27th PPS Annual meeting
2011, Marrakech, Morocco

OP-2-1326

Wednsday, May 11, 2011, 05:00-05:20 pm
Room: Reda 5

EFFECTS OF WOOD FILLER ADDITION AND PROCESSING METHOD ON THE DYNAMIC MECHANICAL PROPERTIES OF WOOD PARTICLE/HDPE COMPOSITES

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The effects of wood filler size, species and load and processing methods on the dynamic mechanical properties of wood particle/HDPE composites were investigated. Storage modulus (E′) decreased with an increase in temperature. A clear effect of species on E′ was observed. Jack pine-based composites showed the highest E′, attributed to better interfacial adhesion between jack pine wood fiber and HDPE matrix. In HDPE, α-relaxation peak marginally shifted to high temperature regions with the addition of wood fiber and the resultant loss modulus (E″) increased by 17% to 30%, indicating more viscous dissipation. Slow cooling and quenching of extruded samples significantly affected the α-peak temperature. E′ increased with an increase in frequency, whereas tan δ and E″ decreased. Moreover, the α-peak tended to shift to lower temperatures as frequency decreased. A slight increase in ΔE was detected after wood particle addition, which may be explained by the increase in crystallinity due to the nucleation efficiency of wood filler.