

ABSTRACT REF. 71

Development of cementitious tiles with photocatalytic surfaces

Luis Philipe Spricigo, Adriano Michael Bernardin
Ceramic Materials Group, UNESCO, Criciúma, Santa Catarina, Brazil
amb@unescc.net

Abstract:

Under incidence of ultraviolet light, titanium dioxide (TiO_2) can act as a facilitator of chemical reactions, thus acting as a catalyst. This phenomenon can be used to induce the breaking of water and hydrocarbon molecules bonds. This feature has been used in some materials to promote the self-cleaning property. From this context, this research aimed at the development of self-cleaning property on the surface of cementitious tiles. A 2^k factorial experimental design was used, where the main factors were the type of catalyst (TiO_2), content of catalyst used in solution and the number of layers of the mixture (catalyst and ink) applied onto the workpiece surface. A specific ink (FeCl_2) for cement surfaces was used as medium for the mixtures. After deposition of the mixtures, samples of cementitious tiles were kept in contact with methylene blue (3 ppm) under UV irradiation (330 nm) to 3 h in order to determine the self-cleaning power of the deposited layers. The test was performed according ISO 10678 standard. As a result, the self-cleaning characteristic developed in the cementitious surfaces is a function of the processing variables. The deposition on the sample surface of the P25 (Evonik) catalyst, with a grammage of 7 g and forming three layers showed the best results in the degradation rate and degradation kinetics of methylene blue.

Keywords: Cementitious materials. Nanotechnology. Self-cleaning. Photocatalysis. TiO_2 .