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硅胶吸附去除高放废液中的锆

刘学刚[1]，梁俊福[1]，徐景明[1]，樊小强[2]

1. 清华大学 核能与新能源技术研究院，北京 102201
2. 兰州核燃料厂，甘肃 兰州 732850

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摘要 实验研究硅胶对硝酸体系中Zr、Pu(Ⅳ)的静态吸附和动态吸附行为。在1.0～4.0 mol/L HNO_3中，硅胶对Zr的静态吸附容量(以干硅胶计)约为20 mg/g，对Pu(Ⅳ)的吸附分配系数为0.7～1.4 mL/g。随着料 液酸度的降低，硅胶对Zr、Pu的吸附增加。动态吸附实验结果表明，进料酸度为2.0 mol/L HNO_3时，硅胶吸附柱的工作容量约为3.5倍柱体积。使用2 mol/L HNO_3淋洗液可将吸附Zr、Pu后的硅胶柱中的部分Zr、Pu洗脱，但洗脱不完全。用2倍柱体积的0.2 mol/L $H_2C_2O_4$可将硅胶吸附的Zr、Pu解吸下来。硅胶柱用0.2 mol/L $H_2C_2O_4$解吸后复用6次，Zr的穿透曲线位置相同。

关键词 硅胶 高放废液 Pu(Ⅳ) Zr 吸附

分类号

Removal of Zirconium From High-Level Liquid Waste by Silica Gel Absorption

LIU Xue-gang[1], LIANG Jun-fu[1], XU Jing-ming[1], FAN Xiao-qiang[2]

1. Institute of Nuclear and New Energy Technology, Tsinghua University, Beijing 102201, China; 2. Lanzhou Nuclear Fuel Plant, Lanzhou 732850, China

Abstract The static and dynamic adsorption behaviors of zirconium and plutonium(Ⅳ) on silica gel were studied. In 1.0-4.0 mol/L HNO_3 solution, the static capacity of Zr on silica gel is about 20 mg/g, and the adsorption distribution coefficient of Pu(Ⅳ) is 0.7-1.4 mL/g. The adsorption of Zr and Pu increases with the decrease of aqueous acidity. The results of dynamic adsorption show that the effective capacity of dynamic adsorption for silica gel column is 3.5 times of bed volume. Zr and Pu absorbed in column can be partly eluted by 2 mol/L HNO_3. 0.2 mol/L H_2C_2O4 can be used to elute Zr and Pu completely. The silica gel column eluted by 0.2 mol/L $H_2C_2O_4$ can be reused six times and the position of dynamic adsorption curve of each time is the same.

Key words silica gel high level liquid waste Pu(Ⅳ) Zr adsorption

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