

Unmodified and Organo-Modified Clay Content Effect On Mechanical and Thermal Properties of The Waste Low Density Polyethylene.

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Abstract

The Organo modified and unmodified sodium montmorillonite clay effect on thermal and mechanical properties of the waste low density polyethylene (wLDPE) were studied. Commercialize unmodified (MMT) and Organo-modified clay (OMMT) were added to the wLDPE to prepare wLDPE-clay nanocomposites by melt intercalation method. OMMT and MMT were added in a range of 1-5 wt %. Fourier transform infrared spectroscopy (FTIR) used to evaluate polymer structure before and after the fabrication. Thermogravimetric analysis (TGA) and Differential Scanning Calorimetry (DSC) were used to analyse the thermal stability and thermal properties for the wLDPE and fabricated nanocomposites. Tensile mechanical characteristics of the waste specimens before and after nanocomposite fabrication were evaluated. The FTIR exhibited no change in the chemical structure of the wLDPE used after clay addition. Melting temperature and crystallization percentage were increased up to 1 wt% loaded and decreased in with clay content increasing when compared to the original waste matrix. The thermal steadiness of the wLDPE /clay nanocomposites were found enhanced in the case of loading 3 wt% of OMMT. The elastic modulus has improved in the 3% OMMT loaded.