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Patent Search

Invention Title	Effect of coarse aggregate, marble, granite cutting waste, metakaolin and admixtures on mechanical performance of concrete
Publication Number	35/2023
Publication Date	01/09/2023
Publication Type	INA
Application Number	202341052121
Application Filing Date	03/08/2023
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	BIO-CHEMISTRY
Classification (IPC)	A61P0031040000, G01N0003080000, G06T0009000000, C04B0040000000, G01N0033380000

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Abstract:

The development of property studies related to the properties of concrete has allowed the effective measurement of materials, including the incorporation of marble waste in their production, as well as the development of specific products to improve their properties. In this work, a reference concrete was created in order to study to improve its mechanical properties. The effect of mixing two types of coarse aggregate of the same mineralogical origin was evaluated, replacing the fine aggregate and Granite Cut Waste (MGCW) and adding metakaolin, fibers and additives to increase the mechanical strength in relation to the reference concrete. Tensile and con tests were therefore performed after seven days. With the results obtained, it was possible to perceive that the use of Metakaolin in combination with a superplasticizer presented the best performance, increased the compressive strength by 50% and did not affect the tensile strength. Accompanied Drawing [FIG. 1] [FIG. 2] [FIG. 3]

Complete Specification

Description: The proposed invention related to the effect of coarse aggregate, marble, granite cutting waste, metakaolin and admixtures on mechanical performance of concrete.

[02] BACKGROUND OF THE INVENTION

According to literature, the choice of appropriate materials and dosage methods are essential for the production of concrete that meets the specifications of strength and durability of structures, at the lowest possible cost. Concrete is the material most used in current structures, which is basically composed of: cement, water and aggregate, small and large.

To make concrete, it is necessary to add cement, and there are several types of Portland cement, depending on their composition. Initial high strength Portland cement designated by the acronym CPV-ARI. Due to the dosage with limestone and clay in the production of clinker and finer grinding, when reacting with water it acquires strength with greater speed. Other components are the aggregates, these intended for the production of Portland cement concrete, these must meet the requirements prescribed by Indian standard – Aggregates for concrete – Specification.

In addition to the resistance of the aggregates, the size, shape and texture of the surface and the granulometry (distribution and mineralogy) influence the properties of concrete, among which resistance, and the choice of coarse aggregate is also important. The most complex, since the physical, chemical and mineralogical properties considerably affect the mechanical properties of concrete, such as strength and durability.

From literature, the smaller coarse aggregates are more resistant than the larger aggregates, since during the crushing process, the rocks break in the weak zones. In this way, the smaller the coarse aggregate used, the lower the incidence of weak zones. That said, resistance is generally considered to be the most important property.

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Page last updated on: 26/06/2019