

化学

铀酰离子印迹聚合物的合成及在分析中的应用

肖静水¹; 刘慧君^{1, *}; 肖锡林¹; 黄生力²

1. 南华大学化学化工学院, 湖南衡阳421001; 2. 核工业天水地质矿产分析测试中心, 甘肃天水741000

收稿日期 修回日期 网络版发布日期:

摘要 以 UO_2^{2+} 为印迹离子, 偶氮二异丁腈(AIBN)为引发剂, 邻苯二酚- UO_2^{2+} -4-乙烯基吡啶三元配合物为模板, 与苯乙烯单体、交联剂二乙烯基苯在甲醇溶液中通过共聚反应制备了 UO_2^{2+} 印迹聚合物微球。该印迹聚合物微球经6 mol/L HCl处理后留下与铀酰离子大小相匹配的空穴, 对水溶液中微量铀有富集作用, 在 $\text{pH}=5\sim 7$ 及吸附时间在20 min以上时, 该印迹聚合物微球对水溶液中微量铀的吸附率可达99%以上, 且具有良好的选择性; HCl浓度在1.0 mol/L以上, 淋洗体积为聚合物体积的5倍以上, 淋洗时间在20 min以上时洗脱率可达99%以上。将其应用于卤水中微量铀的测定, 与标准方法相比较, 所得结果令人满意。

关键词 [铀酰离子](#) [三元配合物](#) [印迹聚合物](#) [卤水](#)

分类号

Synthesis of Uranyl Ion Imprinted Polymer and Its Application In Analysis

XIAO Jing-shui¹; LIU Hui -jun^{1, *}; XIAO Xi -lin¹; HUANG Sheng-li²

1. Chemistry & Chemical Engineering College, University of South China, Hengyang 421001, China; 2. Tianshui Analytical Center for Geology & Mineral, CNNC, Tianshui 741000, China

Abstract Uranyl ion imprinted polymer beads were prepared by the copolymerization of styrene monomer and divinyl benzene as crosslinking agent in methanol solution, with the UO_2^{2+} -o-dihydroxybenzene -4-vinyl pyridine ternary complex as template, the 2,2'-azo-bis-isobutyronitrile as initiator and UO_2^{2+} as the imprinting ion. The uranyl ions were removed from the polymer beads by treating with 6 mol/L HCl, leaving behind cavities that match uranyl ion in size. The treated polymer beads can preconcentrate uranyl ions from dilute aqueous solutions. The adsorption efficiency can reach 99% or above with good selectivity when pH is in the range of 5-7 and the adsorption time is more than 20 min. The elution rate can reach above 99% under the conditions of concentration of HCl being above 1.0 mol/L, elution time more than 20 min and the elution volume more than 5 times the volume of ion imprinted polymer. The uranyl ion imprinted polymer beads have been successfully applied to determine micro-uranium in brine samples. The results are satisfactory compared with NBS method.

Key words [uranyl ion](#) [ternary complex ion](#) [imprinting polymer](#) [brine](#)

DOI

扩展功能

本文信息

▶ [Supporting info](#)

▶ [\[PDF全文\]\(385KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

相关信息

▶ [本刊中包含“铀酰离子”的相关文章](#)

▶ 本文作者相关文章

- [肖静水](#)
- [刘慧君](#)
- [肖锡林](#)
- [黄生力](#)