

238U

LAB INFO SHEET

Uranium is a naturally occurring radioactive material which is sometimes used in research laboratories, for example in electron microscope labs or in the geology department. These compounds are exempt from many regulations due to the fact that they are naturally occurring. Uranium nitrate and acetate compounds are ordered as a chemical, without regard to the radioactive element. However, the radioisotopes do emit alpha, beta and gamma radiation and should be handled appropriately. If you have any questions pertaining to safe handling procedures for uranium, please call Radiation Safety at 203-785-3550.

Information and Safe Handling Tips

²³⁸U

Half-life: 4.468 x 10⁹ years

Specific Activity: 3.6 x 10⁻⁴ mCi/gm of depleted uranium

Radiation Hazard

External Exposure: Very low

Internal Exposure: Yes, if inhaled. 4.2 MeV alpha particle

Training Requirements

- All trainings can be found at ehs.yale.edu/radiation-trainings.
- Anyone who works for a PI authorized to possess the uranium compound is required to take:
 - Radiation Safety Basic Concepts: Part I AND
 - Radiation Safety Applied: Part II
- Anyone who does not work for that PI and who does not use uranium compounds, but works in the same area, is required to take:
 - Radiation Safety Awareness

Dosimetry

- No radiation dosimetry is required for using uranium compounds.

Equipment Requirements

- Geiger Mueller (G-M) Detector.

Radiation Monitoring and Surveys

- Personnel, equipment and the work area must be monitored during and after the use of uranium compounds.
- The work area (vented hood, workbench, etc.), equipment and tools must be clearly marked with the Radioactive Material sign and with the Radioactive SPILL poster.
- A G-M detector must be present in the lab to perform surveys after each experiment.
- If you are only using a GM, be sure to have a documented monthly survey available in a folder in the lab that you can present if asked.
- Liquid Scintillation Counter (LSC) wipe tests are not required unless the lab also possesses other radioactive materials that do require a wipe test (e.g. C-14, H-3, P-32). In that case, the uranium material area should be included in the required monthly wipe test survey.

ALARA: Time—Distance—Shielding.

NO EATING, DRINKING, OR SMOKING in lab.

Safety Procedures

- Always wear personal protective clothing (gloves, lab coat, safety goggles).
- Continuously monitor experiments with a survey meter equipped with a pancake probe.
- All work with radioactive material should be performed on absorbent material.
- Exercise care when handling uranium in powder form to prevent spills or airborne material.
- Wash hands after each use.
- Refer to the MSDS for chemical hazards.

Emergency Response

- If powder spills - cover the area immediately with moist paper towels.
- If liquid spills - Cover the area immediately with absorbent material.
- Leave area and immediately notify Radiation Safety at 203-785-3555.
- If personal contamination is detected, wash affected area with copious amounts of water, and notify Radiation Safety at 203-785-3555.

Waste Disposal

- **Dry waste** such as gloves, absorbent material, and/or Kimwipes that are contaminated with these compounds should be collected in a dry radioactive waste container. Contact Environmental Affairs at 203-432-6545 to obtain a dry waste container, and for the prompt removal of your radioactive waste containers.
- **Liquid waste** that cannot be absorbed and disposed of as dry waste should be collected in a liquid radioactive waste container. Please use a secondary container when storing the liquid waste jug. An inventory log sheet must be kept documenting the contents of the solution in the liquid waste jug. Contact Environmental Affairs at 203-432-6545 to obtain a liquid waste container and for the prompt removal of filled containers.
- **Sharps (syringes/needles, scissors, pipette tips, contaminated pen/pencil, etc.):** Anything that could puncture the plastic dry waste bag needs to be placed into a sharps waste container.

Source: US Nuclear Regulatory Commission – Source Materials
<https://www.nrc.gov/materials/srcmaterial.html>