



A Novel Type of Alkaline Activator for Geopolymer Concrete Based on Class C Fly Ash

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ABSTRACT

In recent years, geopolymers, as a new class of green cement binders, have been considered as an environmental-friendly alternative to Ordinary Portland Cement (OPC) which can potentially reduce negative environmental impacts of OPC including: carbon footprint, energy consumption and etc. In this experimental research, effects of different alkaline activator solutions on the compressive, Tensile and flexural strengths, water absorption and resistance to acidic condition of fly-based Geopolymer Concrete (GPC) were investigated. Furthermore, a novel type of alkaline activator for GPC was introduced. In this regard, GPC specimens based on Class C fly ash were manufactured and cured in 90 °C. The obtained results showed that addition of NaOH to the mix after 3 min of mixing KOH and Na₂SiO₃ with dry components (1/3 of the total mixing duration) resulted in the highest compressive, tensile and flexural strengths as well as, the lowest water absorption capacity and weight loss under acidic condition, amongst other cases.

Keywords:

Geopolymer concrete, Fly ash, Alkaline activator, Compressive strength, Resistance to acidic condition.