

Mechanical Performance of Geopolymeric Mortars Based on Natural Clay, Fly Ash and Metakaolin

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Abstract : Infrastructure rehabilitation represents a multitrillion dollar opportunity for the construction industry. Since the majority of the existent infrastructures are Portland cement concrete based this means that concrete infrastructure rehabilitation is a hot issue to be dealt with. Geopolymers are novel inorganic binders with high potential to replace Portland cement based ones. So far very few studies in the geopolymer field have addressed the rehabilitation of deteriorated concrete structures. This paper discloses results of an investigation concerning the development geopolymeric repair mortars. The mortars are based on Tunisian natural clay plus calcium hydroxide, sodium silicate and sodium hydroxide. Results show that the geopolymeric mortar has a high compressive strength and a lower unrestrained shrinkage performance as long as partial replacement by metakaolin is carried out. The results also show that Tunisian calcined clay based mortars have hydration products with typical geopolymeric phases.

Keywords : geopolymeric mortars, infrastructure repair, compressive strength, shrinkage

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