

Mechanical and thermal properties of Nylon-6/LNR/MMT nanocomposites prepared through emulsion dispersion technique

ABSTRACT

In this research, nylon-6/liquid natural rubber/montmorillonite (nylon-6/LNR/MMT) nanocomposites were prepared through emulsion dispersion technique with contents of MMT from 2 to 10 wt.%. The mechanical, crystallographical, morphological, and thermal properties of the prepared nanocomposites were then characterised by using mechanical testers, XRD, TEM, DSC, and TGA. The mechanical test results showed that the tensile stress, tensile modulus, and impact strength of the nanocomposites improved with the incorporation of MMT. The XRD results displayed that there are no isotropic peaks were observed in the nanocomposites with 2, 4, and 6 wt.% of MMT. The TEM micrographs exhibited that the exfoliated state was achieved in the nanocomposites with less than 8 wt.% of MMT. The DSC and TGA results also indicated that the incorporation of MMT had increased the glass transition temperatures and degradation temperatures of the nanocomposites. In conclusion, the emulsion dispersion technique could prepare the nylon-6/LNR/MMT nanocomposites with improved mechanical and thermal properties.

Keyword: Nanocomposite; Emulsion dispersion; Nylon-6; Montmorillonite; Liquid natural rubber

