

Synthesis and Characterization of Recycled Isotactic Polypropylene Nanocomposites Containing Date Wood Fiber

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Abstract : Nanocomposites of isotactic polypropylene (iPP) and date wood fiber were prepared after modification of the host matrix by reactive extrusion grafting of maleic anhydride. Chemical and mechanical treatment of date wood flour (WF) was conducted to obtain nanocrystalline cellulose. Layered silicates (clay) were partially intercalated with date wood fiber, and the modified layered silicate was used as filler in the PP matrix via a melt-blending process. The tensile strength of composites prepared from wood fiber modified clay was greater than that of the iPP-clay and iPP-WF composites at a 6% filler concentration, whereas deterioration of mechanical properties was observed when clay and WF were used alone for reinforcement. The dispersion of the filler in the matrix significantly decreased after clay modification with cellulose at higher concentrations, as shown by X-ray diffraction (XRD) data.

Keywords : nanocomposites, isotactic polypropylene, date wood flour, intercalated, melt-blending

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