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odination is the process of introducing iodine atoms (in this case, radioactive iodine) into a molecule by substitution or addition. Radioactive iodine is a commonly used tracer in biomedical research as well as an effective therapy for thyroid cancer.

REQUIREMENTS

- **Authorization** - The Principal Investigator must be authorized to use the isotope.
- **Working fume hood** - All iodinations must be performed in a certified chemical fume hood. If high activity iodinations are performed frequently, then a charcoal-filtered fume hood or iodination glovebox may also be required.
- **Portable survey instrument** - A sodium iodide (NaI) detector for I-125 or Geiger Muller (GM) detector for I-131 is required to perform surveys before, during, and after the procedure.
- **Lead shielding** - Use thin lead (minimum 1/16") sheets when using I-125. Use thick lead (minimum 1/2") when using I-131.
- **Thyroid Bioassay** - For individuals performing iodination for the first time, a baseline bioassay is required. Follow-up bioassays after the procedure must occur within three days for I-131, or seven days for I-125. Contact radsafety@usc.edu in advance to schedule a bioassay.
- **Dosimetry** - A dosimeter may be issued if the individual regularly handles high activity stock vials of iodine.

IODINATION HAZARDS

- Significant volatility
- High radiotoxicity
- Readily absorbed by the thyroid gland

GENERAL SAFETY GUIDELINES

- **Double glove** - Some compounds can penetrate gloves and, if iodinated or associated with free radioactive iodine, can facilitate iodine absorption at the skin surface. Double glove in addition to standard laboratory PPE.
- **Survey often** - Leave the detector on during the procedure to frequently check gloves and equipment for contamination.
- **Perform a dry run** - Practice procedural techniques without radioactive material to avoid errors and minimize handling and exposure times.
- **Contain spills** - Use spill trays and line the work space with absorbent material to prevent inadvertent spills from spreading.
- **Store at room temperature** - Frozen solutions enhance the volatility of the iodine. Unless instructed by the manufacturer, do not freeze.
- **Use capped waste containers** - Dispose of all waste into capped waste containers to contain any volatile iodine.



REFERENCES

University of Pittsburgh, [Guidelines for Iodinations](#)

University of Michigan, [Iodine-131 Radiological Safety Guidance](#)

