

STANDARD OPERATING PROCEDURE

Procedure	Cleanup of mercury spill from broken thermometer
School/Department:	School of Molecular Bioscience
SOP prepared by:	Nick Coleman
Version:	SMB043.3

Section 1 - Personal Protective Equipment

1. Nitrile gloves
2. Lab coat or gown
3. Respirator if mercury vapour present (see below)
4. Safety glasses or goggles
5. Hair tied back if long
6. Proper enclosed footwear

Section 2 – Potential Hazards + Safety precautions

1. Skin contact, ingestion, or inhalation of mercury, leading to mercury poisoning
2. Environmental contamination with mercury, leading to ecosystem damage
3. Mercury spill must be contained, thoroughly cleaned-up, and disposed of as hazardous waste, in order to avoid human poisoning or ecosystem damage
4. Note that the metallic mercury used in thermometers is much less poisonous than mercuric ions (e.g. HgCl_2) or alkyl-mercury compounds (e.g. methyl mercury), but this compound is still a health and environmental hazard.
5. If the mercury is released in a hot environment (e.g. onto a heat block), this greatly elevates the degree of risk, and cleanup should not be attempted without wearing a respirator.
6. Broken glass from the thermometer poses a risk of cuts/puncture wounds. Handle with extreme care during cleanup operation.
7. Do not use a broom or a vacuum cleaner to clean up a mercury spill. Use the materials in the dedicated spill kit.
8. Workers with pre-existing medical conditions (e.g. allergy, immunocompromised state, chemical sensitivity) and workers who are pregnant or expecting pregnancy must consult with their supervisor AND medical specialist AND the university's WHS services before performing this procedure. If there are any serious concerns expressed by any of these individuals, this task must not be performed.

Section 3 – Procedure

1. Put on personal protective equipment, as above.
2. Secure the spill area and restrict access to avoid spreading the mercury further, and avoid contaminating shoes or other clothing or equipment. Close lab doors, alert other workers in the area to leave until spill is cleaned up.
3. If the mercury is in a hot environment (e.g. in a heating block or incubator), turn the heat off, and fetch respirator in addition to spill kit below. Heating will make mercury enter the vapour phase, where it poses an inhalation risk.
4. Fetch the mercury spill cleanup kit (yellow pouch) from Level 4 spill station
5. Carefully gather up all the broken glass fragments and put these in a ziplock plastic (provided in the spill kit).
6. Assuming mercury is on a flat smooth surface (e.g. bench or floor), use plastic scoop to collect the mercury droplets in one place. Check under and around benches and equipment in a wide area to ensure all the droplets are accounted for – these can travel a long way!
7. If the spill is not on a flat, smooth surface, cleanup may be more difficult. Consult the spills officer or the safety officer for assistance in this case.
8. Use a plastic 5 ml or 10 ml syringe to suck up as much of the mercury as possible. When it's all collected, tape up the syringe nozzle with masking tape or similar so that mercury can't leak back out. Put the mercury-containing syringe into the plastic bag that has the broken glass in it.
9. Add about 1 bag (approx. 30 g) of the mercury encapsulating chemical (white crystals) onto the mercury spill site.
10. Using the plastic scoop and scraper, mix and spread the crystals over the area affected by the

mercury spill. Once the area is covered, allow 2 min for binding.

11. Use the scoop and scraper to collect the powder back into its original bag, and label as "Mercury contaminated", put in with rest of waste in plastic bag.
12. Use a moist paper towel to mop up the area impacted by the spill. Add this paper towel into the same waste bag.
13. Return the scoop, scraper, and other gear to the mercury spill kit pouch.
14. Take off potentially mercury-contaminate gloves and put on fresh gloves. Put the contaminated gloves into the same waste bag as the other items.
15. Label the waste bag as "Mercury-containing waste" and estimate the amount of mercury in it (a typical thermometer has ~0.5 g of mercury). Also label the container with your name and room number and phone number so that the waste disposal officer can contact you for more information if needed.
16. Take off gloves (discard into regular garbage) and other PPE, and take the waste bag containing the mercury to the hazardous waste storage room (225).
17. Return the unused components of the mercury cleanup kit to the spill kit station of Level 4. Alert the spills officer (Kamrul Zaman) that the kit has been used, so he can check if any components need replacing.
18. Let other workers know that they can return to the area.
19. Replace mercury thermometer with non-mercury alternative wherever possible.
20. Record incident via the RiskWare system. This is especially important if any people have come into direct contact with the liquid mercury, or if the mercury has been heated and released vapour, or if you suspect mercury has been released to the environment (e.g. via floor drain), or if you believe the cleanup operation above was not fully successful or complete.

Section 4 - Material safety data sheets (to be available and accessible)

1. Mercury (elemental mercury / metallic mercury / Hg⁰)

Section 5 - References

1. www.mercurysafety.com

SOP Consultation, Training and Approval

Print names and enter signatures and dates to certify that the persons named in this section have been consulted/trained in relation to the development and implementation of this Standard Operating Procedure. WHS Representative (WHS Committee) certifies that consultation has taken place.

Position	Name	Signature	Date
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