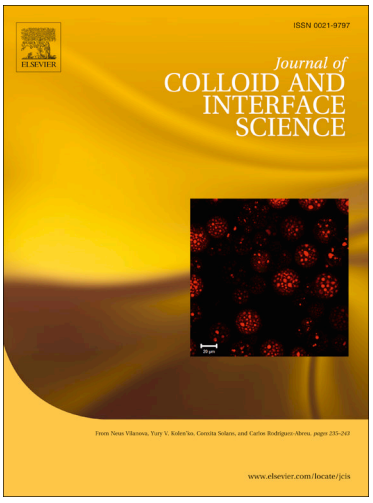

Regular Article

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Preparation of ruthenium (III) ion-imprinted beads based on 2-pyridylthiourea modified chitosan

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Abstract

Ru(III) ion-imprinted bio-adsorbent based on 2-pyridylthiourea modified chitosan (Ru-PTCS) had been manufactured, investigated and employed for selective extraction of Ru(III) ions from aqueous medium containing interfering metal ions that maybe coexist and compete with Ru(III) ions. Elemental analysis, FTIR and NMR techniques were performed to characterize the chemical structure of the synthesized polymeric materials. The optimum extraction conditions, selectivity and regeneration efficiency were evaluated via batch experiments. The maximum adsorption was obtained at pH 4, and the extraction kinetics followed the pseudo-second order model. Also, the equilibrium isotherms were in accordance with Langmuir model and the maximum adsorption capacity was 249±1 mg/g. The prepared Ru-PTCS exhibited a high affinity toward the targeted Ru(III) ions even in multi-ionic media containing other similar competitive metal ions. In addition, the polymeric selective bio-adsorbent maintained about 96% of its efficiency after 8 adsorption/desorption cycles.

Keywords:
Chitosan
2-pyridylthiourea
Ruthenium ion
Ion-imprinting

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