
The Effect of Polyethylene-Octene Elastomer on the Morphological and Mechanical Properties of Polyamide 6/ Polypropylene Nanocomposites

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SUMMARY

Rubber-toughened nanocomposites (RTNC) consisting of ternary blends of polyamide 6 (PA6), polypropylene (PP) and polyethylene-octene elastomer (POE) containing 4 wt% of organophilic modified montmorillonite were produced by melt compounding followed by injection moulding. The blend composition was kept constant (PA6/PP=70/30 parts by weight) while the POE content was varied between 5 and 20 wt%. Maleated PP (PP-g-MA) was used as compatibilizer. The morphology of the RTNC was studied by scanning electron microscopy and X-ray diffraction (XRD). The mechanical properties of RTNC were studied through tensile, flexural, Izod impact and fracture toughness properties. While the tensile and flexural properties were found to decrease with the increasing concentration of POE, the toughness was significantly enhanced as compared to the neat PA6/PP blends. In general, the blends containing 10-15 wt% of POE had the best balance of stiffness, strength and toughness. The addition of 30 wt% of PP in the PA6 matrix improved the compatibility between PA6 and the rubber phase. XRD established that the organoclay was well dispersed (exfoliated) and preferentially embedded in the PA6 phase.

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