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Influence of imperfections on carbon nanotube properties

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ABSTRACT

Theoretical and experimental research of polymer and other composites, up to now, have shown that carbon nanotubes, as a reinforcement, significantly improve the mechanical properties of aforementioned composites, thanks to their extremely high tensile strength and modulus of elasticity. However, different defects within nanotube structure, such as vacancy defects or waved shape of the nanotube, can greatly influence the mechanical properties of carbon nanotube and thus decrease the final mechanical properties of carbon nanotube reinforced composites. In this paper, the properties of straight and waved carbon nanotubes are investigated and compared using finite element method. Also, different vacancy defects are considered and presented on straight and waved carbon nanotubes, armchair, and zig-zag pattern.

KEYWORDS: carbon nanotube, waviness, vacancy defect