THE EFFECT OF UTILISING THERMALLY DEGRADED LDPE AS A COMPATIBILIZER IN LDPE/WOOD COMPOSITES

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ABSTRACT

The effects of degraded LDPE as compatibilizer on the morphology, as well as thermal, mechanical, and thermo-mechanical properties, of LDPE/pine wood fibre composites were investigated in the current study. The LDPE was thermally degraded in an air oven at 80 °C, and the composites were prepared through melt mixing in a Brabender Plastograph internal mixer. Fourier-transform infrared (FTIR) spectroscopy showed an increase in carbonyl peak with increasing time of thermal degradation. The formation of functional groups during the degradation enables the degraded LDPE to be used as a compatibilizer. Samples of different compositions were characterized by using scanning electron microscopy (SEM), differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), tensile testing and dynamic mechanical analysis (DMA). Addition of degraded LDPE as compatibilizer seems to enhance the tensile properties of the LDPE/pine wood fibre composites. Other results like the thermal stability from TGA, morphological properties from SEM, melting and crystallization behaviour from DSC, and thermomechanical properties from DMA will be presented and discussed.