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# Preparation and Characterisation of Polyethylene-Octene Grafted Maleic Anhydride-Toughened 70:30 PA6/PP/MMT Nanocomposites

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## SUMMARY

A series of nanocomposites consisting of a polyamide 6 (PA6) and polypropylene (PP) matrix (70:30) with a maleated polyethylene-octene elastomer (POEgMAH) and organophilic modified montmorillonite (MMT) were prepared by melt compounding in a co-rotating twin-screw extruder followed by injection moulding. The weight fraction of organoclay was adjusted from 2 - 10 wt% by increments of 2 wt% and the weight fraction of POEgMAH was fixed at 10 wt%. POEgMAH was used as an impact modifier as well as compatibiliser in the nanocomposites. Mechanical properties of the blends were investigated by tensile, flexural and impact testing. X-ray diffraction (XRD) was used to characterise the nanocomposites. The thermal properties were studied by differential scanning calorimetry (DSC) and thermogravimetric analysis (TGA). Addition of 4 wt% organoclay showed the highest tensile and flexural strengths for the blends. The Young's and flexural moduli were also improved with increasing the organoclay concentration but with a corresponding reduction in impact strength and elongation at break. XRD result revealed that the organoclay was dispersed uniformly (exfoliated) although the degree of exfoliation decreased with increasing organoclay content. The DSC analysis showed that the crystallinity of the blends decreased with increasing organoclay concentration. It was shown from the TGA analysis that the thermal stability of the PA6/PP nanocomposites was significantly improved in the presence of impermeable silicate layers in the blends.

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