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The Effectschemical Treatment on Alkyl Phenol Modified Sisal Fiber Reinforced Epoxy Composite

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Abstract : The aim of this manuscript was to evaluate the effect of chemical treatment of sisal fibre on the mechanical and viscoelastic properties of bio based epoxy/fibre composites. The composite samples were manufactured through a vacuum infusion process by adding alkyl phenols from cashew nutshell liquid (CSNL). Changes in the chemical structure of the sisal fibres resulting from the treatments were analyzed by Fourier transform infrared spectroscopy (FTIR). Both alkali and silane treatments produced enhancements in the mechanical properties of sisal fibre bundles. The alkali treatment, when combined with the silane treatment, the mechanical properties of epoxy composites notably improved (13%) in comparison to untreated sisal fibre reinforced composites.This was attributed to an enhanced fibre/matrix interface. The incorporation of CSNL into the sisal/epoxy composite enhanced the fibre-matrix interfacial properties because of the addition of -OH groups to the epoxy matrix. The incorporation of sisal fibre imparts stiffness to the epoxy matrix.

Keywords : phenalkamine, sisal fiber, vacuum infusion, cashew nutshell liquid, cashew nutshell liquid (CSNL)
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