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In Situ Synthesis of A(3)-Type Star Polymer/Clay Nanocomposites by Atom Transfer Radical Polymerization

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Abstract

A series of A(3)-type star poly(methylmethacrylate)/clay nanocomposites is prepared by in situ atom transfer radical polymerization (ATRP) initiated from organomodified montmorillonite containing quaternary trifunctional ATRP initiator. The first order kinetic plot shows a linear behavior, indicating the controlled character of the polymerization. The resulting nanocomposites are characterized by spectroscopic (XRD), thermal (DSC and TGA), and microscopic (TEM) analyses. The exfoliated nanocomposite has been obtained when polymerization was conducted with 1% of organic clay loading. Thermal analyses show that all nanocomposites have higher glass transition values and thermal stabilities compared to neat polymer. (c) 2013 Wiley Periodicals, Inc.

Keywords

Author Keywords: atom transfer radical polymerization; in situ polymerization; nanoclay; nanocomposites; star polymers

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