

Enhanced Thermal, Mechanical and Morphological Properties of CNT/HDPE Nanocomposite Using MMT as Secondary Filler

Authors : M. E. Ali Mohsin, Agus Arsad, Othman Y. Alothman

Abstract : This study explains the influence of secondary filler on the dispersion of carbon nanotube (CNT) reinforced high density polyethylene (HDPE) nanocomposites (CNT/HDPE). In order to understand the mixed-fillers system, Montmorillonite (MMT) was added to CNT/HDPE nanocomposites. It was followed by investigating their effect on the thermal, mechanical and morphological properties of the aforesaid nanocomposite. Incorporation of 3 wt% each of MMT into CNT/HDPE nanocomposite resulted to the increased values for the tensile and flexural strength, as compared to the pure HDPE matrix. The thermal analysis result showed improved thermal stability of the formulated nanocomposites. Transmission electron microscopy (TEM) images revealed that larger aggregates of CNTs were disappeared upon addition of these two components leading to the enhancement of thermo-mechanical properties for such composites.

Keywords : secondary filler, montmorillonite, carbon nanotube, nanocomposite

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