

# RADIONUCLIDE SAFETY DATA SHEET

**RADIONUCLIDE:** **Y-88**

**FORMS:** Soluble

## PHYSICAL CHARACTERISTICS

**Half-life:** 106.627 days

### DECAY EMISSIONS

| Gammas / X-rays |      | Betas / Positrons (+) / Electrons |      | Alphas  |   |
|-----------------|------|-----------------------------------|------|---------|---|
| E (keV)         | %    | E (keV, max)                      | %    | E (keV) | % |
| 14.1            | 51.8 | 12.1                              | 26.5 |         |   |
| 15.8            | 7.4  |                                   |      |         |   |
| 898.0           | 93.7 |                                   |      |         |   |
| 1836.1          | 99.2 |                                   |      |         |   |

Only the four most likely emissions of each type are included. Emission must be > 10 keV and > 1% frequency.

## NIH HAZARD CATEGORY

C – level (low hazard):  $\leq 1.5$  mCi - No DRS protocol required

B – level (moderate hazard):  $> 1.5$  mCi and  $\leq 3$  mCi - DRS approval required for ceiling increase

A – level (high hazard):  $> 3$  mCi - DRS protocol required

## EXTERNAL RADIATION HAZARDS

Gamma dose rate, point source @ 1 foot, 1 mCi:

13.4 mrem/hr

Beta dose rate to skin, point source @ 1 foot, 1 mCi:

1.08 mrem/hr

Contamination skin dose, uniform deposit of  $1 \mu\text{Ci}/\text{cm}^2$

150 mrem/hr

## INTERNAL RADIATION HAZARDS

Annual Limit on Intake:

Ingestion: 1 mCi

Inhalation: 200  $\mu\text{Ci}$

The value(s) above indicate the activity taken into the body that would result in either 5 rem to the whole body (CEDE) or 50 rem to an organ or tissue (CDE).

## SHIELDING

### Gammas/X-rays:

49.3 mm Pb will decrease exposure by 90%.

### Betas/electrons:

3 mm Lucite will stop all betas. Lead may be needed if Bremsstrahlung is detectable through plastic shielding.

## DOSIMETRY AND BIOASSAY REQS

Dosimetry may be required when working with Y-88. Fill out Dosimetry Evaluation Form, and DRS will determine if it is required.

Whole body count may be required after spills, contamination, or other abnormal occurrences.

## SPECIAL PRECAUTIONS:

1. Contamination monitoring for Y-88 should be performed with a Sodium Iodide probe.
2. Y-88 should be handled with remote tools when possible.
3. Ensure Y-88 is properly shielded when in storage and use. Shield waste containers containing Y-88 waste.
4. Always wear lab coat, gloves, and protective eyewear when handling Y-88.
5. Source vials must be secured in a locked container when not in use.
6. Y-88 waste must be segregated from long half-life radionuclides ( $> 120$  days). Multi-hazard waste must be segregated from short and long half-life radionuclides ( $\leq 30$  days and  $> 120$  days respectively).

### References:

- Brookhaven National Laboratory, National Nuclear Data Center, Decay Radiation Search, Version 3/25/2022.
- National Institutes of Health Division of Radiation Safety, DRS-214 Form - Activity Control System - Cumulative Inventory Ceilings, Revised 10/4/2021.
- Nuclear Regulatory Commission, 10 Code of Federal Regulation Part 20 Appendix B.
- Smith, D., Stabin, M. Exposure Rate Constants and Lead Shielding Values for over 1,100 Radionuclides. Health Physics Journal. March 2012.
- Nuclear Regulatory Commission. Varskin+ Version 1.0
- National Institute of Standards and Technology, ESTAR: Stopping Power and Range Tables for Electrons, July 2017
- Ehs.stanford.edu/reference Radionuclide Fact Sheets