

物理

一种测量²⁴¹Am溶液比活度的方法

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摘要 根据符合法原理, 利用 $4\pi\alpha+4\pi\gamma$ 活度测量标准装置, 采用改变 γ 探测效率的方法, 外推测量²⁴¹Am溶液的比活度, 解决了电离室测量 α 源时需进行的自吸收和反散射系数校正问题。双 4π - γ 效率外推法通过调整测量装置升降机高度来改变NaI(Tl)探测器对放射源所张的立体角, 从而达到改变 γ 探测效率的目的, 进而通过 γ 效率拟合外推得到放射源的活度。经过对两种²⁴¹Am溶液20多个源的测量, 测量结果与 $2\pi\alpha$ 屏栅电离室活度测量结果在不确定度范围内符合一致, 且其测量不确定度降到了0.4%以内。

关键词 [²⁴¹Am](#) [\$\gamma\$ 效率外推](#) [比活度](#)

分类号

A Method for Specific Activity Measurement of ²⁴¹Am Solution

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Abstract

According to the principle of coincidence theory, the specific activity of ²⁴¹Am solution was determined on $4\pi\alpha+4\pi\gamma$ counting standard device by γ efficiency extrapolation, and the problems of constant correction coefficients of self-absorption and scattering in α ionization chamber method were solved. The method was based on the alteration of detection efficiency when the height of elevator was altered, and the activity was obtained by γ fitting extrapolation according to detection efficiency. The results of more than 20 alpha radioactive sources by this method in our work are accordant with those of $2\pi\alpha$ ionization chamber, and their uncertainties are improved to 0.4%.

Key words [²⁴¹Am](#) [\$\gamma\$ efficiency](#) [extrapolation](#) [specific activity](#)

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