

Properties of Ground Granulated Blast Furnace Slag Based Geopolymer Concrete

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Abstract : Concrete is one of the most widely used materials across the globe mostly second to water and generating high carbon dioxide emission during its whole manufacturing due to the presence of cement as an ingredient. Therefore it is necessary to find an alternative material to the Portland cement. This study focused on the use of Ground Granulated Blast Furnace Slag as geopolymer binder. Geopolymer concrete can be an alternative material which is produced by the chemical reaction of inorganic molecules. On the other hand, waste generating from power plants and other industries like iron and steel industries can be effectively used which has disposal problems. Therefore in this study geopolymer concrete is manufactured by 100% replacement of cement content by ground granulated blast furnace slag and a combination of sodium silicate and sodium hydroxide is used as an alkaline solution. The results have shown that the compressive strengths increased with increasing curing time and type of alkali activators. Naphthalene sulfonate-based superplasticizer performed better than other superplasticizers. All the specimens have been cast at ambient temperature.

Keywords : alkali activators, concrete, geopolymer, ground granulated blast furnace slag

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