Synthesis of Magnetite-Block Copolymer Nanoparticle Composites

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Magnetite and block polymer (PHEMA-b-PMMA) nanocomposite was synthesized by ATRP in an ionic liquid. Magnetite nanoparticles were firstly surface-modified with an initiator under DMF (dimethylformamide) solvent, which produced the macro-initiator Fe_3O_4–init which initiated the polymerization for synthesis of block polymer. After immobilization of the initiator on surface of Fe_3O_4, block polymer chains were grafted successfully onto the surface of Fe_3O_4, causing to the formation of core-shell nanostructure. The incorporation of Fe_3O_4 in the nano-composite was confirmed by FT-IR, XRD, TEM, NMR and XPS. This method can provide a green synthetic route that has advantages over conventional methods, such as easy separation, fast removal, and convenient recovery of solvent.

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