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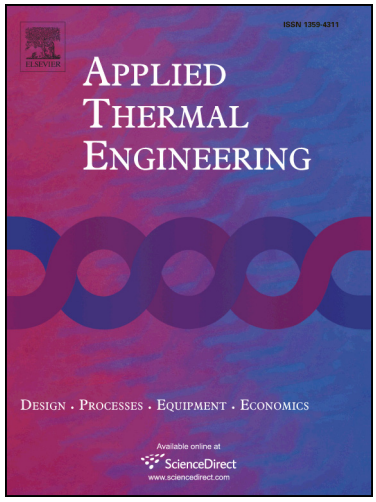

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Effective Thermal and Mechanical Properties of Short Carbon Fiber/Natural Rubber Composites as a Function of Mechanical Loading

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Abstract

Carbon fibers significantly improve thermal and mechanical properties of nanocomposites, and many researchers have focused their studies on determining the effective thermal and mechanical properties of these composites. Much effort has gone into determining how mechanical loading changes the effective properties of the nanocomposite, and studying its behavior under further mechanical loading. In the present study, a computer simulation of three different volume fractions of carbon fibers in natural rubber was subjected to eight loading scenarios, each, to study the effect of loading conditions on the effective thermomechanical properties of the nanocomposites. Results suggest that mechanical loading can improve the effective thermal conductivity and increase the elastic modulus of the nanocomposite.

Keywords: Thermal Conductivity, Elastic Modulus, Poisson's Ratio, Short Carbon Fiber, Nanocomposite, Mechanical Loading

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