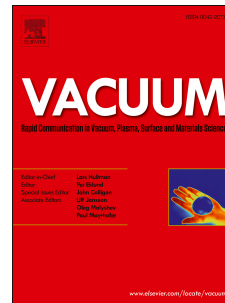


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Effect of carbon nanotubes and silicon carbide particles on ablative properties of carbon fiber phenolic matrix composites

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Abstract

Hybrid carbon fiber phenolic matrix composites containing carbon nanotubes and silicon carbide particles were characterized against oxyacetylene torch test to investigate the individual and combined effect of particulate reinforcement on ablative properties. The composite containing 5wt% silicon carbide particles reduced the ablation rate to 33% while the one containing 0.1wt% carbon nanotubes lowered the rate to 9%. The combined effect of 5wt% silicon carbide particles and 0.1wt% carbon nanotubes resulted 43% reduction in ablation rate. In terms of weight fraction of the two particulate reinforcements, the effect of carbon nanotubes on ablation properties was found to be significantly greater than silicon carbide particles while their combined incorporation synergically improved the ablative properties.

Keywords: Carbon fibers; Phenolic resin; Carbon nanotubes; Silicon carbide; Composite; Ablation

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