

FD220

氡钍分析仪
Radon and Thoron Analyzer

应用领域

适用于地质找矿，辐射防护，核事故监测，辐射剂量评价，地震预报及院校教学等领域。

可用于测定水、岩石、土壤等样品中放射性元素“镭、钍”的活度，亦可用于测定大气、室内环境及矿山坑道中氡射气浓度。

符合的标准/规程

- GB 11214-1989《水中镭-226的分析测定》
- GB 50325-2020《民用建筑工程室内环境污染控制标准》
- GB/T 5750.13-2023《生活饮用水标准检验方法 第13部分:放射性指标》
- GB 5749-2022《生活饮用水卫生标准》
- GB 8538-2016《食品安全国家标准 饮用天然矿泉水检验方法》
- GB/T 13073-2010《岩石样品226Ra的测定 射气法》
- GBZ/T 155-2002《空气中氡浓度的闪烁瓶测定方法》
- DZ/T 0064.75-2021《地下水水质分析方法 第75部分:镭和氡放射性的测定射气法》

Application Fields

Applied in geological prospecting, radiation protection, nuclear accident monitoring, radiation dose assessment, earthquake prediction and teaching, etc.

It can be used to determine the activity of the radioactive element radium in water, rock, soil and other samples, and measure radon concentration in the ambient air, indoor environment and mine tunnel.

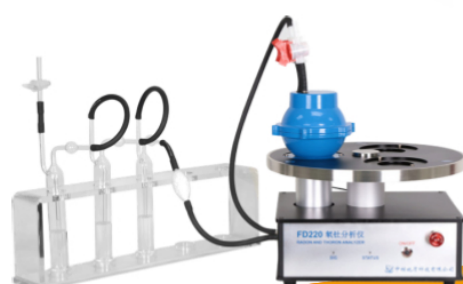
The instrument meets the requirements of GB 11214-1989, GB 50325-2020, GB/T 5750.13-2023, GB 5749-2022, GB 8538-2016, GB/T 13073-2010, GBZ/T 155-2002, and DZ/T 0064.75-2021.



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氡钍分析仪
Radon and Thoron Analyzer

仪器特点

- 包含氡(^{222}Rn)、钍(^{230}Rn)射气测量方法及数据分析
- 钍(^{230}Rn)射气测量恒流采样，气体取样速率精确，气路状态实时监测与报警
- 采用球形ZnS(Ag)闪烁室，灵敏度高
- 机电一体化设计，可实现样品连续自动测量，大幅提升工作效率
- 软件设计集测量控制、数据分析及存储等功能于一体，以图谱形式实时显示计数率
- 测量结果以Excel表格形式存储，方便查阅、打印并且可直接用于报告发布
- 体积小，重量轻，移动方便
- 整机功耗低，可选配锂离子充电电池

技术指标

1. 灵敏度
氡: ≥ 110 cpm/Bq
钍: ≥ 22 cpm/Bq
2. 本底计数率: ≤ 2.5 cpm
3. 计数容量: $1 \sim 2^{32}$ 个脉冲
4. 测量重复性误差: $\leq 2.7\%$
(使用表面粒子数 $8000/2\pi \cdot \text{min}^{-1}$ ^{241}Am 表面源)
5. 准确度
氡: ≥ 37 Bq/g 最大允许误差 $\pm 5\%$
 ≥ 3.7 Bq/g 最大允许误差 $\pm 15\%$
钍: ≥ 40.58 Bq/g 最大允许误差 $\pm 8\%$
 ≥ 4.058 Bq/g 最大允许误差 $\pm 13\%$
6. 检出限:
氡: 0.01 Bq (5min)
钍: 0.05 Bq (5min)
7. 稳定性: $\leq 2.7\%$
(8h, 使用表面粒子数 $8000/2\pi \cdot \text{min}^{-1}$ ^{241}Am 表面源)
8. 工作模式
氡: 单点或连续测量; 钍: 单点测量
9. 电源: 交流电/锂离子充电电池(选配), 电池供电可连续工作48h以上
10. 工作环境:
温度: $(-10 \sim +50)^\circ\text{C}$
相对湿度: $\leq 90\%$ ($+40^\circ\text{C}$)
11. 外形尺寸和重量
主机: $(310 \times 250 \times 213)\text{mm}$ 11.0 kg

仪器认证

中国计量科学研究院检定并出具检定证书

Instrument Characteristics

- Measurement methods for radon (^{222}Rn) and thoron (^{230}Rn).
- Measurement of thoron (^{230}Rn) gas through constant flow sampling with accurate gas sampling rates.
- Real-time monitoring and alarms of the gas path status.
- ZnS(Ag) scintillation chamber with high sensitivity.
- Mechanical and electrical integrated design, which can achieve continuous automatic measurement of samples.
- Operating software integrated with measuring, control, data analysis and storage function can display the counting rate in real-time in a graphical format.
- The results are stored in excel for easy access and printing.
- Low power consumption. Lithium-ion rechargeable battery can be optionally equipped.

Specifications

1. Sensitivity:
Radon ≥ 110 cpm/Bq Thoron ≥ 22 cpm/Bq
2. Background count rate: ≤ 2.5 cpm
3. Counting capacity: $1 \sim 2^{32}$ pulses
4. Repeatability: $\text{RSD} \leq 2.7\%$
(^{241}Am with the surface number of particles of $8000/2\pi \cdot \text{min}^{-1}$)
5. Accuracy:
Radon: ≥ 37 Bq/g MPE: $\pm 5\%$
 ≥ 3.7 Bq/g MPE: $\pm 15\%$
Thoron: ≥ 40.58 Bq/g MPE: $\pm 8\%$
 ≥ 4.058 Bq/g MPE: $\pm 13\%$
6. Detection Limit:
Radon: 0.01 Bq (5min) Thoron: 0.05 Bq (5min)
7. Stability: $\text{RE} \leq 2.7\%$ (8h)
(^{241}Am with the surface number of Particles of $8000/2\pi \cdot \text{min}^{-1}$)
8. Operating Mode:
Radon: single point, continuous measurement
Thoron: single point measurement
9. Power Consumption:
12V power supply
Li-ion rechargeable battery (optional), continuous operation for more than 48 hours.
10. Operating Environment
Temperature: $(-10 \sim +50)^\circ\text{C}$
Relative Humidity: $\leq 90\%$ ($+40^\circ\text{C}$)
11. Dimensions and Weight:
Host: $(310 \times 250 \times 213)$ mm 11.0 kg

Instrument Certification

Verified and certified by National Institute of Metrology P.R.China (NIM).



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