NEW YORK STRUCTURAL BIOLOGY CENTER

Standard Operating Procedure For Work with Uranyl Salts	Created: 07/06/2017 Reviewed: 07/11/2017

Chemical name/class: **Uranyl acetate; uranyl formate** **CAS #:** **16984-59-1 (uranyl formate)**

1. **Circumstances of Use:**

Uranyl acetate and uranyl formate are solids below 120°C. They are used in low concentration (<2% w/v) aqueous solution to enhance contrast on biological samples for electron microscopic analysis. They are toxic salts and are made with depleted uranium, so they have residual radioactive activity. Because they come in powder form, care must be taken to avoid contaminating large areas of the lab.

2. **Potential Hazards:**

General:

- Avoid breathing dust/fumes/mist/vapors/spray.
- Wash thoroughly after handling.
- Do not eat, drink, or smoke when using this product.
- Use only in a well ventilated area.
- Made from depleted uranium: residual radioactivity present.
- Consult the Safety Data Sheet (SDS) and

Toxicity:

- Toxic if swallowed.
- Toxic if inhaled.
- Causes eye irritation.

Reactivity:

- N/A

3. **Engineering Controls:**

- Use uranyl salts in a defined area of the lab.
- Salts are stored in a locked container and are not available for general use.
- By design, general users should only handle small aliquots and should never be handling the powdered salts.
- Use a specified set of pipetmen to dispense solutions.

4. **Work Practice Controls:**

- Only center staff are to handle the powdered salts. Staff will prepare standard solutions for general use.
- Users are NOT to weigh out the powdered salts.
- A standard set of solutions are stored in the 4°C refrigerator and in the -80°C freezer.

5. **Personal protective equipment (PPE):**

- Because of high toxicity, PPE must be worn when working with these materials.
- Wear a chemically-compatible laboratory coat that fully extends to the wrist.
- Wear gloves.
- Wear standard laboratory safety glasses.

6. **Transportation and Storage:**

- Powdered salts are stored in a locked container only accessible by center staff.
- Uranyl acetate aliquots are stored in the 4°C refrigerator.
- Uranyl formate aliquots are stored in the -80°C freezer.
- Radioactive material, excepted package-limited quantity of material.

7. **Waste Disposal:**

- Dispose of all material that comes in contact with uranyl salts in hazardous waste containers. Typically, these would be pipette tips, filter paper, parafilm strips, and gloves.
- Dispose of excess liquid in a designated liquid hazardous waste bottle.
- Do not dispose of uranyl solutions down the sink.
- Used grids should be treated as hazardous waste and disposed of accordingly. Do NOT leave them on the benchtop.

8. **Exposures/Unintended contact:**

- Skin contact: Immediately wash with water and soap and rinse thoroughly.
- Clothing contact: Immediately remove any contaminated clothing.
- Eye contact: Rinse opened eye for several minutes under running water. If symptoms persist, seek medical attention.
- Swallowing: Do not induce vomiting. Seek medical attention immediately.
- Inhalation: Supply fresh oxygen. Seek medical attention.
- In cases of eye contact, swallowing, or inhalation, an incident report found at: http://www.nysbc.net/twiki/bin/view/Staff/IncidentReports should be completed within 24 hours. Follow-up medical attention should be sought.

9. **Spill Procedure:**

- By design, general users should be working with 500 ul or less of solution, and should never be working with powder.
- For small spills of solutions, wear PPE and wipe up any spilled material with towels. Dispose water towels in hazardous waste containers. Contact center staff, who will thoroughly clean the area with a strong detergent.
- If solution is aspirated into a pipetman, contact center staff to arrange cleaning.

10. **Training of personnel:**

All personnel are required to attend the New User Orientation session which includes the General Lab Safety session. This session includes an introduction to general laboratory safety at NYSBC/NCCAT. All personnel shall read and fully adhere to this SOP for safe handling of uranyl salts, the SDS, and shall document that they have read these documents by signing and dating the SOP.

"I have read and understand this SOP. I agree to fully adhere to its requirements."

Last	First	Signature	Date