Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

Canada

Canadian Nuclear Safety Commission
Radiation 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.

Part 1 - RADIOACTIVE MATERIAL IDENTIFICATION

Chemical Symbol:	I	Common Names:	Iodine
Atomic Weight:	131	Atomic Number:	53

Part 2 - RADIATION CHARACTERISTICS

Physical Half-Life: 8.04 days

Unconditional Clearance Levels: Activity Concentration (Bq/g) 1×10^{1}

CNSC Exemption Quantity: Activity Concentration (Bq/g) 1×10^{2}
Activity (Bq) 1×10^{6}

Principal Emissions	**Average Energy of Most Abundant Emission (MeV)**	**Maximum Energy of Most Abundant Emission (MeV)**	**Gamma-Ray Dose Rate at 1m Distance (mSv/h per GBq)[1]**	**Shielding Information[2]**
Neutrons	-	-	-	-
Gamma & X-ray	0.3645	-	0.076	Half-value layer (lead): 3 mm
Beta* & Electron	0.1915	0.606	-	Total absorption: 0.9 mm glass or 1.6 mm plastic
Alpha	-	-	-	-

* Where beta radiation is present, bremmstrahlung radiation will be produced. Shielding for bremmstrahlung radiation must be considered.

[1]Shleien, B. et al, Handbook of Health Physics and Radiological Health Third Edition, 1998.
[2]Delacroix, D. et al, Radionuclide and Radiation Protection Data Handbook 2002.

Progeny	< 1% to ^{131m}Xe (11.8 d)

Part 3 – DETECTION AND MEASUREMENT

Method of Detection:

Gamma probe (e.g., NaI scintillation counter)
Beta probe (e.g., thin window Geiger-Mueller detector)

Dosimetry:

External: TLD (whole body & skin) ✓ Extremity ✓ Neutron _____

Internal: Whole body _____ Thyroid ✓ Urine analysis ✓ Other (specify) _____

Part 4 - PREVENTATIVE MEASURES

Iodine compound can become volatile. Handle and store in ventilated areas. Exposure to significant amounts of radioiodine increases risk of developing thyroid cancer. Iodine is toxic by ingestion and inhalation and a strong irritant of eyes and skin. Iodine can be absorbed through the skin. Heating Hippuran (I-131) or sodium iodide - 131 to decomposition may result in radioactive fumes containing I-131 to be emitted.

Recommended protective clothing: Disposable plastic, latex, or rubber gloves. Wear a lab coat, which must be monitored before leaving the laboratory. Also wear safety glasses. Fluoroscopy aprons provide no protection against the radiation from I-131. Always wear disposable plastic when working with I-131 and use instruments to handle I-131.

Optimize time, distance, shielding. Use syringe shields and tongs. Store volatile iodine-131 in a refrigerator to reduce the production of radioactive vapour. Use disposable absorbent liners on trays.

Consult CNSC license for requirements concerning engineering controls, protective equipment, and special storage requirements.

Part 5 - ANNUAL LIMIT ON INTAKE

	Ingestion	Inhalation
Compound Type	All compounds	All compounds
Annual Limit on Intake (Bq)	9.1×10^5	1.0×10^6

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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. In the case of an emergency, the Radiation Safety Officer should be contacted as soon as practicable.

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
- Clear area
- Summon Aid

Emergency Protective Equipment, Minimum Requirements

- Gloves
- Footwear Covers
- Safety Glasses
- Outer layer or easily removed protective clothing
- Suitable respirator selected

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