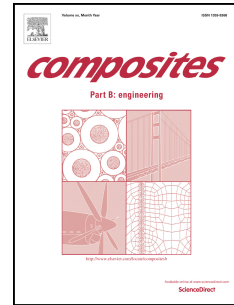


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Dynamic mechanical thermal analysis (DMTA) of cellulose nanofibril/nanoclay/pMDI nanocomposites

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Abstract

Cellulose nanofibrils and montmorillonite nanoclay were used to reinforce polymethylene diphenyl diisocyanate (pMDI) resin at loading levels ranging from 1 to 5%. Laminate sandwich samples were prepared using nano-reinforced resin and wood strands. The laminate samples were analyzed for viscoelastic properties using dynamic mechanical thermal analysis (DMTA). Results obtained in this study showed that storage modulus, final cure temperature, and storage modulus at final cure of the pMDI resin were affected by nanoparticle reinforcement. The highest storage modulus was obtained for the 1% cellulose nanofibril reinforced pMDI-wood laminate sample. It was found that the neat pMDI resin had a slightly higher (max %3.82) final cure temperature compared with the pMDI resin reinforced with cellulose nanofibril or nanoclay at different loading levels.

Keywords: *A. Wood; A. Nano-structures; A. Thermosetting resin;*

B. Mechanical properties; Wood Composites

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