

Evaluation of Properties of Alkali Activated Slag Concrete Blended with Polypropylene Shredding and Admixture

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Abstract : The Ordinary Portland Cement (OPC) is a major constituent of concrete, which is being used extensively since last half century. The production of cement is impacting not only environment alone, but depleting natural materials. During the past 3 decades, the scholars have carried out studies and researches to explore the supplementary cementitious materials such as Ground granulated Blast furnace slag (GGBFS), silica fumes (SF), metakaolin or fly ash (FA). This has contributed towards improved cementitious materials which are being used in construction, but not the way it is supposed to be. The alkali activated slag concrete is another innovation which has constituents of cementitious materials like Ground Granulated Blast Furnace Slag (GGBFS), Fly Ash (FA), Silica Fumes (SF) or Metakaolin. Alkaline activators like Sodium Silicate (Na_2SiO_3) and Sodium Hydroxide (NaOH) is utilized. In view of evaluating properties of alkali activated slag concrete blended with polypropylene shredding and accelerator, research study is being carried out. This research study is proposed to evaluate the effect of polypropylene shredding and accelerating admixture on mechanical properties of alkali-activated slag concrete. The mechanical properties include the compressive strength, splitting tensile strength and workability. The outcomes of this research are matched with the hypothesis and it is found that 27% of cement can be replaced with the ground granulated blast furnace slag (GGBFS) and for split tensile strength 20% replacement is achieved. Overall it is found that 20% of cement can be replaced with ground granulated blast furnace slag. The tests conducted in the laboratory for evaluating properties such as compressive strength test, split tensile strength test, and slump cone test. On the aspect of cost, it is substantially benefitted.

Keywords : ordinary Portland cement, activated slag concrete, ground granule blast furnace slag, fly ash, silica fumes

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