

Thermogravimetric analysis and dynamic young's Modulus measurement of N,N-Dimethylacetamide-impregnated wood polymer composites.

ABSTRACT

Mercerized wood species were impregnated with N,N-dimethylacetamide. Their Fourier transform infrared spectra then showed enhanced absorption at 1419 cm⁻¹ ([BOND]C[BOND]/CH₃), and the 1267-cm⁻¹ ([BOND]N[BOND]/CH₃) stretching band confirmed the occurrence of a modification reaction. Thermogravimetric investigation of the resultant wood polymer composites (WPCs) indicated a better thermal stability in comparison with that of the raw wood. The dynamic Young's modulus of the WPCs was significantly increased compared with that of raw wood. After modification, analysis by scanning electron microscopy showed porous cells of raw wood filled with the polymer, which led to the better stability of WPCs. Analysis by XRD indicated that the crystallinity of WPCs increased because of an increase in the stiffness and the thermal stability of the composites.

Keyword: Wood polymer composite; Young's Modulus.