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Hazardous Chemical Releases and Spills

Laboratory emergencies require prompt action to prevent or reduce undesirable effects. Laboratory employees must be able to immediately take control of the situation and quickly assess the existing and potential hazards, and carry out the appropriate response actions.

Immediate hazards of fire, explosion, and release of toxic vapors and gases are of prime concern. The following emergency response procedures contain minimum specifications that must be followed by all Montana Tech laboratory workers. In addition, written emergency response actions for specific hazards in the laboratory (such as skin contact with hydrofluoric acid) must be developed by the department, reviewed by EH&S, and provided to the laboratory workers. These written emergency response procedures must also specify the proper spill control equipment or material to be used.

Reporting Spills

Any chemical spill must be reported to Environmental Health & Safety immediately. The Chemical Spill Report Form must also be completed and sent to EH&S following the spill.

Assessing Spills

Persons causing simple spills are responsible for cleanup to the extent of their abilities and available personal protective equipment.

- A simple spill is defined as one that does not spread rapidly, does not endanger people or property except by direct contact, and does not endanger the environment outside the building. A simple spill can be neutralized, absorbed, or otherwise managed by the user of the chemical.
- No notification of emergency responders is necessary for simple spills. However, the Office of EH&S (4463) and Physical Facilities (4399) must be notified for cleanup and disposal issues.
- All other spills or releases should be considered high hazard emergencies, and Emergency Response Procedures should be followed (call 911 if necessary, contact a hazmat team if needed).
- Even a small amount of spilled flammable liquid or reactive substance presents a significant fire hazard. There are many spark sources in laboratories. Do not hesitate to evacuate, notify the fire department and pull the fire alarm system if you are unsure of the spill's fire potential. When in doubt, get out.
- Any uncontained chemical that can disperse fumes, gases, or dusts may be hazardous to your health and the health of those around you. If you suspect that the spilled or released chemical is toxic, evacuate that area. If others in the area could be exposed to the chemical, evacuate the area or building and follow the Emergency Response Procedures.

Spill Control Equipment

Where appropriate, each department must make available appropriate spill control items in each laboratory. Items may include commercial spill control products such as absorbent pads, pillows, rolls, booms, etc., and/or other suitable neutralizing or absorbing items such as sodium bicarbonate for acid spills, boric acid or citric acid for alkali spills, or activated charcoal for solvent spills.

Spill Control for Acids, Alkalis, and Solvents

As a general guideline, spills of less than 1 liter of these materials are considered small. However, spills of particularly hazardous substances, regardless of the amount spilled, may require immediate EH&S assistance. Particularly hazardous substances include select carcinogens, reproductive toxins and substances with a high degree of acute toxicity.

Whenever a spill occurs, treat the spill as a potentially dangerous situation until the spill is cleaned up or there are positive indications (for example, instrumental monitoring) that no hazard is present. Departments, in conjunction with EH&S, must develop spill response contingency plans to deal with potential releases of extremely hazardous materials that are used in their department.

The following are generic standard operating procedures for chemical spills or releases:

- Quickly assess whether there are any injured persons and attend to any person who may have been contaminated.
- If an emergency exists, follow the Emergency Response Procedures (calling 911 and/or hazmat team).
- Evacuate the immediate area until the hazardous release has been characterized and controlled. A spill of a hazardous chemical can produce a very dangerous situation or can be fairly minor, depending on many factors, such as chemical toxicity, physical state, vapor pressure, reactivity and temperature.
- In the event of a flammable spill, extinguish ignition sources on your exit route and remotely shut off electrical power to the laboratory, if possible.
- Close the laboratory doors after everyone has safely exited in order to control the potential spread of the release.
- Conduct clean-up of small spills (less than 1 liter) **only** if you have the proper spill control materials and personal protective equipment. CONTACT EH&S if you have any questions about what to use.
    - ◊ Wear personal protective equipment such as laboratory coats, eye goggles, face shield, and gloves that will provide chemical resistance protection. Latex surgical gloves do not provide adequate protection against most materials.
    - ◊ Respirators may be necessary even in a small spill clean-up, depending on the substance. **Only** those employees who are approved to wear respirators can attempt small spill clean-up requiring respiratory protection.
    - ◊ Use proper spill clean-up materials. Commercial pads, pillows, booms, rolls, etc. are available from several manufacturers, but vary in what substances they control. For example, many commercial absorbents cannot be used with a hydrofluoric acid spill clean-up. In addition to commercial products mentioned above, the following can be used:
        - ♦ Sodium bicarbonate for acid spills
        - ♦ Boric acid or citric acid for alkali spills
        - ♦ Activated charcoal for solvent spills

- ◊ Confine the spill to a small area. Do not let it spread. Dispose of all spill clean-up material in an appropriately marked hazardous waste container and label the contents.
- ◊ Fill out an incident report form and contact EH&S for follow-up and to arrange for proper disposal.

Mercury Spills

Mercury spills present a special problem because of the difficulty in picking up the tiny droplets and the hazards of undetected residues. Metallic mercury remaining in cracks and crevices will give off toxic vapors for years.

- Prevention is the best way to handle mercury. Trays or tubs should be used under equipment wherever a mercury spill is possible.
- Wear gloves when cleaning up mercury spills. Although the main exposure route is through inhalation, it can also be absorbed through the skin.
- Never use laboratory sinks or drains to dispose of mercury or mercury-contaminated waste.
- NEVER ADD MERCURY WASTE TO ANY OTHER WASTE OR VICE-VERSA. It all becomes mercury waste, which is very expensive to dispose of.

Small Mercury Spills

Small mercury spills are those spills of less than 5 milliliters.

- Pick up glass or other large debris, then pick up the spilled metallic mercury. You can use a side arm flask connected to a vacuum pump or sink aspirator to vacuum up small beads.
- Alternately, you can consolidate the spill by using a thin piece of cardboard or plastic. The mercury can be pushed onto another thin piece of cardboard or plastic and transferred to the disposal container.
- Use mercury spill powder, mercury absorbent paper or mercury sponges to decontaminate the area and clean up spill residues.
- Put the mercury into an airtight container labeled, "Waste Mercury."
- Glassware and other debris that cannot be cleaned will have to be sealed in a container and disposed of as hazardous waste. Contact EH&S.
- Glassware and other debris that are clean (no visible mercury) may be discarded in the normal trash.

Broken Mercury Thermometers

Put the mercury in an air-tight container labeled "Waste Mercury" or carefully wrap the sharp ends of the broken thermometer and place in a plastic bag, wide-mouth jar, or other puncture resistant container. Give to EH&S for disposal.

Large Mercury Spills

For mercury spills greater than 5 milliliters, including spills from manometers and barometers, call EH&S. EH&S has a vacuum designed specifically to clean up mercury spills.

Close off and post the area to prevent mercury or vapors from spreading.