

RADIONUCLIDE SAFETY DATA SHEET

RADIONUCLIDE: **I-129**

FORMS: Soluble

PHYSICAL CHARACTERISTICS

Half-life: 15,700,000 years

DECAY EMISSIONS

Gammas / X-rays		Betas / Positrons (+) / Electrons		Alphas	
E (keV)	%	E (keV, max)	%	E (keV)	%
29	55.4	149	100		
34	11.8	34.125	10.6		
40	7.5	24.6	8.6		
		38.436	2.15		

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): n/a

B – level (moderate hazard): n/a

A – level (high hazard): Any quantity of I-129 - DRS protocol required

EXTERNAL RADIATION HAZARDS

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

0.7 mrem/hr

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

0 mrem/hr

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

1260 mrem/hr

INTERNAL RADIATION HAZARDS

Annual Limit on Intake:

Ingestion: 5 μCi

Inhalation: 9 μCi

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:

< 0.09 mm Pb will decrease exposure by 90%.

Betas/electrons:

0.3 mm Lucite will stop all betas.

DOSIMETRY AND BIOASSAY REQS

Dosimetry may be required when working with I-129. Fill out Dosimetry Evaluation Form, and DRS will determine if it is required.

Thyroid scan may be required after spills, contamination, or other abnormal occurrences. Routine scan must be performed if handling activities greater than those found in Table 2 of NRC Regulatory Guide 8.20.

SPECIAL PRECAUTIONS:

1. Contamination monitoring for I-129 should be performed with a Sodium Iodide probe.
2. I-129 should be handled with remote tools when possible.
3. Ensure I-129 is properly shielded when in storage and use. Shield waste containers containing I-129 waste.
4. Always wear lab coat, gloves, and protective eyewear when handling I-129.
5. Source vials must be secured in a locked container when not in use.
6. I-129 waste must be segregated from short half-life radionuclides (≤ 120 days). Multi-hazard waste must be segregated from short and medium half-life radionuclides (≤ 30 days and > 30 days but ≤ 120 days respectively).
7. Volatile iodine solutions should only be used in a proper fume hood. Contact DRS for effluent monitoring requirements.

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.
- National Institute of Standards and Technology, ESTAR: Stopping Power and Range Tables for Electrons, July 2017
- Delacroix, D., Guerre, J. P., Leblanc, P., Hickman, C., Radionuclide and Radiation Protection Data Handbook 2002.
- Smith, D., Stabin, M. Exposure Rate Constants and Lead Shielding Values for over 1,100 Radionuclides. Health Physics Journal. March 2012.
- Ehs.stanford.edu/reference Radionuclide Fact Sheets