

Dimensional Stability and Mechanical Behavior of Rubber Wood-Polymer Composites Processed By Gamma Radiation

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ABSTRACT

Wood Polymer Composites (WPC) based on rubber wood (*Hevea brasiliensis*), were prepared using various vinyl monomer based formulations and processed by Co-60 gamma radiation source for polymerization in order to overcome the undesirable properties of rubber wood whilst retaining inherent characteristics. These composites were shown to improve the dimensional stability and mechanical properties of rubber wood. Improvement in ultimate strength and modulus were obtained with the best result obtained at 30 kGy. These improvements were ascribed to efficient penetration of monomer into the cell walls. Scanning electron microscopy (SEM) confirmed strong interaction of the polymer generated *in situ* the wood cell wall components, consistent with the property improvements obtained. Because of non-staining and non-toxic properties of impregnated polymers, these composites offer unique opportunities for increased use of wood-polymer composites in a wide variety of structural and insulating applications.

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