

Effects of edge-oxidized graphene oxide (EOGO) in metakaolin based geopolymer composite

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ABSTRACT

This study investigates the effects of edge-oxidized graphene oxide (EOGO), an affordable carbon-based nanomaterial, on metakaolin-based geopolymer composites through microstructural analyses and evaluations of physical and mechanical properties. Various concentrations of graphene oxide (ranging from 0.01% to 1.0% by weight of metakaolin) were integrated into the geopolymer matrix. The resultant composites were characterized through a series of mechanical tests, including compressive strength and flexural strength measurements, as well as microstructural analyses using scanning electron microscopy (SEM) and X-ray diffraction (XRD). The findings reveal that the addition of graphene oxide significantly enhances the mechanical properties of the metakaolin geopolymer. These results suggest that graphene oxide serves as an effective nano-reinforcement for metakaolin geopolymers, leading to superior mechanical properties and potential applications in construction and materials engineering where enhanced strength and durability are required.

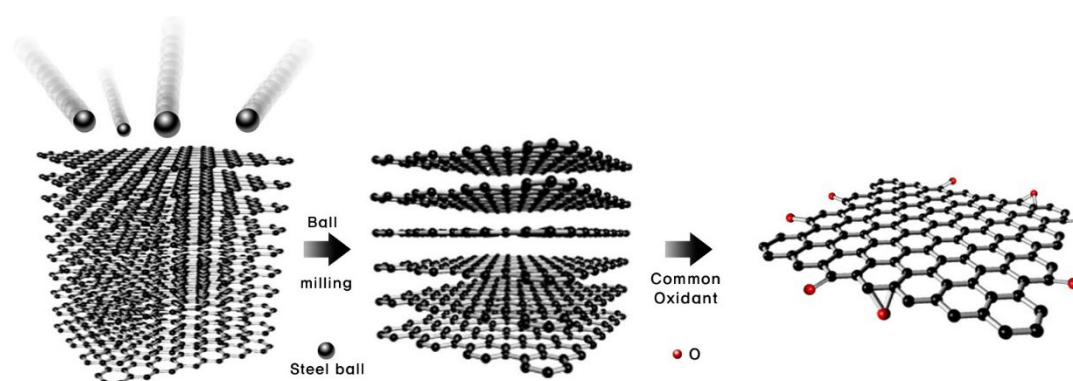


Fig. 1 Production process of edge-oxidized graphene oxide [1]

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