

# TRITIUM AND CARBON 14 IN AIR SAMPLE COLLECTING SYSTEM

## 氚和碳-14 空气样品收集系统

A COMPLETELY SELF CONTAINED PASSIVE SAMPLE COLLECTOR FOR AIRBORNE RADIOACTIVE MATERIAL

一套完善的采集气溶胶辐射物质的被动采样器

TRITIUM IN AIR SAMPLE COLLECTING SYSTEM FOR MEASUREMENT TO  $10^{-9}$  Ci/m<sup>3</sup> OR LOWER

氚空气样品收集系统，用于测量到  $10^{-9}$  Ci/m<sup>3</sup> 或更低

The TASC is a small self-contained unit which serves to collect samples from stacks, hoods, room air, the outside environment or other areas.

TASC 是一款小巧一体机，用来收集烟囱道、车厢、房间等地方空气，或户外空气。

### METHOD OF OPERATION AND USE

操作及使用方法

The radioactive material is continuously collected and concentrated in small vials. The amount trapped increases linearly with elapsed time. At regular intervals, the contents are assayed using (liquid) scintillation counters.

持续收集的辐射物质被集中在小玻璃瓶中，收集量随时间线性增加。每隔一定间隔，使用液体闪烁计数器检验。



Knowing the collector flow rate, and the results of the scintillation assay, it is easy to deduce the average sample activity over the period of time over which the sample was collected.

知道了收集器的流量和闪烁计算分析结果，很容易根据某段时间内收集的样品推断出平均样品活动。

### RADIOISOTOPES, TRITIUM, CARBON 14 OR OTHER

放射性同位素，氚，碳-14 及其它

Separated HT and HTO collectors are provided for discriminating tritium measurement. The HTO (T<sub>2</sub>O) is directly trapped in a double set of vials. While the HT fraction of airborne tritium is trapped in a second set of vials by converting the HT (T<sub>2</sub>) into the oxide by means of a small low temperature catalytic oxidizer.

采用独立的 HT 和 HTO 采集器以区分测量氚，HTO (T<sub>2</sub>O) 直接装在一个双套瓶子里，而部分气溶胶氚 HT 则被放进一个小低温催化氧化器中，进行 HT (T<sub>2</sub>) 氧化，之后收集在第二套玻璃瓶中。

Cascaded triple vials are provided to ensure virtually 100% collection efficiency.

Other isotopes that can be collected include Carbon 14, where the radioisotope, in the form of <sup>14</sup>CO<sub>2</sub>, is collected by using specific chemical reagents.

使用级联三瓶以确保几乎 100% 收集效率



1160 US ROUTE 50

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## DESCRIPTION: 说明

The self-contained instrument consists of a pump and flow regulator to draw a constant sample (air) stream into a set of vials which collect the radioactive material. 本一体机包含一个泵和一个流量调节器，将样品流（气体）源源不断吸进一套采集辐射物的玻璃瓶中。

Two sets of vials are used to ensure that whatever may be missed by one vial is virtually certain to be trapped by a second and third.

使用两套收集瓶以确保一旦一个瓶子出现遗漏，第二个和第三个瓶子会弥补

One set vials is used to collect tritium oxide, the air stream exiting from this set is passed through a small low temperature catalytic oxidizer and the resultant oxides are then trapped in the second set of vials.

一套收集瓶被用来收集氧化氚。本套瓶中现有的空气流被传送到一个小低温催化氧化器中，生成的氧化物被收集在第二套瓶中。

A timer is mounted on the front panel of the instrument, as well as visual indicators to signal failure of sample flow. A rotameter and a low flow switch monitor the sampling flow rate.

仪器前板上安装了一个计时器，一个可监测样品断流的可视指示器，一个转子式测速仪和一个低流量开关来监测样品流量。

## TASC TECHNICAL SPECIFICATION

### TASC技术规格

#### SENSITIVITY

灵敏度

Better than  $10^{-9}$  Ci/m<sup>3</sup>, The detection limit depends on the collection time, for any given sample flow rate

优于  $10^{-9}$  Ci/m<sup>3</sup>，检测限取决于采集时间，适用于任何给定的样品流量。

#### FLOW RATE

流量

Electronic Mass Flow Meter range from 10 to 500 ml/min or Rotameter (0 - 100 ml/min.typical). Other ranges are available

电子质量流量计量程10-500 ml/min或转子式测速仪（典型设置0 - 100 ml/min），可提供其它量程

#### PUMP

泵

Oscillating piston high reliability pump.

振荡活塞高可靠性气泵

#### FLOW FAILURE

样品流故障

△ P sensor, relay and pilot light

△ P传感器，继电器盒指示灯

#### SAMPLING VIALS

采样瓶

20 cc vial, or other as requested

20 cc瓶，或按要求

#### OXIDIZER

氧化器

Heated platinum palladium cartridge

加热铂钯盒

#### ELAPSED TIME

使用时间

Electronic timer

电子计时器

#### ENCLOSURE COOLING

机箱散热

Long life fan

长寿命风扇

#### ENVIRONMENTAL

工作环境

0-50°C, 0-99% R.H.

温度0-50°C, 湿度0-99%

## FOR NRC, EPA, & DOE COMPLIANCE REQUIREMENTS

### 关于 NRC, EPA&DOE 规定性要求

The TASC uses well proven techniques of passively collecting very low level radioactive samples by continued trapping in vials containing liquid or granular agents.

TASC 使用成熟技术，持续被动采集低辐射样品到含有液体或颗粒剂收集瓶中。

Government regulations impose very strict requirements on minimum detectable activity levels. Passive samplers, although they do not provide real time data, provide a low cost highly effective method of measuring to extremely low levels, thereby ensuring compliance.

政府对辐射物最小探测活动水平规定非常严格。尽管被动采样器不提供实时数据，但却提供了低成本高效率的对极低辐射水平测量方法，因此保证符合了规定。



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