

RADIONUCLIDE SAFETY DATA SHEET

NUCLIDE: Pb-210/Bi-210/Po210

FORMS: SOLUBLE

PHYSICAL CHARACTERISTICS:

HALF-LIFE: 20.4 years;

TYPE DECAY: beta⁻, beta⁻, alpha (Pb, Bi and Po, respectively.)

Energies: beta⁻(Pb)0.061, beta⁻(Bi) 1.16, alpha (Po) 5.35 MeV

Hazard category: C- level (low hazard) : .0001 to 0.1 mCi

B - level (Moderate hazard) : > 0.01 mCi to 1.0 mCi

A - level (High hazard) : greater than 1.0 mCi

EXTERNAL RADIATION HAZARDS AND SHIELDING:

The external exposure hazard is from the Bi-210 beta particle (99%) with maximum energy of 1.16 MeV. The maximum range of these betas in various materials is as follows:

Air ~100 inches

Water ~0.17 inches

Glass ~0.07 inches

The beta dose rate at 1 cm from 1 mCi (from the Bi-210 in equilibrium) is approximately 310,000 mrad/hr.

HAZARDS IF INTERNALLY DEPOSITED:

This is a highly radiotoxic material. The principal hazard from Pb-210 occurs if the material is allowed into one's body. The Campus Annual Limit of Intake (oral), based upon a 10 % of the dose limit to bone surfaces, is 0.054 uCi. The effective half-life in the body is 1200 days. The campus ALI for inhalation is 0.0025 microcuries also based upon dose to bone surfaces.

DOSIMETRY AND BIOASSAY REQUIREMENTS:

Film badges and finger dosimeters must be worn when handling mCi amounts of Pb-210.

Urine assays will be required after spills or contamination incidents involving more than 0.1 microcuries.

SPECIAL PROBLEMS AND PRECAUTIONS:

1. Work in a fume hood to capture any dusts.
2. Always wear protective gloves to keep contamination from skin. Change gloves often.
3. Always survey work areas at conclusion of work. Smear surveys are required.
4. Segregate wastes to those with half-lives of greater than 90 days (but not with H3 and/or C14). Wrap wastes to minimize dust formation.
5. Limit of soluble waste to sewer to 0.1 microcuries/ day per lab. Generally, solidify liquid

wastes in cement kits.

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