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A Review on Properties of Fresh and Hardened Geopolymer Mortar

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Abstract: Geopolymer mortar refers to the mortar manufactured with sand and geopolymer, which is composed by the base materials containing affluent aluminium and silicon that was activated by adopting alkaline solution to serve as a binder. The investigation of the properties and application of the geopolymer mortar has attracted more and more attention of the researchers and cement based industries because of its sustainability advantages. This study reviews the properties of the geopolymer mortars including fresh performance (workability, setting time, and temperature of fresh mortar), physical properties, mechanical properties (compressive strength, tensile strength, elastic properties, flexural performance, bonding behavior, and fracture behavior), durability properties (acid resistance, resistance to elevated temperature, frost resistance, water absorption, and shrinkage properties) and microstructure analysis. This study also reviews the properties of different types of geopolymer mortars prepared using various source materials as base materials. The current study results indicate that the geopolymer mortar has exhibited significant feasibility and application prospect to be used as an environmental friendly building material, which may be an appropriate replacement to the traditional cement mortar in the future.

Keywords: Geopolymer mortar; Physical properties; Fresh properties; Mechanical properties; Durability; Microstructure

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