



Radioactive Material Safety Data Sheet

This data sheet presents information on radioisotopes only. For information on chemical compounds incorporating this radionuclide, see the relevant Material Safety Data Sheet.

Promethium-147

Part 1 – Radioactive Material Identification			
Common Names:	Promethium-147	Chemical Symbol:	Pm-147or ¹⁴⁷ Pm
Atomic Number:	61	Mass Number:	147 (86 neutrons)
Chemical Form:	Promethium oxide	Physical Form:	Promethium-147 incorporated in a silver foil mounted in a stainless steel holder

Part 2 – Radiation Characteristics

Physical half-life: 2.6 years

ears

Specific Activity (GBq/g): 34,300

Principle Emissions	^E Max (keV)	^E eff (keV)	Dose Rate (Gy/h/MBq at 10cm)	Shielding Required
Beta* ()	225 (99.9%)	62	858 ^a	-
Gamma () / X-Rays	-	-	-	-
Alpha ()	-	-	-	-
Neutron (n)	-	-	-	-

Where Beta radiation is present, Bremsstrahlung radiation will be produced. Shielding may be required.

Note: Only emissions with abundance greater than 10% are shown.

^a The Health Physics and Radiological Health Handbook, Scintra, Inc., Revised Edition, 1992

Progeny: Samarium-147 (Sm-147)

Part 3 – Detection and Measurement

Methods of detection (in order of preference)

1. A radiation survey meter equipped with an energy-compensated Geiger Mueller detector.

2. A radiation contamination monitor equipped with a Geiger Mueller pancake detector.

3. A radiation survey meter equipped with a plastic scintillator detector.

Dosimetry

Whole Body	Skin 🗹 Extremity 🗹 Neutron 🗆		
Internal:	Sealed sources pose no internal radiation hazard. However, in the event of loss of containment by the sealed source, all precautions should be taken to prevent inhalation or ingestion of the material.		
Critical Organ(s):	not known at this time; possibly bone tissues		
Annual dose limits:	Non-nuclear energy workers: 1mSv per year Nuclear energy workers: a) 50 mSv in one year b) 100 mSv total over five years		
	Pregnant nuclear energy workers: 4 mSv over the balance of the pregnancy		

Part 4 – Preventive Measures

Always use the principles of time, distance and shielding to minimize dose

Engineering Controls: Sealed radioactive sources used in industrial applications should always be within a protective source housing to minimize radiation dose and to protect the source capsule from damage.			
Personal Protective Equipment (for normal handling of unsealed sources only. Always wear disposable gloves, safety			
glasses, personal protective equipment and clothing as appropriate to the material handled).			
No special PPE required.			
Special Storage Requirer	nents: None		
Opecial Storage Requirer			

Part 5 – Control Levels

Oral Ingestion	Inhalation	
ALI (kBq)	ALI (kBq)	DAC (Bq/ml)
1,850,000	7,400,000	148,000
Exemption Quantity (EQ):	10,000,000	

Part 6 – Non-Radiological Hazards

None are known at this time

<u>OSHA Permissible Exposure Limit (PEL)</u> No limit set at this time

Part 7 - Emergency Procedures

The following is a guide for first responders. The following actions, including remediation, should be carried out by qualified individuals. In cases where life-threatening injury has resulted, first treat the injury, second deal with personal decontamination. **Personal Decontamination Techniques** Wash well with soap and water and monitor skin Do not abrade skin, only blot dry Decontamination of clothing and surfaces are covered under operating and emergency procedures **Spill and Leak Control** Alert everyone in the area Confine the problem or emergency (includes the use of absorbent material) Clear area Summon Aid Damage to Sealed Radioactive Source Holder Evacuate the immediate vicinity around the source holder Place a barrier at a safe distance from the source holder (min. 5 meters) Identify area as a radiation hazard Contact emergency number posted on local warning sign **Suggested Emergency Protective Equipment** Gloves Footwear Covers Safety Glasses Outer layer or easily removed protective clothing (as situation requires)

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