

Tritium ^3H

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Radioactive Half-life $T_{1/2}$:	12.4 years
Principal Emission:	18.6 keV beta (maximum)
Monitoring for Contamination:	Swabs counted by liquid scintillation
Biological Monitoring:	Urine samples
Annual Limit on Intake (ALI) by Ingestion or Inhalation:	3×10^9 Bq (~80mCi) (tritiated water)
Maximum Range in Air:	6 mm
Maximum Range in Water:	6×10^{-3} mm
Shielding:	None

Special Considerations: Tritium, because of its low beta-energy, cannot be monitored directly and therefore special care is needed to keep the working environment clean. Regular monitoring by counting swabs is advisable in areas where this nuclide is used. Tritium can be absorbed through the skin. Appropriate gloves should be worn. External contamination, although not causing a radiation dose itself, should be kept as low as possible as it can lead to internal and hence hazardous contamination; it can also interfere in experimental results. DNA precursors eg tritiated thymidine are regarded as more toxic than tritiated water partly because activity is converted into cell nuclei. This is reflected by lower ALIs for the material in this form. (refer to ICRP30)

HANDLING PRECAUTIONS

- Wear protective clothing, gloves and safety glasses.
- Avoid contact with eyes, skin and clothing.
- Do not pipette radioactive solutions by mouth.
- Work in a well ventilated area, volatile materials should be contained in a chemical fume hood.
- Monitor area regularly by wipe test to avoid contamination.
- Wash hands and monitor before leaving a radioactive area.
- Use only disposable towels and tissues; dispose of as radioactive waste.

STORAGE PRECAUTIONS

- Contain Radioactive Material in designated area.
- Label Radioactive Material clearly, indicate: Nuclide, total activity, date.
- Observe recommended storage temperatures and conditions.
- Observe posting and sign requirements for all storage areas.

SPILL OR LEAK PROCEDURE

- Cordon off area of contamination.
- Notify Radiation Safety Officer.
- Determine type and amount of contamination.
- Decontaminate the area from the outer edge by wiping or scrubbing.
- Monitor area to be certain decontamination is complete.
- Dispose of radioactive waste according to statutory requirements.