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MICROSTRUCTURAL CHARACTERIZATION OF CONCRETE WITH GRAPHITE PARTICLE AGGREGATES

Concrete is one of the most widely used materials in civil construction. It is a rock created artificially by mixing fine and coarse aggregate components, cement, and water. In this research work, the analysis of the interfacial transition zone in the concrete microstructure by adding different graphite contents, partially replacing the weight of cement, is presented. The morphology and microstructure of the paste/aggregate interface were analyzed using X-ray Diffraction (XRD) and Scanning Electron Microscopy (SEM) characterization techniques. It was determined that the concrete matrix with low carbon percentage addition acquired a more compact microstructure, with lower permeability and porosity. The graphite filled the pores of the paste and consequently increased the development of calcium silicate hydrate (CSH) in the cement hydration. These mechanisms accounted for the increase in the compressive strength of the concrete.

Keywords

Concrete, graphite, microstructure, interfacial transition zone

Reference

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Author approval

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