

## Synthesis and characterization of PMMA/clay nanocomposites via *in situ* intercalative solution polymerization

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Polymethyl methacrylate (PMMA)/clay nanocomposites were prepared by *in situ* intercalative polymerization initiated with Nickel (II) acetylacetonate [Ni(acac)<sub>2</sub>] and methylalumoxane (MAO) catalyst. The products were characterized by FT-IR, X-ray diffraction, TGA, DSC and dynamic mechanical analysis. Structure investigation indicated the nanocomposites possessed exfoliated structure, in which the silicate layers were exfoliated into nanometer secondary particles and dispersed in the PMMA matrix. In comparison with pure PMMA, the thermal stability, glass transition temperature, and mechanical properties of the polymer were significantly improved by the presence of the nanometric silicate layers. For the exfoliated PMMA/clay nanocomposites, 5 ~10 °C increases in T<sub>g</sub> and up to 50 °C increases in decomposition temperatures were observed. The unique properties of the nanocomposites result from the strong interactions between the silicate layers and the PMMA chains.