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Review

A Critical Review on Research Progress of Graphene/Cement Based Composites

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A Critical Review on Research Progress of Graphene/Cement Based Composites

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Abstract

Cement based composite materials (CBCM) with superior mechanical strength and excellent durability are always desirable in practical applications. Although considerable research has been reported in the past decades about the use of Nano materials (NMs) for strength and durability enhancement of cement matrix, there is little information available on the use of graphene nano-sheets and their derivatives (GND) in cement-based materials. Particularly the role of GND in hydration processes and their mechanisms of strengthening in cement matrix are unclear. In this paper, a critical review on recent research findings about GND modified cement-based materials was conducted. The review mainly discussed the influence of GND on properties of cement matrix including microstructure, hydration, mechanical properties, etc. The information revealed in this paper would not only provide a comprehensive understanding of the effect of GND on cement composites, but also provide valuable ideas and guidance for similar studies in the future.

Keyword: Graphene; Cement based materials; Characterization; Mechanism.

Abbreviations

CBCM	Cement based composite materials
NMs	Nano materials
GND	Graphene nano-sheets and their derivatives, including GO and rGO
GNPs	Graphene nanoplates
GO	Graphene oxide
rGO	Reduced graphene oxide

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