

PASSIVE SAMPLERS



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TRITIUM AND CARBON 14 IN AIR SAMPLE COLLECTING SYSTEM

A COMPLETELY SELF CONTAINED PASSIVE SAMPLE COLLECTOR FOR AIRBORNE RADIOACTIVE MATERIAL

TRITIUM IN AIR SAMPLE COLLECTING SYSTEM FOR MEASUREMENT TO 10^{-9} Ci/m³ OR LOWER

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

METHOD OF OPERATION AND USE

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.

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.

RADIOISOTOPES, TRITIUM, CARBON 14 OR OTHER

Separate HT and HTO collectors are provided for discriminating tritium measurement. The HTO (T₂O) 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 (T₂) into the oxide by means of a small low temperature oxidizer.

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 ¹⁴CO₂, is collected by using specific chemical reagents.

DESCRIPTION

The self-contained instrument consists of a pump, mass flow controller and regulated oxidizer.

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.

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

A timer is mounted on the front panel of the instrument, as well as visual indicators to signal failure of sample flow. Two digital displays are displaying the airflow rate and oxidizing temperature.



FOR NRC, EPA & DOE COMPLIANCE REQUIREMENTS

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

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.



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TASC TECHNICAL SPECIFICATION

SENSITIVITY	For Tritium: Better than 10^{-9} Ci/m ³ For Carbon 14: Better than 1×10^{-11} Ci/m ³ The detection limit depends on the collection time for any given sample flow rate
FLOW RATE	Electronic Mass Flow Meter (0 - 250 scc/min)
PUMP	Diaphragm brushless high reliability pump
FLOW FAILURE	Mass Flow sensor and pilot light
SAMPLING VIALS	20 cc vial, or other as requested
OXIDIZER	Thermal
ELAPSED TIME	Electronic timer
ENCLOSURE COOLING	Long life fan
ENVIRONMENTAL	5 - 50° C, 0 - 99 % R.H.

