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Preparation and properties of nanosilica-filled polypropylene composites with PP-methyl POSS as compatibiliser

Abstract

Nanosilica-filled polypropylene composites, containing 1, 2, 3, 4 and 5 wt% of fumed silica nanoparticles were prepared using a thermo Haake internal mixer. Polypropylene-methyl polyhedral oligomeric silsesquioxane (PP-methyl POSS) was introduced into the system as a compatibiliser. The composites were characterized by performing tensile and impact testing as well as SEM analysis. From the mechanical test results, it was found that PP-methyl POSS was effectively enhanced the tensile properties of the composites at lower nanosilica content. The enhancement of the properties of nanosilica-filled polypropylene composites was attributed to a better dispersion of nanosilica and increased compatibility between silica and polypropylene matrix with the presence of PP-methyl POSS as compatibiliser.

Keywords — Mechanical properties, nanosilica-filled polypropylene, PP-methyl POSS