



EFFECT OF POLARITY OF THE ORGANOCCLAY ON THE MORPHOLOGY AND MECHANICAL PROPERTIES OF POLY (ACRYLONITRILE-BUTADIENE-STYRENE)/POLY (METHYL METHACRYLATE) BLENDS

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Study of polymer-blend nanocomposites has attracted great interest recently. Incorporation of a nanofiller, like organoclay, may increase the compatibility of the blend components by reducing the total free energy of mixing and preventing the coalescence of the dispersed domains. On the other hand, preferential location of nanoparticles changes the viscosity ratio of two polymers and may increase or decrease the dispersed phase size. It is clear that mechanical properties of the blend will affect by variation of the microstructure in presence of nanoclay platelets.

In this study, the effect of three types of commercial organoclays (OMMT), on the morphology, rheology and mechanical properties of poly (acrylonitrile-butadiene-styrene)/poly (methyl methacrylate) (ABS/PMMA) blends, have been investigated. Polymers were melt compounded with 2 and 4% wt of OMMTs using a lab scale twin-screw extruder. X-ray scattering and rheological measurements indicate that the polarity of the OMMT is more effective in intercalation and random distribution of nanofiller in the hybrid system. Scanning electron microscopy showed that the blends containing 2% wt of OMMT, presents finer dispersion of PMMA than both the pure blends and 4% wt OMMT filled hybrid systems. Also, the good dispersion of nanoplatelets through the matrix (ABS) and at the interface of ABS/PMMA leads to the best yield strength and toughness, however, the less polar OMMT enhances the stiffness of the hybrid nanocomposite.