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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.

Americium-241/Beryllium

Part 1 - Radioactive Material Identification

Common Names: Americium-241/Beryllium Chemical Symbol: Am-241/Be or ²⁴¹Am/Be

Atomic Number: 95 **Mass Number:** 241(146 neutrons)

Americium oxide with Compacted mixture of

Chemical Form: Physical Form: americium oxide with beryllium beryllium metal

metal.

Part 2 - Radiation Characteristics

Physical half-life: 432.2 years Specific Activity (GBq/g): 127

Principle Emissions	E _{Max} (keV)	E _{eff} (keV)	Dose Rate (Sv/h/GBq at 1m)	Shielding Required
Beta* ()	-	-	-	-
Gamma () / X-Rays	13.9 (42.7%) 59.5 (35.9%)	-	85 ^a	HVL Lead: 0.01 cm
Alpha ()	5,443 (12.8%) 5,486 (85.2%)	-	-	-
Neutron (n)	-	4,500	0.6ª	HVL Paraffin Wax: 6.6 cm

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

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

Progeny: Neptunium-237(Np-237)

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. This only measures the gamma component of the total dose.

^a Handbook of Health Physics and Radiological Health, Lippincott Williams & Wilkins , Third Edition, 1998

2. A BF₃ proportional detector – only measures the neutron component of the total dose.

Dosimetry

Whole Body	$\overline{\checkmark}$	Skin		Extremi	ty		Neutron	V	
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):	Bone surf	ace, Liver						
Annual dose limits:		Noi	Ion-nuclear energy workers: 1mSv per year Nuclear energy workers: a) 50 mSv in one year b) 100 mSv total over five ye		years				
		Pregnan	t nuclear ener	gy workers:	4 m	Sv over	the balance of tl	he pregr	nancy

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 Requirements: None

Part 5 - Control Levels

Oral Ingestion	Inhalation			
ALI (kBq)	ALI (kBq)	DAC (Bq/ml)		
29.6	0.222	1.11 x 10 ⁻¹⁰		
Exemption Quantity (EQ):	1,000 Bq			

Part 6 - Non-Radiological Hazards

Currently no information available for americium. Beryllium is a suspected carcinogen and is known to produce cumulative lung damage (Berylliosis).

OSHA Permissible Exposure Limit (PEL):

No limits currently set for americium

2 ug/m3 TWA for beryllium

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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