

Removal of Ag⁺, Co⁺⁺ and Cs⁺ From Wastewater Using Porous Resin Blend (Epoxy/PVA)

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Abstract :

In this study, removal of silver, cobalt and cesium from aqueous solutions under different experimental conditions using a prepared porous resin blend (Epoxy/Polyvinyl alcohol) was investigated. Blending of Epoxy with PVA and thereafter foaming in a viscous state were carried out to attain the optimum hydrophilicity. Gamma rays were used in the preparation process to control the granular size and the compatibility of the blend. Characterization of the blend after milling was reported using thermogravimetric analysis (TGA), Fourier transform infra red (FTIR) and scan electron microscopy (SEM). The adsorption of Ag(I), Co(II) and Cs(I) ions from aqueous solution by the prepared porous resin blend was examined by batch equilibration technique. The effects of initial ion concentration, temperature, pH and shaking time on the adsorption of metal ions were investigated. The adsorption amount of ions increased with the increase of shaking time, temperature, metal ion concentration and pH of the media. The results showed that metal ion adsorption followed the order Ag⁺>Co⁺⁺>Cs⁺. The amount of metal ion adsorbed at equilibrium for Ag⁺, Co⁺⁺ and Cs⁺ at pH 5 was 9.8, 9.4 and 9.1 mg/g. It was found that the adsorption isotherm of the ions fitted Langmuir isotherms

Key Word :

Blend, γ - irradiation, metal ion, porous resin, adsorption, contaminated water

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