

## **Synthesis of Graphene Oxide and Study on Strength Properties of Graphene Oxide in Cement Mortar**

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### **ABSTRACT**

Being a binder cement helps in increasing the strength of cement-based product. Also act as pollutant by emitting CO<sub>2</sub>. In order to control the emission of CO<sub>2</sub> quantity of cement is reduced and increase the strength by adding graphenebased Nano material. In This experimental study grapheme oxide (GO) is synthesized by Modified Hummer's method and it is added to cement mortar to find the approximate percentage of GO that enhance the strength property. The test specimens of size 70.6mm\*70.6mm\*70.6mm were used. The quantity of materials (cement, fine aggregate and water) were taken as per IS 4031 part 6. The percentage of graphene oxide taken for this study is 0, 0.025, 0.05, 0.075, and 0.1 by weight of cement. Cubes were casted for each percentage and tested for compression strength at the period of 3, 7, 14, 28 days and prism of sizes 100mm\*75mm\*75mm are casted for all the mixes and are tested for flexural strength. The compressive strength and flexural strength of the mix with 0.075% GO has shown a better result compared to rest of the mixes. Regression analysis were done to predict the strength values for any percentage of GO.

**Keywords** Nano material, modified Hummers method, cement mortar, graphene oxide (GO), IS4031-part 6