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1. PURPOSE

This SOP outlines the emergency response procedures in case of chemical spill.

2. SCOPE

This SOP is applicable to all lab users.

3. RESPONSIBILITY

3.1 It is the responsibility of the PI in conjunction with the departmental Safety Committee to ensure the following:

a. Review of Safety Data Sheets for all chemicals used in the lab.

b. Acquire sufficient quantities and types of appropriate spill control materials.

c. Acquire recommended personal protective equipment.

d. Ensure all lab users receive appropriate chemical safety training.

e. Discuss this SOP with all lab users.

3.2 It is the responsibility of all lab users to acquire sufficient knowledge in chemical safety and to follow this SOP in case of emergency.

4. PROCEDURES

4.1 Safety First

Chemical spills present hazards through contact to skin and eyes or through inhalation of vapours. Hence, taking personal protective measures is always the first step in responding to chemical spills.

a. Immediately alert area occupants, floor leaders, PI or lab supervisor and safety committee.

b. Evacuate the area if spill control resources are insufficient to effectively contain the spill. Inform Campus Security, the Faculty Safety Officer and OSHE as necessary.

c. Isolate spills that are small enough to be contained by lab personnel.

d. Secure the scene (use barrier tape if necessary) and restrict admission to only those persons cleaning up the spill.

e. Attend to any people who may be contaminated. Wash contaminated skin with water for no less than fifteen minutes. Use the emergency shower if necessary.

f. If a volatile, flammable material is spilled, immediately warn everyone, remove sources of ignition and ventilate the area.

g. Access the Spill-X Chemical Spill Treatment Kit.

h. Put on personal protective equipment: a lab coat, safety goggles and pair of rubber gloves included in the Spill-X Chemical Spill Treatment Kit.

4.2 Identify Spill

a. Identify the type of spill from its labeling or its Safety Data Sheet. Determine if the chemical is a(n):
   Acid
   Caustic
   Solvent
   Mercury

b. Review the substance's SDS to see if additional bodily or respiratory protective measures may be required and what first aid steps should be taken in case of spill contact.

4.3 Select Spill Control Reagent

a. The wall-mounted Spill-X Chemical Spill Treatment Kits located at the Department of Biochemistry contain the following Spill Control Agents:
   Spill-X-A for Acids
   Spill-X-C for Caustics
   Spill-X-S for Solvents
   Tube of Powdered Sulfur for Mercury Spills

b. Using the Spill Kit Treatment Guide included within every spill kit, evaluate agent suitability for spill size and type. **Do not use any agent on substances other than those listed for that agent in the Chemical Spill Treatment Ratio Table.**

4.4 Treat Spill

a. Remove safety seal from inside reagent bottle cap.

b. Begin spill treatment by pouring reagent around spill to encircle and dike its perimeter.

c. Taking care to avoid splashing, continue to apply agent evenly onto the spill.

d. Using scraper provided, carefully mix reagent into spill for the most complete reaction.

e. If spill is corrosive, any neutralization reaction will subside after a few minutes leaving a paste-like residue.

f. If spill is a solvent, agent adsorption is indicated by the disappearance of free liquid.

4.5 Small Mercury Spill

a. Mercury is a silver colored metal known to be toxic to humans. The two primary routes of exposure which pose the greatest personal risk are direct contact with skin and breathing in mercury vapours.

b. If the spill is onto or within a heated surface, do not attempt to clean up the spill. Instead, turn off the heat-producing device. If possible turn on fume hoods or open windows to ventilate the area, have all personnel leave the room, and shut the door. Placard the door(s) to the room with the following words, "Mercury Spill-Do Not Enter."

c. Do not use a broom to sweep up the mercury. It can break the mercury into smaller beads, spreading them.

d. Do not pour mercury down the drain. You may contaminate the plumbing, septic system or local sewage treatment plant.

e. Do not wash mercury-contaminated clothing, rugs or other fabrics in the washing machine. The washing machine and waste water may become contaminated.

f. Dispose of any contaminated cloths, fabric or footwear by placing them in a plastic bag for disposal. Seal all bags. Store the bags in a container in a safe place while awaiting disposal.

g. To treat a small mercury spill, put on nitrile gloves first.

h. Sprinkle powdered sulfur over the spill area. Powdered sulfur keeps the mercury from volatilizing.

i. Pick up any broken glass with a tweezer, and place the pieces in the sealable bag.

4.6 Restore Area

a. Spill-X-A and Spill-X-C agents work as acid/base neutralizers respectively. Test representative samples of spill residue for final pH. Follow the procedure given in the Spill Kit Treatment Guide.

b. Spill-X-S agent adsorbs solvent onto a carbonaceous matrix. Final spill residue should be dry and powdery.

c. The applied sulfur to a mercury spill will turn from yellow to brown as it forms mercuric sulfide.

d. Record spill type and treatment onto label of bag(s) provided.

e. After treatment reaction cools, use provided scraper and pan to pick up residue and place into labeled bag.

f. Rinse and decontaminate utensils and area, using a mild detergent and water, when appropriate.

g. Dispose of residue as chemical waste according to the Chemical Waste Disposal SOP (SOP-BCH-WVS-002).

5. RECORDS

5.1 Prepare a written report of the accident to the PI or lab supervisor, and file it in the lab's Accident/Incident Register.

5.2 Report the incident to OSHE online at:
https://staffweb.nus.edu.sg/oshe/submit_airs.htm

6. REFERENCES

6.1 Refer to NUS Safety & Health Manual/Chemical Waste Disposal.
(https://wws.nus.edu.sg/osh/nus_manuals/sop/SOP_CS01_Chem_Waste_Disposal.pdf)

6.2 Recommended Template for Incident/Accident Report.

(https://share.nus.edu.sg/corporate/procedures/safety_and_health/General/Template-for-incident-report.pdf)