

Preparation and Application of Poly [acrylonitrile-co-(itaconic acid)-co-(methyl acrylate)] / Magnetite Nanofiber Membrane via Electrospinning for Adsorption of Pb²⁺ Ions from Aqueous Solution

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Extended Abstract

Poly [acrylonitrile-co-(itaconic acid)-co-(methyl acrylate)] was synthesised by emulsion polymerization method. Magnetite nanoparticle functionalized with 3-aminopropyl trimethoxysilane by co-precipitation process of Fe⁺³/Fe⁺² in the presence of 3-aminopropyl trimethoxysilane. Magnetic nanoparticles were incorporated into polymeric solution via heat treatment. The polymer with magnetite nanoparticle membranes was fabricated by a one-step electrospinning method. The membranes were characterized by scanning electron microscopy (SEM) and Fourier-transform infrared spectroscopy (FT-IR). Magnetite immobilized Poly [acrylonitrile-co-(itaconic acid)-co-(methyl acrylate)] membranes exhibited very high adsorptions properties on the adsorption of Pb²⁺ from an aqueous solution. Equilibrium adsorption was achieved after 30 min and more than 98% of Pb²⁺ ions in the solution were removed. The membrane could be regenerated through passing 0.1 N HCl.