THERMAL AND MECHANICAL PROPERTIES OF POLYMER BLEND/WOOD FLOUR COMPOSITES

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Abstract

In this study, polypropylene (PP) and maleic anhydride grafted polypropylene (MAPP) are respectively blended in 50/50 ratios with EVA to form polymer blends, and wood flour (WF) is added at concentrations of 10, 20 and 30% to form PP/EVA-WF and MAPP/EVA-WF blend composites respectively. Thermal (DSC, TGA), dynamic mechanical (DMA) and tensile properties of these composites were investigated. EVA/PP and EVA/MAPP blends are immiscible as indicated by two melting peaks in the DSC. From the DSC results it is clear that the wood flour is primarily concentrated in the EVA phase of the EVA/PP blends. In the EVA/MAPP blends wood flour seems to be in the MAPP phase also, although all indications are that the wood flour still preferably goes to the EVA phase. TGA results show that the EVA/MAPP blend is more thermal stable than the PP/EVA blend. The EVA/MAPP/WF composites are also more thermally stable than the EVA/PP/WF composites. Generally, thermal stability decreases with increasing wood flour content. Tensile results show that the EVA/MAPP/WF composites have superior mechanical properties, probably because of the more even distribution of WF between EVA and MAPP.