# RADIONUCLIDE SAFETY DATA SHEET

**RADIONUCLIDE:** Sr-90  
**FORMS:** Soluble

## PHYSICAL CHARACTERISTICS

**HALF-LIFE:** 28.8 years

**DECAY EMISSIONS**  
Includes Y-90 emissions under the assumption of secular equilibrium

<table>
<thead>
<tr>
<th>Emission Type</th>
<th>Energy (keV)</th>
<th>Activity %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gammas/X-rays</td>
<td>196</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>933</td>
<td>100</td>
</tr>
</tbody>
</table>

- Only 4 most probable emissions per decay type included. Emissions below 10 keV or 1% excluded.

## STANFORD HAZARD CATEGORY

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>low hazard: ≤ 20 µCi</td>
</tr>
<tr>
<td>B</td>
<td>moderate hazard: &gt; 20 µCi, ≤ 1 mCi</td>
</tr>
<tr>
<td>A</td>
<td>high hazard: &gt; 1 mCi</td>
</tr>
</tbody>
</table>

## EXTERNAL RADIATION HAZARDS

*Includes Y-90 emissions*

- Gamma dose rate, point source at 1 ft, 1 mCi: 0 mrem/h
- Beta dose rate to skin, point source at 1 ft, 1 mCi: 755 mrem/h
- Contamination skin dose, uniform deposit of 1 µCi per cm²: 13000 mrem/h

**INTERNAL RADIATION HAZARDS**

Annual Limit on Intake:  
- 30 µCi (Ingestion)  
- 4 µCi (Inhalation)

The values above indicate the activity taken into the body that would result in either 50 rem bone surfaces.

## SHIELDING

*Includes Y-90 emissions*

**Gammas/X-rays:**  
N/A

**Betas/electrons:**  
10 mm of plastic will absorb all emissions. Bremsstrahlung may be created and require additional shielding.

## DOSIMETRY AND BIOASSAY REQS

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 spills or contaminations.

## SPECIAL PROBLEMS AND PRECAUTIONS:

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 greater than 120 days (excluding H3 and C14). 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 0.1 µCi/day per lab.

## References:

03/2020 – H. Redman; redmanha@stanford.edu