

Investigating the trend of increasing the strength of concrete in optimal mixing scheme Using sulfate and limestone in acidic environments

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ABSTRACT

Today, various concrete for special purpose is intended for use in certain circumstances, some of which include the construction of high strength concrete, durable concrete, high performance concrete and underwater waterproofing. It is worth mentioning. For many years, concrete durability has been considered in various environments. Finding failures with physical and chemical factors in concrete in most parts of the world and in developing countries has driven thoughts and minds of engineers and chemists towards a single plan with a specific and durable characteristic. In this research, replacement of common rocks of concrete with lime and Silica and concrete strength against acid corrosion have been investigated. For this purpose, the number of concrete samples was made and placed in solutions of sodium and magnesium sulfate. Then, at different time intervals, weights, dimensions and strength of the samples were examined and the results were considered on the samples and solutions as the basis of the judgment. According to the results of the experiments, it is observed that the samples made with calcareous compounds have more endurance and resistance in acidic and corrosion environments. According to statistical analysis, calcareous samples showed more than 75% improvement in endurance in acidic and corrosive environments. Therefore, the use of limestone is a practical proposal to increase the strength of concrete. The effect of using limestone rocks as a substitute for rocks of common rocks used in the manufacture of concrete, which is generally silica, is also investigated using an optimal mixing scheme to achieve minimum permeability to acidic corrosion of concrete. For this purpose, concrete specimens containing limestone stones with optimal mixing design were constructed and placed in 75% sulfuric acid solution and the results of weight, dimensions and compressive strength tests were compared.

Keywords: concrete, calcareous aggregates, silica aggregates, compressive strength, endurance.