World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Effect of Concentration of Alkaline and Curing Temperature on Compressive Strength of Geopolymer Concert

Authors : Nursah Kutuk, Sevil Cetinkaya

Abstract : Geopolymers are becoming new concrete materials to use alongside cement, which are formed due to reaction between alumino-silicates and oxides with alkaline media. Silicates obtained from natural minerals or industrial wastes are used for geopolymer synthesis. Geopolymers have recently received wide attention because of their advantages over other cementitious material like Portland cement. Some of the advantages are high compressive strength, low environmental impact, chemical and fire resistance and thermal stability. In this study, geopolymers were prepared by using inorganic materials such as kaolinite and calcite. The experiments were carried out by varying the concentration of NaOH as 5, 10, 15 and 20 M, and at cure temperature of 22, 45 and 65 °C. Compressive strengths for each mixes at each cure temperature were measured. Results of the analyses indicated that the compressive strength of geopolymers did not increase steadily with increasing concentration of NaOH, but did increase steadily with increasing cure temperature. We examined the effect Na2SiO3/NaOH weight ratio on the properties of the geopolymers, too. It was seen that Na2SiO3/NaOH weight ratio was also important to prepare geopolymers that can be applied to construction industry.

Keywords : geopolymers, compressive strength, kaolinite, calcite
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020