

RADIONUCLIDE SAFETY DATA SHEET

NUCLIDE: Cd-109

FORMS: SOLUBLE

PHYSICAL CHARACTERISTICS:

HALF-LIFE: 464 days

TYPE DECAY: e^- capture

maximum energies e^- (MeV): 0.087 (10 %), .084 (44%), .063 (42%)
Energies of photons (intensity %/d): 0.088 (4%), 0.025 (18 %), 0.022 (84%)

Hazard category: C- level (low hazard) : .010 to 1.0 mCi

B - level (Moderate hazard) : > 1.0 mCi to 100 mCi

A - level (High hazard) : > greater than 100 mCi

EXTERNAL RADIATION HAZARDS AND SHIELDING:

The gamma exposure constant is $1.86 \text{ R-cm}^2/\text{mCi-hr}$. The amount of lead necessary to reduce the exposure rate by a factor of ten is 0.024 cm. The electrons emitted are at a low energy and do not constitute an external hazard.

HAZARDS IF INTERNALLY DEPOSITED:

Contamination of facilities and bodies is a more significant hazard than the external dose -- use of gloves and frequent monitoring while working are important. The annual limit of intake (oral) for this nuclide, based upon 10% of the dose limit to the kidneys is 27 μCi .

DOSIMETRY AND BIOASSAY REQUIREMENTS:

Film badges and finger dosimeters are not very useful when handling mCi amounts of Cd^{109} .

Urine assays may be required after spills or contamination incidents.

SPECIAL PROBLEMS AND PRECAUTIONS:

1. Always wear protective gloves to keep contamination from skin. Change gloves often.
2. Survey work areas at conclusion of work. Smear surveys are required for uncontrolled areas.
3. Segregate wastes to those with half-lives of greater than 90 days (but not with H^3 and/or C^{14}).
4. Limit of soluble waste to sewer to 10 microcuries/ day per lab.

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