

INFLUENCE OF ALKALINE ACTIVATORS AND TEMPERATURE ON STRENGTH PROPERTIES OF GGBS BASED GEOPOLYMER CONCRETE

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ABSTRACT

Since last few years, Concrete Technologists are putting in continuous efforts to minimize the consumption of Portland cement in concrete. Cement concrete offering architectural freedom is second highest consumed material on earth. Portland cement production is one of the major causes of CO₂ emission in atmosphere. With limited natural resources and durability issues, a need is felt to lessen or curtail the use of cement in concrete and replace the same with immensely available industrial by-products. Partial replacement of Portland cement has been successful but research is still going on for its complete replacement by materials that are rich in Silica and Alumina. These materials, when activated by an alkaline solution exhibit similar strength and durability properties of that of conventional cement concrete. Present study emphasizes on studying potential application of GGBS, in presence of Sodium based alkaline activators, for developing Geopolymer concrete. Compressive strength development up to 90 days is studied for different molarities (2M-8M) of NaOH solution and varying temperature conditions (ambient and oven). Split tensile strength tests were done on cylinders on 28th day of casting. From this study it is revealed that with the similarity in structural behaviour with conventional concrete, Geopolymer Concrete from GGBS can be a potential material for the construction industry in future.

KEYWORDS: Alkaline Activators, Compressive Strength, GGBS, Geopolymer Concrete, Molarity, Split Tensile Strength, Temperature