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Influence on Thermal Diffusivity through a Transformation of Nanotube-like Clay Platelets in Polymer Blends SEONGCHAN PACK, TAKASHI KASHIWAGI, TADANORI KOGA, JONATHAN SOKOLOV, MIRIAM RAFAILOVICH, Department of Materials Science and Engineering, Stony Brook University — We have previously demonstrated that large aspect ratio nanoparticles such as clays or nanotubes can form in-situ grafts which become universal compatiblizing agents for polymer blends. Here we show how the same mechanism could be applied to producing flame retardant materials in the polymer matrix. In particular, the large aspect nanoclays prevent thermally induced phase segregation and disperse the flame retardants, which greatly decrease flammability and increase efficiency of the flame retardants during combustion due to a formation of ribbons-like structures. These structures could produce a lager thermal differential gradient between the two polymer phases, which could change a heat specific of the system during combustion. Therefore, a small addition of the nanoclays affects the huge reduction on heat release rate and the mass loss rates. Furthermore, using a small angle X-ray scattering (SAXS), a transmission electron microscopy (TEM), and a scanning electron microscopy (SEM) shows that the clay platelets could be transformed into tubular-like rods during combustion, which would increase of the thermal diffusivity in the polymer blend.

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