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2008 NSTI Nanotechnology Conference and Trade Show - Nanotech 2008 - 12th Annual

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Biodegradable composites based on Starch/EVA blends and coir

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Keywords:
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Abstract:

The use of biodegradable materials from renewable resources has gained more attention in recent years. The advantages of natural fiber composites are their low density, low cost, renewable characteristics and complete biodegradability. In this study, unripe coconut fibers were used as reinforcement in a biodegradable polymer matrix of starch/EVOH. The effect of fiber treatments (washing with water and mercerization) on the properties of the biocomposites was evaluated by tensile and thermal properties. This study revealed that the treatments produced modifications on the surface and improved the thermal stability of the fibers and consequently of the composites. The best results were obtained when fibers were mercerized. In this case, tensile strength increased by about 52.8% compared to composites made with untreated fibers, and 33.3% compared to composites without fiber, indicating that the conditions of mercerization used promoted better fiber-matrix adhesion, allowing an efficient stress transfer from the matrix to the fibers. This was also supported by scanning electron microscopy analyses. Both treatments produced improved values for tensile modulus by ca. 75% compared to blends without fibers. This work indicated that starch/EVOH blends reinforced with treated unripe coconut fibers have superior mechanical properties compared to starch/EVOH blend.

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Nanotech 2008 Conference Program Abstract

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