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**The relationship of NaOH molarity, Na2SiO3/NaOH ratio, fly ash/alkaline activator ratio, and curing temperature to the strength of fly ash-based geopolymer**

Abstract

Geopolymer, produced by the reaction of fly ash with an alkaline activator (mixture of Na2SiO3 and NaOH solutions), is an alternative to the use of ordinary Portland cement (OPC) in the construction industry. However, there are salient parameters that affecting the compressive strength of geopolymer. In this research, the effects of various NaOH molarities, Na2SiO3/NaOH ratios, fly ash/alkaline activator, and curing temperature to the strength of geopolymer paste fly ash were studied. Tests were carried out on 50 x 50 x 50 mm cube geopolymer specimens. Compression tests were conducted on the seventh day of testing for all samples. The test results revealed that a 12 M NaOH solution produced the highest compressive strength for the geopolymer. The combination mass ratios of fly ash/alkaline activator and Na2SiO3/NaOH of 2.0 and 2.5, respectively, produced the highest compressive strength after seven days. Geopolymer samples cured at 60 °C produced compressive strength as high as 70 MPa.

Keywords; Compressive Strength, Curing Temperature, Fly Ash/Alkaline Activator Ratio, Geopolymer,Na2SiO3/NaOH Ratio, NaOH Molarity