PHYSICO-MECHANICAL AND THERMAL PROPERTIES OF MMT, ACRYLONITRILE BUTADIENE RUBBER AND ETHYLENE-METHYL ACRYLATE COPOLYMER NANOCOMPOSITES

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ABSTRACT

Acrylo-nitrile Butadi-ene Rubber (NBR), Ethylene-co=Methyl Acrylate polymer (EMA), Montmorillonite (MMT) nano-composites with all around exfoliated MMT layers have been set up by mechanical responsive melt blending. The d-separating of MMT brought up in the EMA/NBR nano-composites and the layers of MMT were scattered in the polymer lattice on a nano-meter scale. The TEM and XRD results demonstrated that homogeneous scattering of the mud mineral particles in the macromolecular chains. The incorporation of 3 phr of nano-clay into the EMA/NBR matrix structure detaching of nano-clay into the EMA/NBR matrix and boosting the stacking of nano-clay to 5 phr in the end prompts the intercalated/shed scattering of nano-clay into the EMA/NBR mix. Contrasted and the unadulterated EMA/NBR mix, the nano-composite showed a higher Tg. DMA study exhibited a perceptible improvement in the capacity modulus and subsequently an abatement in tan δ value in the wake of expanding nano-clay stacking in the EMA / NBR matrix. This shows an excellent dispersion and a higher fortification efficiency of the clay nano-filler in the macromolecular framework. Besides, the thermal stability of the EMA/NBR/MMT nano-composites improves with the expansion of nano-clay content up to 5 phr. The general physico-mechanical characteristics for these specific mixes have been improved due to the presence of nano-size intercalated clay particles in the macromolecular network. The EMA/NBR/MMT nanocomposites showed phenomenal swelling characteristic, which is ascribed to the great obstruction properties of nanoclay and its nano-scale scattering.

KEYWORDS: Nano Composites, Homogeneous Dispersion,Thermal Stability, Physico-Mechanical Characteristics