Readiness Review

All Ames Laboratory activities must be approved by the Safety Review Committee via the Readiness Review procedure prior to the work being conducted. Ask your supervisor if you have any questions about the Readiness Review for your activity, and make sure you are approved to proceed.

The Iowa State University Laboratory Safety Manual serves as the Chemical Hygiene Plan for the Laboratory.

Hazards of Mercury

Mercury (Hg) is a heavy, silver-white, odorless metal that is liquid at room temperature. Historically, mercury was used in thermometers, barometers, manometers, and other equipment. Due to the serious health and environmental hazards of mercury, the Ames Laboratory is phasing out the use of mercury wherever possible.

HEALTH HAZARDS

When inhaled, mercury will be rapidly distributed throughout the body. Certain organic mercury compounds such as dimethyl mercury are more toxic than elemental mercury and require additional precautions. Some of these compounds can pass through gloves and intact skin. Minor exposure to the most toxic organic compounds can cause significant delayed illness or even death.

SYMPTOMS of elemental vapor exposure include:

- Tremors, irritability, temper outbursts, excitability, shyness and indecision
- Short term exposure to high levels can cause nausea, vomiting, diarrhea, increased blood pressure or heart rate
- Skin rashes and eye irritation

Chemical Compatibility

Incompatible with acetylene, acids, alkali and alkaline metals, aluminum, amines, ammonia, bases, chlorine dioxide, calcium, copper alloys, flammable liquids, fulminic acid, oxidizers. Amalgams form with many metals.

GHS Hazard Statements

- H330- Fatal if inhaled (Acute 2)
- H360- May damage fertility or the unborn child (1B)
- H372- Causes damage to organs through prolonged or repeated exposure
- H400-Very toxic to aquatic life (Acute 1)
- H410- Very toxic to aquatic life with long lasting effects (Chronic 1)

Storage/Disposal

- Store with poisons.
- Separate from incompatible chemicals listed above, especially bases, acids, alkali metals, flammable liquids, and oxidizers.
- Store in a well-ventilated, secure, cool and dry location.

Personal Protective Equipment

- **Eye Protection:** Laboratory safety glasses with side shields
- **Gloves:** Neoprene, natural rubber, vinyl or nitrile for elemental mercury.
- **Clothing:** Lab coat and impervious apron if significant dermal exposure potential exists.
- **Respirator:** Contact ESH&A.
- **Contact ESH&A** for PPE selection for handling highly toxic forms of mercury such as dimethyl mercury.

Handling Precautions

- Use enclosed systems that isolate mercury processes.
- Post appropriate warning signs and limit access to mercury operations.
- Floors and work surfaces should be nonporous and free of joints and cracks.
- Ventilate areas where mercury or mercury compounds are handled.
- Maintain equipment to prevent release of mercury liquid.
- Place mercury wastes in vapor-tight containers.
- Label waste containers with contents as required by hazardous waste procedures.
- See Safety Data Sheet for GHS precautionary statements.

First Aid

- If exposure occurs or is suspected, remove contaminated clothing, shoes, and leather goods and place in sealed plastic bag.
- Wash exposed area with soap and water.
- If ingested, immediately contact a POISON CENTER or Physician.
- Contact the Occupational Medicine Department for evaluation and notify your supervisor.

Spill Remediation

Personal protective equipment (PPE) requirements for spill response are greater than those for routine handling. A spill entirely contained within a laboratory fume hood may be managed by the researcher. All others are classified as large spills.

For large spills:

- Evacuate to a safe location, being careful not to spread the spilled mercury on your shoes or clothing.
- Prevent others from entering the spill area.
- Contact Plant Protection Services (294-3483), the ESH&A office (294-2153), or 911 for assistance.
- Spill materials must be collected as hazardous waste.
- Notify ESH&A immediately if mercury entered a sink or a floor drain.
- Notify your supervisor of ANY spill.

Physical Properties

Appearance: Heavy, silver-white, liquid (at room temperature)
Odor: None (odorless)
Formula: Hg
CAS#: 7439-97-6
Molecular Weight: 200.59
Specific Gravity @ 25 C: 13.633

Regulatory Information

Shipping Description:

Mercury
DOT Hazard Class 8 – Corrosive materials 49 CFR 173.136

DOT Hazard Label 8 – Corrosive substances, 6.1 Toxic substances

Applicable Exposure Limits:

ACGIH TLV (2001): 0.025 mg/m3

A4; Skin; BEI

OSHA PEL: 0.1 mg/m3 (Ceiling)

References

Safety &Health Bulletin, Safe Management of Mercury (Hg), DOE/EH-0697, Assistant Secretary of ES&H, US Department of Energy, Washington, DC, June 2005

Mercury Safety Data Sheet, Bethlehem Apparatus Company, 09 Front Street, Hellertown , PA 18055 11.19/13

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Environment, Safety, Health & Assurance
G40 TASF
294-2153

Mercury

Safe Management of Mercury

All activities at Ames Laboratory must be approved by the Safety Review Committee through the Readiness Review Process prior to beginning work.

Users of mercury must complete activity-specific training prior to work.

See your supervisor or ESH&A with any questions.

NOTE: This information is not intended to replace the Safety Data Sheet (SDS). Always have access to a current, vendor-specific SDS in your lab for each chemical.

AMES LABORATORY
Creating Materials & Energy Solutions
U.S. DEPARTMENT OF ENERGY