

RADIONUCLIDE SAFETY DATA SHEET					
RADIONUCLIDE: Y-90			FORMS: Soluble		
PHYSICAL CHARACTERISTICS					
HALF-LIFE: 64.1 hours					
DECAY EMISSIONS					
Gammas / X-rays		Betas / Positrons (+) / Electrons*		Alphas	
E (keV)	%	E (keV, Ave)	%	E (keV)	%
		933	100		
- Only 4 most probable emissions per decay type included. Emissions below 10 keV or 1% excluded.					
STANFORD HAZARD CATEGORY					
C – level (low hazard): ≤ 2 mCi					
B – level (moderate hazard): > 2 mCi, ≤ 100 mCi					
A – level (high hazard): > 100 mCi					
EXTERNAL RADIATION HAZARDS			INTERNAL RADIATION HAZARDS		
Gamma dose rate, point source at 1 ft, 1 mCi: ~0 mrem/h			Annual Limit on Intake: 400 µCi (Ingestion) 600 µCi (Inhalation)		
Beta dose rate to skin, point source at 1 ft, 1 mCi: 400 mrem/h			The values 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).		
Contamination skin dose, uniform deposit of 1 µCi per cm ² : 7500 mrem/h					
SHIELDING			DOSIMETRY AND BIOASSAY REQS		
Gammas/X-rays: N/A			Whole-body and finger-ring dosimeters are required for handling 5 mCi or more, or 1 mCi amounts weekly . Urine assays may be required after large spills or contaminations.		
Betas/electrons: 9.2 mm of plastic will absorb all emissions. Bremsstrahlung may be created and require additional shielding.					
SPECIAL PROBLEMS AND PRECAUTIONS:					
<ol style="list-style-type: none"> 1. Recommended survey probe: PGM 2. Always wear protective gloves, a lab coat, and safety eyewear to protect the skin and eyes from contamination. Change gloves often. 3. Survey work areas before, during, and after work. Work areas may require shielding to keep dose ALARA. Instrument and smear surveys are required. 4. Segregate waste to those with half-lives of between 1 and 8 days. Survey the waste disposal area to ensure exposure rates are less than 2 mR/hr at 1 foot. 5. Limit soluble waste to the sewer to less than 10 µCi/day per lab. 					

References:

- Delacroix, D., Guerre, J.P., Leblanc, P., Hickman, C. (2002). Radionuclide and Radiation Protection Data Handbook (2nd ed.). Ashford, Kent: Nuclear Technology Publishing.
- Johnson, T.E., Birky, B.K. (2012). Health Physics and Radiological Health (4th ed.). Baltimore, MD: Lippincott Williams & Wilkins.
- ICRP, 2008. Nuclear Decay Data for Dosimetric Calculations. ICRP Publication 107. Ann. ICRP 38 (3).
- Peplow, D. (2020) Specific Gamma-Ray Dose Constants with Current Emission Data. *Health Physics*, 118(4):402-416; 2020.
- Smith, D., Stabin, M. (2012) Exposure Rate Constants and Lead Shielding Values for Over 1,100 Radionuclides. *Health Physics*, 102(3): 271-291.
- 10.CFR.20 – Standards for Protection Against Radiation (2019). Retrieved from <https://www.nrc.gov/reading-rm/doc-collections/cfr/part020/>