EVALUATION ON TYPES OF FLY ASH AND ALKALINE ACTIVATORS OF GPC

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ABSTRACT:

The Cement production generated carbon dioxide, which pollutes the atmosphere. The Thermal Industry produces a waste called fly ash which is simply dumped on the earth, occupies larges areas. The waste water from the Chemical Industries is discharged into the ground which contaminates ground water. By producing Geo-polymer Concrete all the above mentioned issues shall be solved by rearranging them. Waste Fly Ash from Thermal Industry + Waste water from Chemical Refineries = Geo polymer concrete. Further, use of fly ash as a value added material as in the case of geopolymer concrete, reduces the consumption of cement. Reduction of cement usage will reduce the production of cement which in turn cut the CO_2 emissions. Many researchers have worked on the development of geopolymer cement and concrete for the past ten years .The present work deals with the result of the experimental investigation carried out on geopolymer concrete using processed and unprocessed fly ash with Sodium Silicate and Sodium Hydroxide. The study analyses the effect of processed and unprocessed fly ash on compressive strength & split tensile strength for different temperature. To study the effect of different types of processed & unprocessed fly ash like processed fly ash we use P60, P80 & P100 etc. from, dirk pvt. ltd and unprocessed fly ash form the different cities like Bhusawal, Nashik & Beed etc. in this paper the effect of alkaline solution on different fly ash will be investigated.

KEYWORD: Types of fly ash, forms of sodium hydroxide, geopolymer concrete.

INTRODUCTION:

The production of cement is increasing about 3% annually (McCaffrey 2002). The production of one ton of cement liberates about one ton of CO2 to the atmosphere, as the result of de-carbonation of limestone in the kiln during manufacturing of cement and the combustion of fossil fuels (Roy 1999). The contribution of Portland cement production worldwide to the greenhouse gas emission is estimated to be about 1.35 billion tons annually or about 7% of the total greenhouse gas emissions to the earth's atmosphere (Malhotra 2002). Cement is also among the most energy-intensive construction materials, after aluminium and steel. Furthermore, it has been reported that the durability of ordinary Portland cement (OPC) concrete is under examination, as many concrete structures, especially those built in corrosive environments, start to deteriorate after 20 to 30 years, even though they have been designed for more than 50 years of service life (Mehta and Burrows2001).

RESEARCH REVIEW:

S.V Patankar (Dec 2007) said that, the fineness of fly ash plays a role in the strength development of geopolymer concrete. A higher fineness resulted in a higher workability as measured by the flow test. Geopolymer concrete with the processed fly ash, showed a higher strength than geopolymer concrete with unprocessed fly ash. The rate of strength gain in geopolymer concrete with processed fly ash was higher during 4 to 8 hours the rate reduced thereafter. And the rate of strength gain in unprocessed fly ash was uniform from 4 to 24 hours during temperature curing. The alkalinity of geopolymer concrete was slightly affected by the fly ash fineness but it was similar to that of cement concrete. Curing temperature and its duration are also important in the activation of geopolymer concrete. Curing time, in the range of 6 to 24 hours, produces higher compressive strength. However, the increase in strength beyond 20 hours is not significant. The rate of gain of strength is slow at 60°C compared to strength at 120°C. However, the