

Morphology and Rheological Behavior of Polypropylene / ATH / Organoclay Blends

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ABSTRACT

The organoclay is an emerging substitute for aluminum trihydroxide in flame retardant polypropylene/ aluminum trihydroxide (PP/ ATH) composites. The efficiency of a novel metallocene catalyzed alcohol-co-polypropylene (PP-co-OH) as a compatibilizer for PP filled with ATH and organoclay was investigated. To provide a reference point, a commercial maleic anhydride grafted polypropylene (PP-g-MAH) com-patibilizer was used. Also, the effect of stearic acid treatment on the ATH was looked into. The series of PP/ ATH

/organoclay nanocomposites was prepared by melt blending. The processability properties were determined using a stress rheometer and the morphology was assessed with a scanning electron microscope (SEM). The processability of the melt was improved by using the organoclay with the PP-co-OH compatibilizer instead of the PP-g-MAH. Also, the elasticity of the melt was higher with the addition of PP-co-OH than PP-g-MAH suggesting a lower surface tension of the organoclay and the ATH to the matrix polypropylene. Stearic acid treatment on the ATH enhanced the compatibility further.