

Preparation And Characterization Of Wood Plastic Composite Reinforced By Organoclay

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ABSTRACT

This paper presents the preparation and characterization of the wood polymer composite (WPC) prepared from wood flour, polypropylene and organoclay (Cloisite® 20A). Nanoclays with different concentrations (1, 2.5, 4 and 5 wt%) were used as reinforcing filler for WPC. Maleic anhydride grafted polypropylene was added as a coupling agent to increase the interaction between the components of the WPC. Nanoclay based WPC were made by extrusion process followed by injection molding. Mechanical, water absorption, morphology, structural and thermal properties of the as-prepared composites were evaluated. The result of strength measurements indicated that when 1 and 2.5 wt% nanoclay were added, the tensile and flexural strength reached their maximum values. When maintaining the nanoclay at a low concentration, it was well dispersed in the WPC. However, when high nanoclay (4–5 wt%) was introduced, the improving effect began to diminish because of the agglomeration of nanoclay which caused weak interfacial bonding. The water absorption results showed a lower value with the addition of 1 wt% nanoclay, and the thermal tests exhibited that the degradation temperature shifted to higher value clearly after the addition of nanoclay over the WPC. The formation of WPC was confirmed by the Fourier transform infrared spectroscopy analysis.

KEYWORDS: Wood polymer composites; Organoclay; Injection moulding; Mechanical properties; Physical properties; Thermal properties

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