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Strength and Durability Studies on Geopolymer Concrete Blended with GGBS and Phosphogypsum

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Abstract : This paper presents the progress of the research on making Geopolymer Concrete with Flyash and mineral admixtures such as Ground Granulated Blast Furnace Slag (GGBS) and Phosphogypsum. The present paper gives the results of study on the development of compressive strength and studies on the durability of Geopolymer concrete. In this study an attempt has been made to create Flyash based Geopolymer concrete with partial blending of Flyash with Phosphogypsum) and GGBS (Ground granulated blast furnace slag and to study the strength and acid resistance of produced Geopolymer concrete. The study was conducted to know the compressive strength as well as durability properties of Geopolymer Conccrete such as acid resistance. The cube specimens of size 150 mm side having GGBS and Phosphogypsum as replacement from 0, 2.5, 5, 7.5, 10 % of Flyash . Acid Resistance evaluated by immersion of the above specimens in the solution of 5 % concentrated Sulphuric acid for a duration of 30, 60 and 90days and evaluated the changes in weight of specimens and residual compressive strength at these intervals.

The specimens visual appearance after exposure to Sulphuric acid solution showed that acid attack slightly damaged to specimen surface. The produced Geopolymer concrete sample showed less weight loss in Sulphuric acid solution and having more residual compressive strength at the end of test period. Geopolymer Concrete blended with Phosphogypsum and GGBS and are having higher compressive strength and more resistance against Sulphuric acid.

Key Words : Geopolymer, Flyash, Alkaline Liquids, Phosphogypsum, GGBS, Compressive Strength, Sulphuric Acid, Weight loss, Residual Strength.

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