

HYDROGEN-3

[³H]

Physical and Radiological Data

Physical half-life:	12.3 years
Low energy beta emitter:	0.0186 MeV (max), 0.0057 MeV (avg)
Maximum range in air:	6 mm
Maximum range in water:	6×10^{-3} mm
Critical organ:	whole body

Concerns

- ◆ Monitoring
Because ³H is such a low energy beta emitter, it cannot be monitored with a radiation survey instrument. Wipe testing should be done frequently to monitor possible contamination.
- ◆ Internal absorption
³H does not pose a significant external dose hazard, but when in contact with skin it may lead to hazardous internal contamination.

Shielding

- ◆ Low-density materials can be used to shield ³H. Plexiglas (Lucite) is the most highly recommended.

General Safety Precautions

- ◆ All persons handling ³H must wear a lab coat and disposable gloves. Safety glasses are recommended.
- ◆ Do not work directly over an open vial or container of ³H.
- ◆ Do not pipette ³H by mouth.
- ◆ Pipettes should be committed solely to ³H use and clearly labeled.
- ◆ Wipe test regularly.

Contamination

A radiation level greater than or equal to three times background is considered contamination. Here are some tips on what to do when contamination is found.

- ◆ If contamination is found on your hands:
Do not touch anything, this may spread contamination to door handles, etc. Wash thoroughly with non-abrasive soap and water, *blot* dry. Do not rub or abrade skin. Contact the RSO if this does not remove the contamination. Wipe test areas that may have been touched.

- ◆ If contamination is found on your shoes/clothing:
Do not walk around in contaminated shoes. Contaminated clothing will need to be removed, but some shoes may be decontaminated with a commercial contamination remover. Wipe test the area and floor to determine the extent of contamination. Contact the RSO.

- ◆ If contamination is found on the floor:
Immediately mark off the area and prevent anyone from walking near the contamination. Use a commercial decontaminant (i.e. Radiacwash) with paper towels to clean the area. Swipe the paper towels only once across the area and discard (in radioactive waste). To use a sweeping motion would only spread the contamination. Be sure to wipe test shoes. Contact the RSO.

- ◆ If contamination is found on the countertop, lab equipment, etc:
Use a commercial decontaminant and paper towels to clean the area. Place equipment in a shielded area if contamination cannot be removed.

Decay Table

YEARS	DECAY FRACTION	% ACTIVITY REMAINING
0	1.000	100
1	0.946	94.6
2	0.894	89.4
3	0.846	84.6
4	0.800	80.0
5	0.757	75.7
6	0.716	71.6
7	0.677	67.7
8	0.640	64.0
9	0.606	60.6
10	0.573	57.3
11	0.542	54.2
12	0.512	51.2

