Smart Nanomaterials Technology

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Applications of Nanomaterials in Civil and Environmental Engineering

Towards Sustainable Development and Environment Remediation

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Contents

Impact of Graphene Oxide on the Mechanical Properties of Portland Cement Composites

Mohd. Sufian Abbasi, Noureen Ansari, Mohd. Azhar, Mohd. Samiullah, Neda Tabassum, Syed Aqeel Ahmad, and Qazi Inamur Rahman

Abstract This chapter investigates the transformative influence of Graphene Oxide (GO) on the strength properties of Portland Cement composites, delving into the realm of nanomaterial reinforcement for advanced construction materials. Focusing on the enhancement of compressive, flexural, and tensile strength, Impact and Fracture Toughness, the study explores the multifaceted interactions between GO and the cementitious matrix. Beginning with an overview of the essential characteristics of GO, the chapter provides insights into synthesis and incorporation techniques for GO in Portland Cement composites, setting the stage for understanding its potential as a reinforcement agent in Portland Cement composites. The findings from this chapter contribute to the evolving landscape of nanomaterial-modified cementitious systems, offering a deeper understanding of how GO can be harnessed to propel the strength performance of Portland Cement composites. As the construction industry seeks sustainable and high-performance solutions, this chapter provides a valuable resource for scholars, engineers, and practitioners aiming to advance the frontier of modern construction materials.

Keywords Graphene oxide · Portland cement · Advanced cement materials · Mechanical properties

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