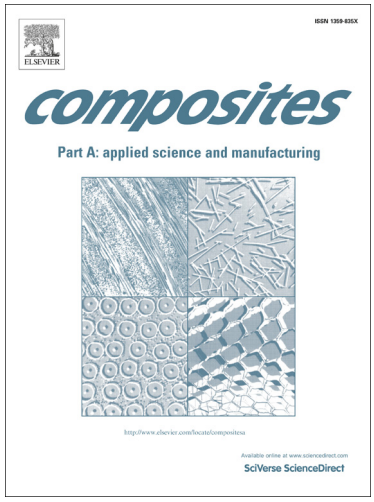

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Abstract

In this study, phenolic foam (PF)/multi-walled carbon nanotubes (MWCNTs) composites were fabricated by in-situ polymerization, and carbonized foams based on these PF foams were prepared and the electrical property was investigated. TEM results indicated excellent dispersion of MWCNTs in the phenolic resin matrix. Scanning electron microscope results indicated that PF composites exhibited smaller cell size, thicker cell wall thickness, and higher cell density, compared with pure PF. The incorporating of MWCNTs significantly improved the mechanical properties of PF. All PF composites showed a lower thermal conductivity versus pure PF. Moreover, the carbonized pure and composites PF exhibited open-cell three-dimensional skeleton carbon structure and the MWCNTs were well-dispersed on the surface of the skeletons. It is noteworthy that the introduction of MWCNTs significantly improved