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Comparative Study on Strength Characteristics of Fly Ash Based Geopolymer Concrete with 8, 10 & 12 Molar Naoh Activator

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Abstract: *Ordinary Portland cement is a major construction material worldwide. Cement manufacturing industry is one of the carbon dioxides emitting sources besides deforestation and burning of fossil fuels. The global warming is caused by the emission of greenhouse gases, such as CO2, to the atmosphere. Among the greenhouse gases, CO2 contributes about 65% of global warming. The cement sector accounts for around 7% of worldwide greenhouse gas emissions of the earth's atmosphere. In order to address environmental effects associated with Portland cement, Alternative binders for concrete production are needed. Low-calcium (Class F) fly ash-based geopolymer from Vijayawada was used in this study. Geopolymer concrete was made with the help of a thermal power plant. The combination of sodium silicate solution and sodium hydroxide solution was used as alkaline solution for fly ash activation. Alkaline solution to fly ash ratio was varied as 0.45. The concentration of sodium hydroxide solution was maintained as 8M, 10M & 12M (Molars). The curing condition of geopolymer concrete was varied as ambient curing. The compressive strength, Split Tensile Strength of the geopolymer concrete was tested at various ages such as 7 and 28days. From the test results it was found that as the alkaline solution to fly ash ratio increases, the strength of geopolymer concrete also increases.*

Keywords: Geo-polymer concrete, fly ash, metakaolin & alkaline solution

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