**Performance Evaluation of Self Compacting Alkaline Activated Concrete on Durability Aspects**

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**Abstract:-**

In the present study, the effect of Ground Granular Blast Furnace Slag (GGBS) on the short term durability performance of fly ash based geopolymer concrete (GPC) specimens was investigated. The low calcium fly ash based Self compacting alkaline activator concrete was produced and then fly ash was replaced with GGBS in 20%, 40%, 60%, 80%, 100% proportions. For the geo polymerization process, the alkaline activator solution has selected a mixture of sodium hydroxide solution (NaOH) and sodium silicate solution (Na2SiO3) with a ratio (Na2SiO3/ NaOH) of 1(one). The main objectives of the study was to investigate the effect of GGBS to low calcium fly ash based self compacting geopolymer concretes instead of Portland cement concrete in structural applications and make a contribution to standardization process of the fly ash based self compacting geopolymer concrete (SCGC). To achieve the goals, six types of mix proportions were subjected to sulfuric acid () and hydrochloric acid (HCl) solutions with concentrations of 5% and 5%, respectively. Visual appearances and change in weight of the SCGC concrete specimens under chemical environments were utilized for durability aspects. Compressive [strength](https://www.sciencedirect.com/topics/materials-science/tensile-strength) test were also performed on specimens to evaluate the mechanical performance under chemical environments. Results indicated that GGBS based self compacting alkaline activator concretes showed superior performance than low calcium fly ash based self compacting geopolymer concretes under chemical attacks due to low calcium content. Amongst all the chemical environments, sulfuric acid (() was found to be the most dangerous environment for all concrete types. By replacing GGBS to low calcium based SCGC specimens improved both durability due to the lower porosity and more dense structure. The replacement of GGBS to fly ash based GGBS specimens showed the superior mechanical performance under chemical environment.

**Keywords:-** SCAAC, Fly ash, GGBS, Durability Characteristics