P-3-608

INFLUENCE OF THE PREPARATION METHOD ON THE THERMAL PROPERTIES OF PA6/COPOLYMER/ORGANOCLAY NANOCOMPOSITES

Pankaj Agrawal, Gustavo Brito, Carlos Cunha, Edcleide Araújo, Tomás Mélo,

Materials Engineering, Federal University of Campina Grande

pankaj@ig.com.br

The influence of the preparation method on the thermal properties of PA6/Copolymer/Organoclay nanocomposites was investigated. The materials used were PA6, EMA-GMA copolymer and Cloisite™ 20A organoclay. The nanocomposites were prepared in two steps: in the first step the organoclay was pre-intercalated into either PA6 or EMA-GMA terpolymer using an internal mixer at 50 rpm and 240ºC for 10 minutes, forming a concentrate. In the second step this concentrate was diluted into either PA6 or PA6/Copolymer blend in a twin screw extruder at 50 rpm and 240ºC. Samples were injection molded at 240ºC. The nanocomposites were characterized by X-Ray Diffraction (XRD), Thermogravimetry (TG), Differential Scanning Calorimetry (DSC) and Heat Distortion Temperature (HDT). XRD analysis results indicated that for PA6/EMA-GMA/Organoclay systems, nanocomposites with exfoliated structure were formed, regardless of the preparation method. It was also observed that for the PA6/EMA-GMA/Organoclay nanocomposite in which the clay was pre-intercalated into PA6, the presence of clay increased the intensity of the PA6 ? phase peak, indicating that the clay was located in the PA6 phase. DSC results indicated the presence of one endothermic peak at ~ 212ºC which was attributed to the PA6 ? phase and another at ~ 224ºC, which was attributed to the PA6 ? phase. For the same nanocomposite, in which the organoclay was pre-intercalated into EMA-GMA terpolymer, no increase on the PA6 ? phase intensity was observed, indicating that the clay was located in the EMA-GMA phase. DSC results showed only one endothermic peak at ~ 224ºC attributed to the PA6 ? phase. The absence of the ? phase peak was observed. TG and HDT results showed that the PA6/EMA-GMA/Organoclay nanocomposite in which the clay was pre-intercalated into EMA-GMA terpolymer presented higher thermal stability and lower HDT than the same nanocomposite in which the clay was pre-intercalated into PA6.