

RADIONUCLIDE SAFETY DATA SHEET

NUCLIDE: I-131

FORMS: INORGANIC OR FREE IODINE

PHYSICAL CHARACTERISTICS:

HALF-LIFE: 8.04 days

TYPE DECAY: beta⁻

Beta maximum energy 0.806 MeV (0.6 %)

Gamma rays 0.248 MeV (6.10 %)

0.364 MeV (81.25 %)

0.637 MeV (7.26 %)

0.723 MeV (1.80 %)

Hazard category: C- level (low hazard) : 1 to 100 uCi

B - level (Moderate hazard) : > 100 uCi to 10 mCi

A - level (High hazard) : > 10 millicuries

EXTERNAL RADIATION HAZARDS AND SHIELDING:

Exposure rate at 1 cm from 1 mCi is 2.2 R/hr. (Exposure is directly proportional to activity and inversely to square of distance from materials.)

Amount of lead required to reduce the exposure rate by a factor of 10 (1 TVL) is approximately 1.1 centimeter.

HAZARDS IF INTERNALLY DEPOSITED:

Contamination on the skin or inhalation from air containing iodine vapors will result in internal deposition. Iodide solutions are easily oxidized and the elemental iodine will become airborne. About 70% of activity inhaled is deposited in the body and about 30% of that is deposited in the thyroid. Continual presence of 0.07 microcuries in the thyroid gland will result in that gland receiving the maximum dose recommended by the NCRP, i.e. 15 rem/year. Inhalation of 1 microcurie results in a dose of 1.9 rem to the thyroid. The Annual Limit of Intake of I131 corresponding to a whole body exposure rate of 500 mrem/year is 9 microcuries.

Blocking the uptake of radioiodine with the stable nuclide is not permitted. WORK IN PROPER FUME HOODS. (See Radiation Protection Manual, page 63).

DOSIMETRY AND BIOASSAY REQUIREMENTS:

Film badges and finger dosimeters are required if 5 mCi are handled at any one time or millicurie levels are handled on a frequent (daily) basis.

Arrange for a thyroid survey within 24-48 hours after the first procedure; thereafter, every three months.

SPECIAL PROBLEMS AND PRECAUTIONS:

1. Segregate wastes to those with half-lives of 8 to 19 days. Wrap all waste items in plastic bags prior to placing them in waste.
2. Limit of soluble waste to sewer is 100 uCi / month / lab.
3. Wear double gloves. Survey frequently with GM monitor.

