

عنوان مقاله:

Investigation of PVA coated nanocomposite membrane performance for removal of toxic metal ions from aqueous solutions

محل انتشار:

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خلاصه مقاله:

Recently, membrane adsorption has appeared as an applicable technique for removal of heavy metal ions from aqueous solutions. Compared to the conventional methods for separation of heavy metals e.g. ion exchange, chemical precipitation and adsorption columns, adsorptive membranes present several advantages such as higher flow rate, excellent removal efficiency, lower pressure drop, reusability, faster kinetic and facility of scale up. In this study, a series of nanocomposite membranes was fabricated by coating a porous polyvinylidene fluoride / polyethersulfone support containing a complexing agent with PVA/Fe₃O₄ nanocomposite solution. Nanocomposite solutions were prepared via in-situ formation of magnetite nanoparticles in a polymeric solution containing PVA by a simple chemical method. The prepared membranes were applied for removal of Pb(II) and Zn(II) ions from water. The effects of membrane modification, filler loadings and initial feed concentration on the membranes performance for removal of metal ions were investigated. The results indicated that presence of complexing agent and magnetite nanoparticles in the membrane structure enhanced the ions rejection. The prepared samples were characterized by several techniques including scanning electron microscopy, Fourier transform infrared spectroscopy, X-ray diffraction, overall porosity and water contact angle measurements. SEM images indicated appropriate distribution of nanoparticles in the polymeric matrix. Sequential filtration/regeneration experiments confirmed that the modified membranes can be readily regenerated and reused.

کلمات کلیدی:

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