

Studying the Intercalation of Low Density Polyethylene/Clay Nanocomposites after Different UV Exposures

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Abstract : This study attempts to understand the effect of different UV irradiation methods on the intercalation of LDPE/MMT nanocomposites, and its molecular behavior at certain isothermal crystallization temperature. Three different methods of UV exposure were employed using single composition of LDPE/MMT nanocomposites. All samples were annealed for 5 hours at a crystallization temperature of 100°C. The crystallization temperature was chosen to be at large supercooling temperature to ensure quick and complete crystallization. The raw material of LDPE consisted of two stable monoclinic and orthorhombic phases according to XRD results. The thermal behavior of both phases acted differently when UV exposure method was changed. The monoclinic phase was more dependent on the method used compared to the orthorhombic phase. The intercalation of clay, as well as, the non-isothermal crystallization temperature, has also shown a clear dependency on the type of UV exposure. A third phase that is thermally less stable was also observed. Its respond to UV irradiation was greater since it contains low molecular weight entities which make it more vulnerable to any UV exposure.

Keywords : LDPE/MMt nanocomposites, crystallization, UV irradiation, intercalation

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