^{131}I	Nuclide Safety Data Sheet Iodine-131 **www.nchps.org**	^{131}I

[1]

Half-Life [$T_{½}$] : Physical $T_{½}$: 8.04 days
Biological $T_{½}$: 120-138 days (unbound iodine)
Effective $T_{½}$: 7.6 days (unbound iodine)
Specific Activity: 1.24E5 Ci/g [4,600 TBq/g] max.

II. RADIOLOGICAL DATA III. SHIELDING

	Half Value Layer [HVL]	Tenth Value Layer [TVL]
Lead [Pb][3]	3 mm (0.12 inches)	11 mm (0.43 inches)

- The accessible dose rate should be background but must be < 2 mR/hr

IV. DOSIMETRY MONITORING

- Always wear radiation dosimetry monitoring badges [body & ring] whenever handling ^{131}I
- Conduct a baseline thyroid scan prior to first use of radioactive iodine
- Conduct thyroid bioassay measurement [at neck just above collar bone] no earlier than 6 hours but within 72 hours of handling 1 mCi or more of ^{131}I or after any suspected intake

V. DETECTION & MEASUREMENT

Portable Survey Meters:

Geiger-Mueller [e.g. PGM] to assess shielding effectiveness & contamination

Wipe Test: Liquid Scintillation Counter or Gamma Counter

VI. SPECIAL PRECAUTIONS

- Avoid skin contamination [absorption], ingestion, inhalation, & injection [all routes of intake]
- Use shielding [lead or leaded Plexiglas] to minimize exposure while handling mCi quantities of ^{131}I
- Avoid making low pH [acidic] solutions containing ^{131}I to avoid volatilization
- For Iodinations:
    - Use a cannula adapter needle to vent stock vials of ^{131}I used; this prevents puff releases
    - Cover test tubes used to count or separate fractions from iodinations with parafilm or other tight caps to prevent release while counting or moving outside the fume hood.

[1] Health Physics & Radiological Health Handbook, 3rd Ed. [Baltimore, MD; Williams & Wilkins, 1998], p. 6-11
[2] Federal Guidance Report No. 11 [Oak Ridge, TN; Oak Ridge National Laboratory, 1988], p. 136, 166
[3] HVL & TVL values from: Delacroix, D. et al. Radionuclide and Radiation Protection Handbook [*Radiation Protection Dosimetry*, vol.76, nos 1-2, 1998, Nuclear Technology Publishing, Ashford, Kent, England, 1998], p. 90

VII. GENERAL PRECAUTIONS

1. Maintain your occupational exposure to radiation As Low As Reasonably Achievable [ALARA].
2. Ensure all persons handling radioactive material are trained, registered, & listed on an approved protocol.
3. Review the nuclide characteristics on (reverse side) prior to working with that nuclide. Review the protocol(s) authorizing the procedure to be performed and follow any additional precautions in the protocol. Contact the responsible Principal Investigator to view the protocol information.
4. Plan experiments to minimize external exposure by reducing exposure time, using shielding and increasing your distance from the radiation source. Reduce internal and external radiation dose by monitoring the worker and the work area after each use of radioactive material, then promptly cleaning up any contamination discovered. Use the smallest amount of radioisotope possible so as to minimize radiation dose and radioactive waste.
5. Keep an accurate inventory of radioactive material, including records of all receipts, transfers & disposal. Perform and record regular lab surveys.
6. Provide for safe disposal of radioactive waste by following institutional waste handling & disposal procedures. Avoid generating mixed waste (combinations of radioactive, biological, and chemical waste). Note that lab staff are not permitted to pour measurable quantities of radioactive material down the drain.
7. If there is a question regarding any aspect of the radiation safety program or radioactive material