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Thermal Stability and Insulation of a Cement Mixture Using Graphene Oxide Nanosheets

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Abstract : The impressive physical properties of graphene derivatives, including thermal properties, have made them an attractive addition to advanced construction nanomaterial. In this study, we investigated the impact of incorporating low amounts of graphene oxide (GO) into cement mixture nanocomposites on their heat storage and thermal stability. The composites were analyzed using Fourier transmission infrared, thermo-gravimetric analysis, and field emission scanning electron microscopy. Results showed that GO significantly improved specific heat by 30%, reduced thermal conductivity by 15%, and reduced thermal decomposition to only 3% at a concentration of 1.2 wt%. These findings suggest that the cement mixture can withstand high temperatures and may be suitable for specific applications requiring thermal stability and insulation properties.

Keywords : cement mixture composite, graphene oxide, thermal decomposition, thermal conductivity
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