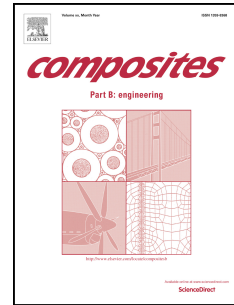


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## The influence of processing techniques on the matrix distribution and filtration of clay in a fiber reinforced nanocomposite

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### Abstract

A nano-modified matrix based on an epoxy resin and montmorillonite (MMT) layered silicates, was successfully infiltrated through 10 ply of carbon fiber preform. A combined fabrication process of a vacuum assisted resin infusion method (VARIM) followed by a rapid heating rate and mechanical vibration during cure, facilitated the infiltration of the nano-modified matrix through the preform. This was achieved by dispersing the MMT clay in the resin and ensuring that the viscosity of the nano-modified matrix remained low during fabrication. SEM-EDX (energy dispersive X-ray spectroscopy) spectra showed that chemical constituents within MMT clay including silicon, aluminium and magnesium elements had permeated through the fiber preform and were detected throughout the laminate. A homogeneous resin/particle distribution was achieved with the size of clay particles ranging from 100 nm to 1  $\mu$ m.

**Keywords:** A. Carbon fibre, A. Nano structures, A. Particle Reinforcement

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