

## **ABSTRACT OF PROJECT 1**

### **Polyamide 6/Organoclay Nanocomposites Synthesized by in situ Anionic Polymerization Using Rotational Moulding Process.**

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#### **Abstract**

In this work, a novel method using rotational moulding was developed for the preparation of exfoliated monomer casting polyamide 6/montmorillonite (PA6/NC) nanocomposites via insitu polymerization. The mechanical properties were studied through tensile, flexural, Izod impact and fracture toughness testing. The morphology, essentially comprised of the dispersion of MMT particles in the PA6 matrix, was characterized by scanning electron microscopy (SEM). Wide angle X-ray diffraction (XRD) was used to characterize the formation of the nanocomposites. The thermal properties were characterized by using differential scanning calorimeter (DSC) and thermogravimetry analysis (TGA). The dynamic mechanical were analyzed by using dynamic mechanical thermal analyzer (DMTA). The results indicated that nanoscale dispersed MMT was successfully achieved in the PA6 matrix. Furthermore, the addition of a small amount of MMT dramatically improved the thermal stability of PA6/NC. Analysis using differential scanning calorimetry (DSC) and XRD indicated that nanoscale dispersed MMT sheets acted as heterogeneous nucleation agents, which favored the formation of the  $\gamma$ -crystalline form of the PA6 /NC matrix.

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