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Flame retardancy of polystyrene/nylon-6 blends with dispersion of clay at the interface

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ABSTRACT

Ammonium polyphosphate (APP) and clay were utilized to flame-retard polystyrene/nylon-6 (PS/PA6) blends. The results of FTIR spectra and transmission electron microscopy (TEM) indicated that APP and clay were exclusively dispersed in the PA6 phase. Selective localization of clay at the interface of polymer blends was achieved by the method that poly(styrene-co-maleic anhydride) (SMA) was first reacted with clay, and then blended with PA6/PS. The influences of the distribution of clay and the morphology of PS/PA6 blends on flame retardancy were investigated. The flame retardancy was evaluated by limiting oxygen index (LOI), vertical flammability test, and cone calorimeter tests. For blends with a dispersed PA6 phase, the dispersion of clay in blends has an insignificant effect on the flame retardancy. However, in blends with a continuous PA6 phase, the flame retardancy of blends with clay dispersed at the interface was better than that of blends with clay dispersed in PA6 phase. An investigation of thermo-gravimetric (TG) analysis revealed that the thermal

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