

P-3-03

Preparation and Characterization of Transparent Polyimide Nanocomposite Films

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Nanocomposite is the multi-component materials in nano-scale by chemical or physical hybridization of different kinds of materials in order to overcome the limit of the properties of the conventional composite. However, in many cases, thermal fragile nano-sized fillers are not completely dispersed throughout the polymers, and this lead to loss of optical property as well as mechanical properties. Therefore, new type of organophilic layered silicate are needed to settle dispersion and thermal stability. The dispersion of clay plays an important role in optical property of transparent polymer. From a light scattering point of view, haze corresponds to larger scattering angles than loss of clarity. Therefore, both bulk inhomogeneties and surface roughness may contribute to haze. For the thermal stability of the various organoclays, we have choose the oligo(amic acid)s having various chemical structure as organophilic modifiers.

In the present study, we prepared heat resistant organophilic layered silicates based on oligomeric amic acid, and investigated thermal characteristics of different types of OLS. And also novel polyimide nanocomposites with high transparency have been manufactured *via* solution blending. The work presented herein is focused on developing a method to prepare well-dispersed PI/synthetic smectite nanocomposites and characterization of their morphologies by XRD and TEM. And also, we examine their optical, thermal and dynamic mechanical properties.

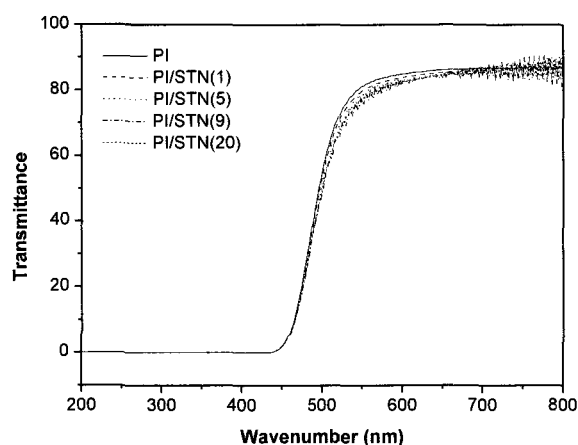


Figure 1. UV spectra of PI/synthetic smectite nanocomposite films

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