

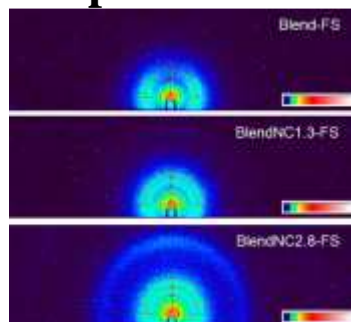
Determination of structural changes of dispersed clay platelets in a polymer blend during solid-state rheological property measurement by small-angle X-ray scattering

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Abstract

The poly(ethylene terephthalate)/thermotropic liquid crystal polymer (weight ratio 80:20) blend composites with two different weight percentages of nanoclay were prepared using a twin-screw extruder. The frequency sweep experiments at a constant strain and different temperatures were carried out by a dynamic mechanical analyzer. The temperature sweep experiments of unmodified and nanoclay modified blends were conducted to find out the variation of flexural storage and $\tan \delta$ values as a function of temperature. Results showed that the modulus of the blend increases after composite formation with nanoclay and the variation of frequencies during temperature sweep experiments do not affect the glass transition temperature values. The small-angle X-ray scattering studies showed that the degree of anisotropy and mean orientation angles of clay platelets in blend matrix were altered significantly after frequency and temperature sweep tests.

Graphical abstract



Keywords

- Blend composites;
- Small-angle X-ray scattering;
- Solid-state rheology