



Radioactive Materials Reference Sheet:



Tritium

Long Lived Radionuclide

Half-life	: 12.32 years
Type of Emitter	: Beta
Beta Energy	: 0.0186 MeV
Travel Distance in Air	: 0.61 cm : 0.24 inches
Travel Distance in Tissue	: Insignificant

Annual Intake Limits	
Inhalation	: 80 mCi
Ingestion	: 80 mCi

CONCERNS

The major concern with using ³H is internal exposure. ³H cannot be readily monitored during its use, as with a survey meter, therefore, special precautions are needed to keep the work environment clean. Many tritium compounds readily migrate through gloves and skin because of the chemical compound. Exposure may occur if an individual contaminates their skin, accidentally ingests the material, or breathes in a gas or vapor. Simply put, ³H is not hazardous if external to the body.

SHIELDING

- None required

DETECTION

- Removable contamination is detected by a wipe survey (bench tops, floors, refrigerator handles, phone, etc.) and counting the wipes in a Liquid Scintillation Counter.




Laboratory Safety

SAFETY RULES FOR ^3H

- Follow General Safety Precautions for all isotopes.

Specific Recommendations:

WHILE WORKING

- Many tritiated compounds can readily penetrate gloves and skin. Wear two pairs of gloves and change the outer pair every fifteen to twenty minutes to reduce cross contamination (spreading contaminant to other surfaces and areas) and skin absorption. 
- Some forms of tritium, such as ^3H gas and $^3\text{H}_2\text{O}$, are volatile. Suitable traps may be necessary to reduce releases.
- **Routinely wipe surfaces to monitor for tritium contamination. Portable survey meters (Geiger Counters) are NOT sensitive to tritium.**
- Submit a urine sample for bioassay if requested by the Radiation Protection Office or if an intake is suspected.

POST-USE

- Conduct a wipe test of work areas and equipment surfaces and count them in a Liquid Scintillation Counter.
- Dispose ^3H waste according to the waste disposal guidelines. If by sink disposal, ensure that it is soluble in water and does not exceed the posted limit (1000 μCi daily, if only one radionuclide is being disposed of). Do not exceed this limit, unless otherwise authorized by the Radiation Safety Committee in the permit.
- ^3H and ^{14}C waste may be combined but must be segregated from short-lived waste.