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用恒电位库仑法精确测定四水硫酸钚中的钚含量

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摘要 将四水硫酸钚溶于2.5mol/l硝酸。用1 mol/l硝酸为测定介质,以黄金网为工作电极,在0.455V(SCE)将Pu(Ⅳ)还原为Pu(Ⅲ)后,在0.895V(SCE)将Pu(Ⅲ)氧化为Pu(Ⅳ),由数字库仑计显示氧化电量。对电量进行空白和反应份数的校正后,按法拉第定律精确地计算出被测钚量。电解池中钚量约为5mg。在此水平上,相对标准偏差为0.046%。

关键词 四水硫酸钚 恒电位库仑 标准物质

分类号

ACCURATE DETERMINATION OF PLUTONIUM CONTENT IN PLUTONIUM SULFATE TETRAHYDRATE BY CONTROLLED POTENTIAL COULOMETRY

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Abstract The accurate determination of Pu content in plutonium sulfate tetrahydrate by controlled potential coulometry is described. The plutonium sulfate tetrahydrate is dissolved in 2.5 mol/l HNO_3. A solution of l mol/l nitric acid is used as the electrolyte and netted gold as the working electrode. The Pu (Ⅳ) is reduced to Pu (Ⅲ) by maintaining the control potential at 0. 455 V (SCE), and then oxidation of Pu (Ⅲ) to Pu (Ⅳ) is accomplished by maintaining the control potential at 0.895 V (SCE) until the cell current level dropped down to less 20 μA. The amount of plutonium to be assaied is about 6 mg and the method shows a precision of 0.046% relative standard deviation, RSD, with no significant bias.

Key words Plutonium sulfate tetrahydrateStandard substanceControlled potential couloetry.

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