

Physical Properties of Aminosilane-Treated Wood Flour/PVC Composites Comprising Organoclay

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Advantages of natural fibers over traditional ones are low cost, high toughness, low density, good specific strength properties, reduced tool wear. However, the properties of the composites with natural fibers are inferior to those of the unfilled PVC because of poor interfacial adhesion between the hydrophilic wood flour and hydrophobic PVC. We treated wood flour with aminosilane to improve interfacial adhesion and used organoclay as nanosize filler into the composites. The effects of the aminosilane-treatment and organoclay on the physical properties of the wood flour/PVC/clay nanocomposites were investigated. The treatment of the wood flour was characterized by X-ray photoelectron spectroscopy. Physical properties of the composites specimens were investigated by UTM, izod impact tester, DMA, TMA, TGA, and XRD. SEM images for the fractured-surfaces of the WPCs gave important information on the fracture mechanics of the WPCs. Physical properties of the wood /PVC nanocomposites were considerably improved by treating wood flour and incorporating the organoclay.