

Wood/PVC/Clay Nanocomposites: Preparation and Thermo-mechanical Properties

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Wood plastic composites (WPCs) have been attracting lots of interest because they are economic and have reasonable physical properties. Poor interfacial bonding between wood particles and a polymer matrix would decrease mechanical properties such as tensile and impact strength drastically. We used amino silane as a coupling agent to improve interfacial adhesion. Furthermore, to improve the performance of a wood/PVC composite, a small amount of clay was incorporated as nanosize filler into the WPC. The effects of the clay and silane-treated wood particles were investigated. WPC specimens were fabricated by melt-blending followed by compression molding, and their physical properties were investigated by UTM, izod impact tester, DMA, TMA, TGA, and XRD. SEM images for the fracture surfaces of the WPCs confirmed the role of the coupling agents by showing strong interfacial adhesion between wood particles and the polymer matrix. Mechanical properties of the wood /PVC nanocomposite were considerably improved by incorporating the coupling agent and the clay.