

The Effect of Pozzolan Addition on the Physico-Chemical and Mechanical Properties of Mortars Based on Cement Resistant to Sulfate (CRS)

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Abstract : The use of cements CRS in aggressive environments showed a lot of benefits as like good mechanical responses and therefore better durability, however, their manufacturing consume a lot of clinker, which leads to the random hazardous deposits, the shortage of natural resources and the gas and the dust emissions mainly; (CO₂) with its ecological negative impact on the environment. Technical, economic and environmental benefits by the use of blended cements have been reported and being considered as a research area of great interest. The purpose of this study is to evaluate the influence of the substitution of natural pozzolan on the physico-chemical properties of the new formulated binder and the mechanical behavior of mortar containing this binary cement. Hence, the pozzolan replacement is composed with different proportions (0%, 2.5%, 5%, 7.5% and 10%). The physico-chemical properties of cement resistant to sulfate (CRS) alternative composition were investigated. Further, the behavior of the mortars based on this binder is studied. These characteristics includes chemical composition, density and fineness, consistency, setting time, shrinkage, absorption and the mechanical response. The results obtained showed that the substitution of pozzolan at the optimal ratio of 5% has a positive effect on the resulting cement, greater specific surface area, reduced water demand, accelerating the process of hydration, a better mechanical responses and decreased absorption. Therefore, economic and ecological cement based on mineral addition like pozzolan could be possible as well as advantageous to the formulation of environmental mortars.

Keywords : Cement Resistant to Sulfate (CRS), environmental mortars mechanical response, physico-chemical properties, pozzolan

Conference Title : ICAM 2015 : International Conference on Advanced Materials

Conference Location : Jeddah, Saudi Arabia

Conference Dates : January 26-27, 2015