Standard Operating Procedure

**Mercuric acetate**

*This is an SOP template and is not complete until: 1) lab specific information is entered into the box below 2) lab specific protocol/procedure is added to the protocol/procedure section and
3) SOP has been signed and dated by the PI and relevant lab personnel.*

 Print a copy and insert into your
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.
Refer to instructions for assistance.

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| **Department:** | Molecular Biology Institute |
| **Date SOP was written:** | 4/29/2015 |
| **Date SOP was approved by PI/lab supervisor:** | 5/4/2015 |
| **Principal Investigator:** | David Eisenberg |
| **Internal Lab Safety Coordinator/Lab Manager:** | Daniel Anderson |
| **Lab Phone:** | x63642 |
| **Office Phone:** | x63642 |
| **Emergency Contact:** | Michael Sawaya x51402 |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | *BH219* |
| *(Building/Room Number)* |

**Type of SOP:** ☐ Process ☒Hazardous Chemical ☐ Hazardous Class

**Purpose**

Mercuric acetate is highly toxic if inhaled, ingested, or absorbed through the skin. It may cause irritation to the gastrointestinal tract, respiratory tract, skin, and eyes. It is a suspected reproductive toxicant according to California Prop 65. Mercuric acetate is used as a catalyst and chemical intermediate in organic synthesis. It is also used in the pharmaceuticals industry.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 1600-27-7

Class: **Acute toxicant, target organ effect, reproductive toxicant**

Molecular Formula: C4H6HgO4

Form (physical state): Solid

Color: White, off-white, beige

Boiling point: Unknown

**Potential Hazards/Toxicity**

Mercuric acetate is highly toxic if inhaled, ingested, or absorbed through the skin. It may cause irritation to the gastrointestinal tract, respiratory tract, skin, and eyes. It may cause birth defects or other reproductive harm. Symptoms of exposure include coughing, shortness of breath, headache, nausea, vomiting, and diarrhea. It may cause symptoms of mercury poisoning including irritability, sore gums, memory loss, increased saliva, metallic taste, personality changes, and brain damage. It may cause damage to kidneys, eyes, and central nervous system.

**Personal Protective Equipment (PPE)**

**Respirator Protection**

Use a full-face particle respirator with type N100 (US) respirator cartridges.

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by EH&S. This is a regulatory requirement. (<http://map.ais.ucla.edu/go/1004655>)

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL).
* As PPE in the event of a chemical spill clean-up process.

**Hand Protection**

Handle with nitrile gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with mercuric acetate.

Refer to glove selection chart from the links below:

<http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

**Eye Protection**

ANSI approved safety glasses or goggles.

**Skin and Body Protection**

Lab coats should be worn. These laboratory coats must be appropriately sized for the individual and be buttoned to their full length. Laboratory coat sleeves must be of a sufficient length to prevent skin exposure while wearing gloves. Full length pants and close-toed shoes must be worn at all times by all individuals that are occupying the laboratory area. The area of skin between the shoe and ankle should not be exposed.

**Hygiene Measures**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**Engineering Controls**

Work with this chemical in a certified ducted fume hood. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

**First Aid Procedures**

**If inhaled**

Move person into fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult a physician.

**In case of skin contact**

Wash off with soap and plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Flush with plenty of water for at least 15 minutes lifting upper and lower eyelids and removing contact lenses. Consult a physician.

**If swallowed**

Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**Special Handling and Storage Requirements**

**Precautions for safe handling:** Avoid contact with skin and eyes. Avoid inhalation and ingestion. Avoid dust formation. Ensure normal measures for preventative fire protection.

**Conditions for safe storage:** Store in secondary containment with “acute toxin” and “reproductive toxin” labels on the primary container, secondary containment and the storage location. Keep containers tightly closed in a dry, cool, and well-ventilated place. Protect from light and heat. Avoid strong oxidizing agents, reducing agents, and strong acids.

**Spill and Accident Procedure**

**Chemical Spill Dial 911 and x59797**

**Spill** – Assess the extent of danger. Help contaminated or injured persons. Evacuate the spill area. Avoid breathing vapors. If possible, confine the spill to a small area using a spill kit or absorbent material. Keep others from entering contaminated area (e.g., use caution tape, barriers, etc.).

**Small (<1 L)** – If you have training, you may assist in the clean-up effort. Use appropriate personal protective equipment and clean-up material for chemical spilled. Double bag spill waste in clear plastic bags, label and take to the next chemical waste pick-up.

**Large (>1 L)** – Dial **911** (or 310-825-1491 from cell phone) and EH&S at x59797 for assistance.

**Chemical Spill on Body or Clothes** – Remove clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Seek medical attention. *Notify supervisor and EH&S at x59797 immediately.*

**Chemical Splash Into Eyes** – Immediately rinse eyeball and inner surface of eyelid with water from the emergency eyewash station for 15 minutes by forcibly holding the eye open. Seek medical attention. *Notify supervisor and EH&S at x59797 immediately.*

# **Medical Emergency Dial 911 or x52111**

**Life Threatening Emergency, After Hours, Weekends And Holidays** – Dial **911** (or 310-825-1491 from cell phone) or contact the Ronald Reagan UCLA Medical Center (emergency room) directly at **x52111** (located at 757 Westwood Plaza, enter from Gayley Avenue). *Note: All serious injuries must be reported to EH&S at* ***x59797*** *within 8 hours.*

**Non-Life Threatening Emergency** – Go to the Occupational Health Facility (OHF), **x56771,** CHS room 67-120(This is on the 6th floor, 7th corridor, room 120. Enter through the School of Dentistry on Tiverton Drive and proceed to the “O” elevator to the 6th floor.)Hours: M - F, 7:30 a.m. to 4:30 p.m. At all other times report to Ronald Regan UCLA Medical Center (emergency room) at **x52111**. *Note: All serious injuries must be reported to EH&S at x59797 within 8 hours.*

**Needle stick/puncture** **exposure** (as applicable to chemical handling procedure) – Wash the affected area with antiseptic soap and warm water for 15 minutes. For mucous membrane exposure, flush the affected area for 15 minutes using an eyewash station. Page the needle stick nurse by dialing **231** from a campus phone, enter **93333** when prompted and then enter your extension. Hours: M – F, 8:00 a.m. to 4:00 p.m. At all other times report to Ronald Regan UCLA Medical Center (emergency room) at **x52111**. *Note: All needle stick/puncture exposures must be reported to EH&S at x59797 within 8 hours.*

**Decontamination/Waste Disposal Procedure**

Wearing proper PPE, decontaminate equipment and bench tops using soap and water. Dispose of the used mercuric acetate and disposables contaminated with mercuric acetate as hazardous waste.

*General hazardous waste disposal guidelines:*

**Label Waste**

* Affix an on-line hazardous waste tag on all waste containers using the Online Tag Program <http://otp.ucop.edu/> as soon as the first drop of waste is added to the container

**Store Waste**

* Store hazardous waste in closed containers, in secondary containment and in a designated location
* Double-bag dry waste using transparent bags <http://map.ais.ucla.edu/go/1002774>
* Waste must be under the control of the person generating & disposing of it

**Dispose of Waste**

* Dispose of regularly generated chemical waste within 90 days
* Call EH&S at x61887 for questions
* Empty Containers
* Dispose as hazardous waste if it once held extremely hazardous waste (irrespective of the container size) <http://ehs.ucla.edu/Pub/ExtremelyHazardousWaste.pdf>
* Consult waste pick-up schedule <http://ehs.ucla.edu/pub/HazWaste%20Pickup%20Schedule.pdf>

Prepare for transport to pick-up location

* Check on-line waste tag
* Write date of pick-up on the waste tag
* Use secondary containment

**Safety Data Sheet (SDS) Location**

Online SDS can be accessed at [http://msds.ehs.ucla.edu](http://msds.ehs.ucla.edu/)

**Protocol/Procedure (Add lab specific Protocol/Procedure here)**

The typical use of mercuric acetate in our lab is for the preparation of heavy atom derivatives of protein crystals. A typical stock of mercuric acetate is 1 mL of 0.1M concentration. If you need a smaller amount, consider contacting Michael Sawaya (BH205), who maintains available stock solutions. Before preparing a stock solution, put on gloves and lab coat. Obtain a heavy atom waste container (such as a 50 mL centrifuge tube) to put any wipes or pipet tips that come in contact with mercuric acetate. Contact Dan Anderson (BH219) to gain access to the heavy atom drawer which is kept locked. Use a spatula that is specifically labeled for heavy atom use. These spatulas are located in a drawer with the heavy atoms. Lay down a paper towel on the bench next to the balance in BH219 to rest the spatula when not in use. Place an empty microcentrifuge tube on the balance and tare it. Use a spatula to transfer about 0.032 g of mercuric acetate to the microcentrifuge tube. Return the bottle of mercuric acetate to the heavy atoms drawer. Wipe the spatula with a wiper to clean it. Put the dirty wiper in the waste container. Add 1 mL of deionized water to the microcentrifuge tube and mix. Put the dirty pipet tip in the waste container. Ask Dan to lock the drawer before you leave. Label the tube with 0.1 M mercuric acetate. Include your name and the date.

For heavy atom derivitization of protein crystals, prepare about 10 microliters of artificial mother liquor containing approximately 1 mM mercuric acetate. Instead of diluting a pre-existing mother liquor with heavy atom stock, I suggest preparing a mother liquor in which you replace the water component with the heavy atom stock solution. Crystals are typically sensitive to changes in ionic strength, and might dissolve if the mother liquor is simply diluted with heavy atom stock. Apply 5 microliters of the artificial mother liquor to a glass cover slip and use a loop to transfer the crystal to the heavy atom-containing mother liquor. Invert the coverslip over a reservoir containing approximately 0.5 mL artificial mother liquor with no heavy atoms. Used pipet tips should be deposited in an appropriate heavy atom waste container. The crystallization plate should be labeled as containing platinum, so it may be disposed properly after the experiment.

For running a heavy atom gel-shift assay using a Phast electrophoresis system: Pipet 3 uL of 1mg/mL protein on a piece of parafilm. Add 1 microliter of heavy atom stock solution to 3 microliters of 1 mg/mL protein. Transfer the mixture to a comb, and apply the comb to a Phast gel. The comb and parafilm and tips should be disposed in a labeled heavy atom waste container. Typically, this experiment is performed with several other heavy atoms, each in a separate lane of the gel.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with mercuric acetate, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and a copy of the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last one year.

**Principal Investigator**

Print name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approval Date:

I have read and understand the content of this SOP:

|  |  |  |
| --- | --- | --- |
| **Name** | **Signature** | **Date** |
| **Michael Sawaya** |  | **4/30/2015** |
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