

Preparation of nanocomposites based on styrene/(p-methylstyrene) and SiO₂ nanoparticles, through a metallocene/MAO initiating system

Zapata, Paula A.

Zamora, Paulina

Canales, Daniel A.

Quijada, Raúl

Benavente, Rosario

Rabagliati, Franco M.

© 2018, Springer-Verlag GmbH Germany, part of Springer Nature. The preparation of nanocomposites, including styrene, tertbutylstyrene, and SiO₂ nanoparticles, in toluene solution was attempted by in situ polymerization using a cyclopentadienyltitaniumtrichloride/methylaluminoxane, CpTiCl₃/MAO, initiator system. SiO₂ nanospheres (ca. 20 nm in diameter) were synthesized by the sol-gel method. The nanoparticles' surface was modified with hexadecyltrimethoxysilane (Mod-SiO₂Nps) in order to improve the interactions with the polymer. The polymerization activity increased as the proportion of p-methyl styrene was increased in the initial feed. With respect to the effect of the incorporation of nanoparticles in the reactions, the catalytic activity increased slightly in the presence of 5 wt% of nanospheres compared to neat copolymerization without any nanoparticles. Our studies achieved a convenient route through in situ polymerization, avoiding further treatment of the nanocomposite. The ther