

RADIONUCLIDE SAFETY DATA SHEET

NUCLIDE: H-3

FORMS: SOLUBLE, EXCEPT GAS

PHYSICAL CHARACTERISTICS:

HALF-LIFE: 12.26 years

TYPE DECAY: beta⁻
maximum energy 0.0186 MeV

Hazard category: C- level (low hazard) : 1 - 25 mCi per item to 100 mCi possession
B - level (Moderate hazard) : >25 mCi per item to 10 Ci possession
A - level (High hazard) : greater than 10 Ci

EXTERNAL RADIATION HAZARDS AND SHIELDING:

Because of its low energy, the vial holding the isotope will provide sufficient shielding to stop the betas. If skin is contaminated with tritium, betas will not be able to pass the dead layer of skin. However, H-3 will cause a radiation dose if absorbed into body through cuts in skin or by ingestion.

HAZARDS IF INTERNALLY DEPOSITED:

The ALARA Annual Limit of Intake (ALI) based upon a whole body dose of 500 mrems year or upon the maximum recommended (N.C.R.P.) dose to the hematopoietic or spermatogonial stem cell nuclei (from DNA precursors) is as follows:

Whole body	8000 μCi (inorganic, soluble) based upon NRC ALI
Stem Cell Nuclei	350 μCi (CdR)
Stem Cell Nuclei .	700 μCi (other DNA and RNA precursors)

DOSIMETRY AND BIOASSAY REQUIREMENTS:

Film badges and dosimeter rings are not appropriate for monitoring H³ exposure.

Routine urine assays are required after handling 100 millicuries or more of H³. See Radiation Safety Manual Part III for particulars. Spot checks may be required after spills or contamination incidents.

SPECIAL PROBLEMS AND PRECAUTIONS:

1. Always wear protective gloves to keep contamination from skin. Change gloves often.
2. Since the H³ beta particles have very low energies, the use of G.M. or other survey meters is precluded. Smear surveys are required.
3. All waste in a H³ work area is considered to be contaminated. Keep work areas free of unnecessary items. Segregate wastes to those with H³ and C¹⁴ only.
4. Limit of soluble waste to sewer is 1000 microcuries/ day per lab; and limit of H³ labeled DNA precursors to sewer as waste is 100 microcuries per day. If the DNA precursors are denatured prior to disposal, the sewer limits would be the same as for soluble forms.

