

Abstract Submitted
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PP/POSS Nanocomposites: Characterization and Properties of Melt Spun Fibers¹ BYOUNG-JO LEE, SAYANTAN ROY, SADHAN JANA, University of Akron — It is known that molecules of polyhedral oligomeric silsesquioxane (POSS) can self-assemble into spherical, fibrillar, or lamellar nanoparticles by bottom-up self assembly process during mixing with host polymers. This study capitalizes on such nanoparticle formation to increase the melt strength and tensile properties of polyolefin blown films and spun fibers. A novel method was developed whereby a sorbitol-type nucleating agent was used as dispersion aids for POSS. The nucleating agent also served as templates for self-assembly of POSS molecules into nanoparticles of 25-200 nm in diameter. A typical polypropylene formulation containing 0.3 wt% nucleating agent and 5-10 wt% POSS was spun into fibers with close to 70% reduction in diameter and 40-45% increase in modulus and 70-75% increase in yield strength compared to unfilled PP. An optimum concentration of POSS was identified.

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