



LABORATORY SAFETY GUIDELINE

Mercury [CAS No. 7439-97-6]

All mercury users at Harvard must review this document and should contact their EHS Laboratory Safety Advisor and department safety officer prior to using this substance. Elemental mercury is a heavy, shiny, silver-white, odorless liquid. It is nonflammable, but releases toxic, odorless vapor, especially when heated.

HAZARDS

	Short-term exposure to high mercury concentrations in air can initially cause cough, sore throat, shortness of breath, nausea, vomiting, diarrhea, abdominal pain, headache, weakness, and visual disturbances. Several days after the initial exposure to high concentrations in air, heavy salivation, more severe gastrointestinal symptoms, and kidney damage can develop. Exposure to high concentrations of mercury vapor in air can ultimately be fatal.
	Long-term exposure to lower levels of mercury in air can damage multiple organs (the central nervous system and the kidneys are at the greatest risk of damage). If a pregnant woman is exposed to mercury vapor in air, her baby may have a greater risk of being born with birth defects.

Note: This guide is for elemental mercury. Organomercury compounds (e.g., dimethylmercury) are typically much more toxic and hazardous than elemental mercury. Please see our other Laboratory Safety Guidelines for information on the safe handling of organomercury compounds.

PRECAUTIONS

Before starting work:

- Determine if you can use a less hazardous substance in place of elemental mercury;
- Review the manufacturer's Safety Data Sheet and additional chemical information at <http://www.ehs.harvard.edu/safety-data-sheets-sds>;
- Ensure that a written experimental protocol including safety information is available;
- Ensure that you are working on a non-porous surface since mercury easily collects in tiny cracks and scratches;
- Be familiar with general University emergency procedures in the [EHS Emergency Response Guide](#);
- Order only the quantity that you need;
- Identify the location of the nearest eyewash and shower and verify that they are accessible;
- Locate and verify that appropriate mercury spill cleanup materials are available, including the following:
 - An appropriately sized spill kit specially designed for mercury (e.g., New Pig's Mercury Spill Kit) – this type of kit includes an absorbent material that will transform the mercury into a stable, safer amalgam.
 - NEVER use a vacuum to clean up a mercury spill.
- Post a sign in the work area: "Danger: Mercury Used in this Area"; and
- Do not work alone! Ensure another person who is familiar with your work and mercury hazards is in the area.

During work:

- AVOID INHALATION! Perform any heating operations in a certified chemical fume hood or other approved ventilated enclosure;
- AVOID CONTACT! Use appropriate personal protective equipment (PPE):
 - Wear a lab coat, long pants, shirt and closed-toed shoes.
 - Standard 4-mil thick nitrile gloves are adequate to protect the skin on your hands while working with mercury;
 - Gloves must be thoroughly inspected prior to each use. Do not use damaged gloves;
 - Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with mercury;
 - Change gloves at least once an hour and immediately whenever you suspect mercury has contacted your gloves;
 - Wear chemically-protective goggles (in lieu of goggles, work behind a mostly closed fume hood sash

- while wearing safety glasses); and
- Wash hands and forearms thoroughly with soap and water each time gloves are removed.
- Use materials and containers appropriate for mercury use and remain aware of potential incompatibilities. Mercury vapor can penetrate some plastics. Therefore, glass containers/materials work well. Keep in mind, however, that glass is fragile – overpack glass containers in plastic containers. Additionally, consider placing mercury absorbent material in the overpack container so that any potential spilled mercury is amalgamized immediately. Mercury absorbent powders are commercially available and commonly contain zinc.
- Keep all containers tightly closed when not in use and during transport.

After completing the work

- Dispose of waste mercury following Harvard University [Hazardous Waste Procedures](#). Collect mercury waste in a tightly sealed glass container. Overpack the glass waste container in a plastic container with a tight-fitting lid.
 - Hazardous Waste Classification: Toxic
- Return container to storage area following Harvard University [Laboratory Chemical Storage Guide](#)
 - Storage Group AT [High Acute Toxicity]
 - Store in designated plastic (polyethylene) secondary container.
 - Store in original containers or other appropriate containers (see section above)
 - Store mercury in a cool, dry, well-ventilated space. Also, mercury can be mildly corrosive – avoid storage in a metal cabinet.
- Because mercury residue easily remains on surfaces, it is a best practice to decontaminate any surfaces on which you worked with mercury. Mercury decontamination wipes are commercially available.
- Wash hands and forearms thoroughly with soap and water before leaving the lab.

EMERGENCY PROCEDURES

First Aid

SKIN CONTACT

- Flush skin with water for 5 minutes using the closest available sink, portable drench hose or safety shower. Remove any exposed clothing as well as any jewelry that may be trapping mercury;
- Call 911 on a landline phone for medical assistance (or provide location if calling on a mobile phone).

EYE CONTACT

- Using eyewash, flush eyes while holding eyelids open;
- Call 911 for medical assistance;
- Continue flushing eyes with water until emergency medical personnel arrive.

INHALATION

- If mercury mist or vapors are inhaled, immediately move to get fresh air;
- Call 911 for medical assistance.

INGESTION

- Do not induce vomiting;
- Call 911 for medical assistance;
- Rinse mouth with water if conscious;
- Never give anything by mouth to an unconscious person.

Spill Response

OUTSIDE FUME HOOD OR VENTILATED ENCLOSURE

- If the spill occurs on heated surfaces, alert others and evacuate to a safe distance and prevent entry.
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901]
- Remain in a safe location until EHS or other response personnel arrive.
- If the spill does not occur on heated surfaces, follow the procedures below.

INSIDE FUME HOOD OR VENTILATED ENCLOSURE (< 500 ml)

- If trained and confident, use your mercury spill kit to clean up the spill. During clean-up, ensure you are wearing PPE described above including goggles.
- Otherwise close the fume hood sash and await support.
- Contact the University Operations Center at (617) 495-5560 [HMS/HSDM (617) 432-1901] for any assistance.