

Processing and characterisation of Calcium SulfoAluminate (CSA) eco-cements coated with a hybrid organo-inorganic material for photocatalytic applications

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Abstract

On the one hand, Calcium SulfoAluminate (CSA) eco-cements are receiving increasing attention since their manufacture produces up to 40% less CO₂ than ordinary Portland cement (OPC). In addition, they show interesting properties such as high early-age strengths, short setting times, impermeability, sulfate and chloride corrosion resistance and low alkalinity.

On the other hand, water treatment is a key issue and it will become much more important in the decades ahead. We have developed a photocatalytic material capable to degrade contaminants in water, under both UVA and visible radiations. In both cases, it works more effectively than nano-TiO₂ (Evonik P25).

The environmental benefits of the use of CSA eco-cements with a photocatalyst are two folds: the photocatalytic treatment of contaminated water, and lower CO₂ emissions because of the use of eco-cements rather than OPC. However, before preparing the coating, different parameters need to be under control. This includes the effect of the photocatalyst onto the eco-cement (setting time, phase assemblage, and so on), and the effect of the eco-cement on the photocatalyst.

This work deals with the processing and characterisation of coatings onto CSA eco-cement pastes, including rheological behaviour, setting time, phase assemblage, adhesion, and so on.

Keywords: *CSA eco-cement, processing, water treatment, photocatalysis.*

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