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The Properties of Fly Ash Based Geopolymer Mortars Made with Dune Sand

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ABSTRACT

This paper reports the properties of fly ash based geopolymer mortars made with dune sand. The geopolymer mortars of different cation type, namely sodium based (Na), potassium based (K) and a mixed Na/K, were prepared with Dune Sand (DS) and River Sand (RS). The corresponding geopolymer pastes were also prepared. A series of tests including compressive strength, modulus of elasticity, splitting tensile strength, microanalysis (using scanning electron microscopy), porosity (using mercury intrusion porosimetry), sorptivity and air void (using section analysis method) were carried out. The results showed a strong correlation between strength and porosity of geopolymeric materials. The addition of DS had influences on the chemical compositions and physical properties of geopolymers mortars. These influences were dependent on the type of cation. Based on the results of mechanical properties, DS can be utilised as the fine aggregate for the production of geopolymer based construction material.

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