

技术及应用

## 氡子体连续测量仪的研制

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**摘要** 本工作研制氡子体连续测量仪。仪器由泵主动采样, 滤膜收集氡子体, 采用半导体探测器测量 $\alpha$ 辐射, 二道能谱法测量 $\alpha$ 计数, 使用扣除算法计算氡子体潜能浓度, 通过测量 $^{212}\text{Po}$ 的8.78 MeV $\alpha$ 计数消除 $^{220}\text{Rn}$ 对氡子体的测量干扰。仪器可在不更换滤膜情况下连续测量, 测量周期可选择1、1.5、2和3 h。采用MCS51单片机控制自动采样、测量和计算。测量范围为0.001 5~100  $\mu\text{J}\cdot\text{m}^{-3}$ , 测量值大于0.1  $\mu\text{J}\cdot\text{m}^{-3}$ 时的测量不确定度小于10%。

**关键词** [氡子体](#) [扣除算法](#) [连续测量](#)

分类号 [TL81](#)

## Development of a Radon Progeny Continuous Monitor

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**Abstract** A radon progeny continuous monitor was developed. The pump was used for sampling, and radon progeny was collected by filter membrane. The alpha radiation was detected by semiconductor detector, and the pulse was measured by two channel pulse-height analyzer. The potential energy concentration of radon progeny was calculated through deduction arithmetic, eliminating the effects of  $^{220}\text{Rn}$  by measuring alpha counting of  $^{212}\text{Po}$  (8.78 MeV). The monitor can continuously work without replacing filter membrane. The measurement cycles can be selected in four modes: 1, 1.5, 2 and 3 h. Microprocessor MCS51 was used for auto-sampling, measurement and calculation. The measurement range is 0.001 5-100  $\mu\text{J}\cdot\text{m}^{-3}$ . The uncertainty is less than 10% when the measurement value is larger than 0.1  $\mu\text{J}\cdot\text{m}^{-3}$ .

### Key words

DOI

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### 扩展功能

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