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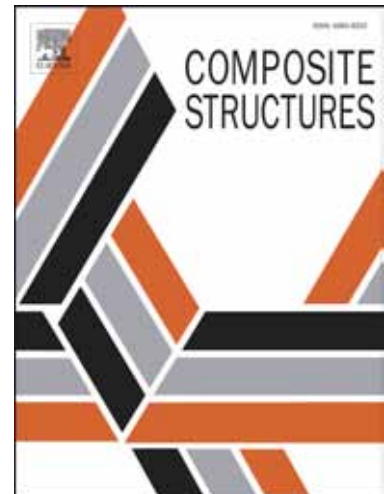
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Effect of superplasticizer type and siliceous materials on the dispersion of carbon nanotube in cementitious composites

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Abstract

The influences of superplasticizers and siliceous materials on the dispersion of carbon nanotube (CNT) in cementitious composites were investigated. Three types of superplasticizer were used, and the siliceous materials such as silica fume and nano-silica were utilized as dispersion agents. The dispersion characteristics of CNT in the state of aqueous solution were explored via the UV-Vis spectra, the zeta potential, while those of CNT in the cementitious matrix were investigated via the electrical characteristics of the CNT-incorporated cementitious composites and scanning electron microscopy images. The dispersion mechanism of CNT induced by the superplasticizers and the siliceous materials was thoroughly examined. The superplasticizers containing polycarboxylate were effective to disperse CNT in cementitious composites compared to other types of superplasticizers used here. The addition of silica fume to cementitious composites utilizing the superplasticizers with polycarboxylate was further improved the dispersion of CNT, while nano-silica did not improve the dispersion of CNT.

Keywords: Superplasticizer; Nano-silica; Carbon nanotube; CNT-incorporated cementitious composite; Electrical resistivity

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