

The effect of various nanoclay surface modifications on the thermal and mechanical properties of amorphous polyamide nanocomposites

Abstract

The addition of nanoclay within polymer matrix is anticipated to enhance the properties of the polymer system. Nonetheless, one of the key elements in property enhancements of a polymer nanocomposites is the surface modifications of the nanoclay. This is due to the affinity between polymer matrix and nanoclay is of important factors should be considered. In this study, amorphous polyamide was melt blended with different nanoclay grades with different surface modifications in order to evaluate the best clay grade for the polymer system. The thermal analysis carried out on the amorphous polyamide nanocomposites were carried out by means of differential scanning calorimetry (DSC) and dynamic mechanical analysis (DMA) whereas the mechanical properties were investigated using tensile testing. It was observed that there were changes in the glass transition temperature (T_g) of the nanocomposites due to clay additions. Further, the storage modulus was found to increase as a result of nanoclay incorporation. The type of clay grades significantly affects the mechanical properties of the amorphous polyamide nanocomposites.

Keywords

Amorphous polyamide; Mechanical; Nanoclay; Nanocomposites; Thermal