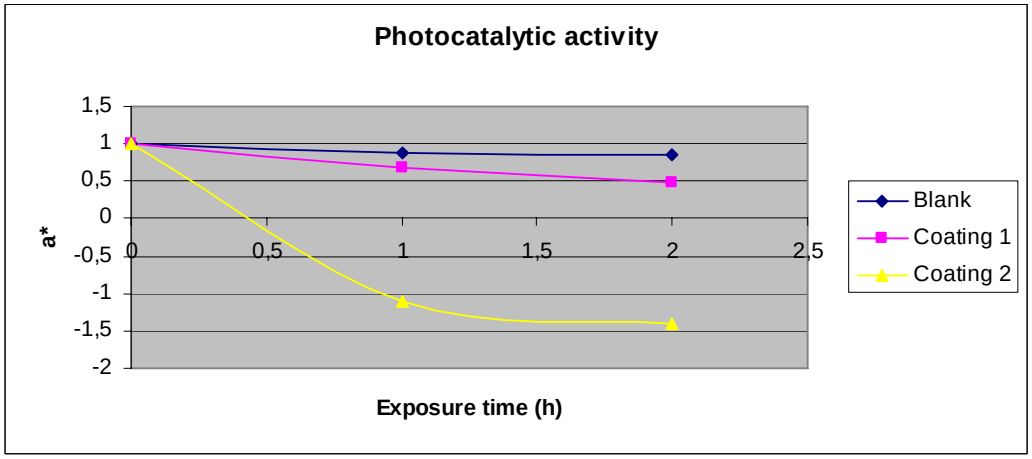
The first reports on the photocatalytic activity of titanium dioxide (TiO_2 or titania) were published by Fujishima *et al.* [1] in the 1960s. However, titania-containing coatings continue to attract much interest nowadays, particularly for the development of novel products (self-cleaning surfaces), as the substrate can benefit from the photocatalytic properties of the coating applied. Most studies have focused on glass as the substrate, but other substrates have also been reported, such as silicon whiskers, ceramics and stainless steel [2].

At LABEIN-Tecnalia, we have been investigating the development of photocatalytic coatings (using the Sol-Gel method) for applications in the construction sector. The aim of this project is to develop self-cleaning coatings for steel subtrates which could be used in buildings.

Titania-containing coatings have been obtained by many different techniques, including spray pyrolysis, magnetron sputtering, electrodeposition, chemical vapour deposition (CVD), thermal spray, etc. However, our studies have focused only on the Sol-Gel method [3].

In order to evaluate the photocatalytic activity of our coatings, an organic dye (Rhodamine B) was first applied onto each coating. Then the samples were irradiated with UV light (280-315 nm) and the disappearance of the dye was monitored by colorimetry:



Photocatalytic activity of Self-cleaning Coatings 1 and 2

References:

[1] Honda K.; Fujishima A., *Nature*, **1972**, *238*, 37
[2] Balasubramanian G.; Dionysiou D.D.; Suidan M.T., *Encyclopedia of Nanoscience and Nanotechonology*, *Marcel Dekker*, **2004**, *5*, 3917-3926
[3] Brinker C.J.; Scherer G.W. (Eds.), "*Sol-Gel Science. The Physics and Chemistry of Sol-Gel Processing*", Academic Press, San Diego (1990)