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## Energy Conversion Behaviors of Antimony Telluride Particle Loaded Partially Carbonized Nanofiber Composite Mat Manufactured by Electrohydrodynamic Casting

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### Abstract

This work deals with the processing and energy conversion performance characterization of a partially carbonized nanofiber composite material containing antimony telluride ( $\text{Sb}_2\text{Te}_3$ ) particles made by a new manufacturing technology of electrohydrodynamic casting. Dimethylformamide (DMF) dissolved polyacrylonitrile (PAN) polymer solution with a concentration of 10% was used as the precursor to generate the partially carbonized nanofibers. The antimony telluride particles were added into the polymer solution and electrohydrodynamically cast onto a soft tissue paper substrate to form a flexible composite fiber mat. The polymeric matrix composite mat was heat treated in hydrogen gas atmosphere to form partially carbonized nanofiber loaded with Sb-Te alloy fine particles. Scanning electron microscopy (SEM) analysis was performed to reveal the morphology and the composition of the composite material. Energy conversion behaviors in view of converting electromagnetic wave

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