

The Thermal Properties of Nano Magnesium Hydroxide Blended with LDPE/EVA/Irganox1010 for Insulator Application

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Abstract : This paper illustrates the effect of nano Magnesium Hydroxide (MH) loading on the thermal properties of Low Density Polyethylene (LDPE)/ Poly (ethylene-co vinyl acetate)(EVA) nano composite. Thermal studies were conducted, as it understanding is vital for preliminary development of new polymeric systems. Thermal analysis of nano composite was conducted using thermo gravimetric analysis (TGA), and differential scanning calorimetry (DSC). Major finding of TGA indicated two main stages of degradation process found at $(350 \pm 25 \text{ oC})$ and $(480 \pm 25 \text{ oC})$ respectively. Nano metal filler expressed better fire resistance as it stand over high degree of temperature. Furthermore, DSC analysis provided a stable glass temperature around $51 (\pm 1 \text{ oC})$ and captured double melting point at $84 (\pm 2 \text{ oC})$ and $108 (\pm 2 \text{ oC})$. This binary melting point reflects the modification of nano filler to the polymer matrix forming melting crystals of folded and extended chain. The percent crystallinity of the samples grew vividly with increasing filler content. Overall, increasing the filler loading improved the degradation temperature and weight loss evidently and a better process and phase stability was captured in DSC.

Keywords : thermal properties, nano MH, nano particles, cable and wire, LDPE/EVA

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