

Use of Recycled Concrete Aggregates in Fresh Concrete Production with Metakaolin And Its Effect on Compressive Strength of Concrete.

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Abstract- In this age of development environmental awareness is most important factor for every industry. Now a days enormous development has been occurred in the area of concrete technology. In recent years certain countries have considered the reutilisation of construction and demolition waste as a new construction material. In construction industry concrete is a widely used material but this material depends on the natural resources. This work presents the current status of awareness of reuse of recycled concrete and example of successful uses of alternative materials in concrete technology and to study the effect of metakaolin on the strength of concrete while using metakaolin as a mineral admixture. This study investigates the inter relationship and comparison of results of compressive strength in the presence of Metakaolin.

Keywords :-RCA, Metakaolin, compressive strength, structural load.

Introduction- Concrete is a carefully balanced mix of cement, aggregates and water. While cement acts as the binder

modifying the characteristics and uses of concrete, aggregates, another essential ingredient in concrete, retain the intrinsic properties of rocks that they come from. The color, chemical and physical characteristics of aggregates have a direct impact on the durability, aesthetics and mechanical properties of concrete. Globally the concrete industry consumes large quantities of natural resources.

The most important point is that coarse and fine aggregates are natural resources. The application of recycled aggregates as coarse aggregates in concrete mixes has been initiated so as to make effective use of industrial waste material. When structures made of concrete are demolished or renovated, concrete recycling is an increasingly common method of utilizing the rubble. Concrete was once routinely trucked to landfills for disposal, but recycling has a number of benefits that have made it a more attractive option in this age of greater environmental awareness, more environmental laws, and the desire to keep construction costs down.

Smaller pieces of concrete are used as gravel for new construction projects. Using recycle material as coarse aggregates reduces use of gravel mining. Recycling one ton of concrete could save 1,360 gallons water, 900 kg of carbon dioxide. Save environment there is no excavation of natural resources and less transportation. Recycled concrete aggregates (RCA) produced from aged concrete that has been demolished and removed from old concrete structures it often contains a large amount of cement plaster, plaster of paris, lime etc.

Metakaolin is a calcined product of the clay mineral kaolinite. The particle size of metakaolin is smaller than cement particles, but not as fine as silica fume.

Mateials and experimental method

Cement –Prism 43 grade OPC

Achieve more than the specified strength as per the relevant IS Code through proper adjustment in the chemical composition.

EXPERIMENTAL AND RESULT ANALYSIS-

Compressive strength of concrete

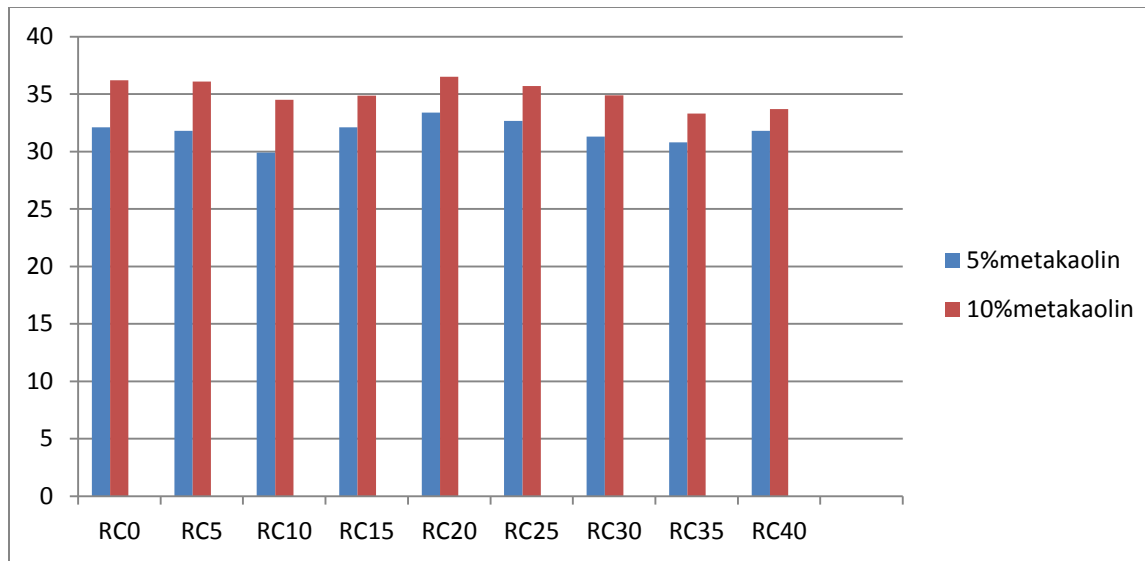
Sr.no.	Mould No.	28 days compressive strength in n/mm ²	
		Adding 5%metakaolin	Adding 10% metakaolin
1.	RC0	32.10	36.21
2.	RC5	31.80	36.10
3.	RC10	29.90	34.50
4.	RC15	32.10	34.85
5.	RC20	33.39	36.54
6.	RC25	32.65	35.70
7.	RC30	31.30	34.90
8.	RC35	30.80	33.30
9.	RC40	31.80	33.70

High quality lime stone deposit results in- Higher strength of cement. Moderate sulphate resisting properties. Lower level of chloride concentration Efficient quality control and high level of control in process parameter results in reduced free lime, low insoluble residue and loss on ignition.

Metakaolin –brand name SRM, obtained by ram minerals kutch gujrat.

Experimental details -The main objective of this work is to study the effect of replacing natural coarse aggregates by Recycle concrete

aggregate(0%,5%,10%,15%,20%,25%,30%,35%,40%) with use of metakaolin 5% or10% adding by weight of cement as a mineral admixture and to study the effect on workability, compressive strength and on flexural strength of concrete. we are using M20 grade concrete with ratio of 1:1.5:3 (cement: F.A.:C.A.)



Result analysis- According to results there is a 13% increase in strength for RC20 cube when we are adding metakaolin by weight of 10% of cement as a admixture and in RC20 20% natural aggregates are replaced by recycle coarse aggregates.

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