



Lab Safety

Spectrum

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UW - Madison Safety Department
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Help Line 265-5518

Chemical and Radiation Protection
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Emergency Response

Seemingly, at the start of the academic year, more emergencies occur than in the late spring. While accidents are inevitable, it is important to understand the proper response. This newsletter will address emergency response. Space allows us to touch only briefly on the matter. Section E of our Chemical Safety and Disposal Guide discusses emergency response in greater detail.

In an accident, the first step is to prevent personal injury and then insure that the material involved in the accident does not spill out of the lab into areas where members of the public can be injured or the environment damaged. Given that, most accident situations can be broken into two broad classes: major and minor emergencies.

Major Emergency

A major emergency, often called a high hazard emergency, is a situation that presents an immediate threat to health, property or the environment and normally requires evacuation of the area and the assistance of outside specialists such as Police, the Madison Fire Department or the Fire Department's Hazardous Incident Team. A high hazard emergency includes situations like exposure to toxic substances, fire, or explosions.

In the event of a fire, pull the fire alarm *first*. Then, if you have been trained and the fire is very small (e.g., no bigger than a wastepaper basket), and you think you can extinguish it, attempt to extinguish the fire with an appropriate fire extinguisher. For fires in containers, often covering the container will extinguish the fire. If you extinguish the fire, inform the Police.

Some experiments have the potential to release tremendous amounts of energy and

labs have many fuel sources that can aggravate the emergency. An explosion (not just a pop) has the potential to be a major emergency. Beware of secondary explosions, fires, and spills or releases of toxic chemicals due to glass container damage triggered by the first blast.

Remember, first notify your supervisor and call Police (911). Identify yourself and the reason you are calling, the exact location of the emergency and the nature of the emergency, any injuries or symptoms involved, and the identity of any hazardous materials involved if you know them.

For situations that threaten fire or explosion, and spills in which hazardous vapors are present, evacuate the area. Close, but do not lock doors behind you to isolate the area. If you have time to do so safely, close fume hood sashes and post a sign to warn others not to enter the area.



Major Emergencies (cont.)

Similarly, if fire, smoke, gases or vapors are spreading to other areas pull the fire alarm to evacuate the building. Call Police (911) from a remote location and inform them of the spill.

Be available to advise emergency response personnel by identifying yourself when they arrive. Someone responsible for that room or building should be present to provide details of the incident to emergency responders. This individual should be able to identify the types and quantities of chemicals stored there, and their locations within the rooms.

Skin Contamination and Injuries

Work with potentially hazardous chemicals may lead to contamination and injury. Be aware of signs and symptoms associated with chemical intoxication. If a worker or student develops such signs or symptoms, they should be given an appropriate medical examination. If a spill, leak, explosion, or other occurrence results in the likelihood of a hazardous chemical exposure, affected workers should be given an opportunity for a medical consultation to determine whether there is a need for a medical examination.

Time is crucial in an emergency situation. You should know where the nearest eyewash and safety shower is located and remember that decontamination removes the source of injury.

Skin: For small spills on the skin, flush immediately under running water for at least 15 minutes, removing any jewelry that might contain residue while flushing. For small spills with no sign of a burn, wash the area with soap under warm running water. If pain returns after the 15-minute flooding, resume flooding the area. Be sure to wear personal protective equipment when providing assistance to a victim of chemical contamination.

Eye: For a chemical splash in the eyes, immediately flush the eyes under running water for fifteen minutes, holding the eyes open and rotating the eyeballs. This is best done in an eyewash fountain with properly controlled flow that allows for hands-free cleaning.

Hold the eyelids open and move the eye up, down, and sideways to ensure complete coverage. If no eyewash fountain is available, put the victim on his or her back and gently pour water into the eyes for fifteen minutes or until medical personnel arrive. If hydrofluoric acid is splashed in the eye, flush for five minutes and then irrigate the eye with a 1% solution prepared from calcium gluconate antidote gel.

Clothing: For spills on clothing, go immediately to a safety shower and while standing under running water remove all contaminated clothing, including shoes, undergarments and jewelry. Chemicals can be absorbed by clothing and continue to present an exposure danger. Removing saturated clothing promptly can greatly reduce the severity of a chemical burn. When removing shirts or pullover sweaters, be careful not to contaminate the eyes. Cutting off such clothing will help prevent spreading the contamination. To prepare for emergencies, shears (rounded-tip scissors) should be available in the first aid kit to allow safe cutting of contaminated clothing.

Hydrofluoric Acid spills: If the spill involves hydrofluoric acid (HF), wash and flush for only 5 minutes and promptly apply calcium gluconate gel and get immediate medical attention. This gel helps prevent permanent bone or tissue damage. If no gel is available, rinse for 15 minutes and Call Police (911) to have the victim taken to the emergency room for medical attention.

Check the MSDS to see if any delayed effects should be expected, and keep the MSDS with the victim. Call Police (911) to have the victim taken to the emergency room for medical attention. Be sure to inform emergency personnel of the decontamination procedures used prior to their arrival (e.g., flushing for fifteen minutes with water). Be certain that emergency room personnel are told exactly what the victim was contaminated with so they can treat the victim accordingly.



Simple Spills

A simple, or incidental spill is defined as a spill that does not spread rapidly, does not endanger people or property except by direct contact, and does not endanger the environment outside the building. University policy is that the persons causing simple spills are responsible for cleaning the spill within their capabilities. A simple spill can be neutralized, absorbed, or otherwise managed by the user(s) of the chemical. No notification of emergency responders is necessary for simple spills. However, the Safety Department must be notified and the Safety Department is always available for advice and assistance. Emergency phone numbers posted in labs include Safety Department personnel's home phone numbers.

Each lab is responsible for cleaning up spills. The Safety Department does not normally clean up simple chemical spills, but they are available for on-site advice and can lend spill cleanup supplies for the spills that may require special equipment. See below for special procedures for mercury spills.

Persons spilling chemicals or discovering chemical spills are responsible for assessing the spill and notifying the Safety Department or UW Police. Labs are responsible for cleaning up their simple spills. The Madison Fire Department's Hazardous Incident Team responds to more serious spills. They will respond, contain it and insure it presents no further hazard to life or the environment. However, they will not clean any spill. After the emergency responders leave, lab personnel will still be responsible to clean up the spill.

Alert persons in the area that a spill has occurred. This will insure that the lab's attention can be focused on the immediate issue, cleanup.

Is this a major or minor spill? Evaluate the toxicity, flammability, and other hazardous properties of the chemical as well as the size and location of the spill to determine whether evacuation or additional assistance is necessary.

Prevent the spread of contamination and contain any volatile material within a room by keeping doors closed. Increase exhaust efficiency by minimizing sash height of the chemical fume hood.

Read the MSDS, the laboratory emergency plan, procedures in this guide, or call the Safety Department for correct cleaning procedures. Wear protective equipment (e.g., goggles, apron, laboratory coat, gloves, shoe covers) that is based on the type of hazard.

Cordon off the spill area to prevent inadvertently spreading the contamination over a much larger area. Then absorb liquid spills using paper towels, spill pillows, Floor Dry, or sand. Place the spill pillow over the spill and draw the free liquid into the pillow. Sprinkle vermiculite or sand over the surface of the free liquid. Place the used pillows or absorbent materials in plastic bags for disposal along with contaminated disposable protective equipment (e.g., gloves). Neutralize spills of corrosives and absorb, if appropriate. Sweep up waste and place in plastic bags for disposal. Call the Safety Department for advice on how to dispose of the material and complete a report describing the spill response. Send a copy of this report to the Safety Department.

Remember, call Safety if you have any questions of how to respond to a minor spill. Major spills should be reported first via 9-1-1.

Hydrofluoric acid requires special considerations. Some spill pillows cannot be used with hydrofluoric acid (HF). If you use hydrofluoric acid, buy spill pillows specially made for hydrofluoric acid or use a neutralizing agent for cleanup. Sodium carbonate, sodium bicarbonate and sodium hydroxide are suitable neutralization agents for hydrofluoric acid.

Mercury is the single most spilled chemical on campus. It presents 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 spills. Trays should be used under equipment wherever a mercury spill is possible. The Safety Department will exchange mercury thermometers for non-mercury ones, call Kurt Kellesvig at 2-9644. Wear gloves when cleaning up mercury spills. Although the main exposure route is through inhalation, it can also be absorbed through the skin.

Small mercury spills are those spills of less than 5 milliliters. First, 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. Alternatively, 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 into the disposal container. Use mercury spill powder, mercury absorbent paper or mercury sponges to decontaminate the area and clean up spill residues. A recipe for mercury spill powder is provided in the disposal guide and commercial kits and equipment are available for mercury spills.

Put the liquid mercury into an airtight container labeled, "*Waste Mercury*" (scintillation vials work well).

Debris that cannot be cleaned should be called in for pick up by the Safety Department. Glassware and other debris that are clean (no visible mercury) may be discarded in the normal trash. For mercury spills greater than 5 ml, including spills from manometers and barometers, call the Safety Department. The Safety Department has a mercury vacuum cleaner and will help you clean the spill.

Training

Chemical and Radiation Protection has two training classes. The Chemical Safety Training class begins at 9:30 on the same day as the Radiation Safety Training class which begins at 12:30. The training schedule from 1 September through 21 December (all classes are held at Union South) September 4, 13, 19, 25; October 1, 9, 17, 25; November 6, 14, 20, 28; and December 6, 12, 21. There is no sign-up; merely show up on one of the scheduled class dates. Booklets and schedules can be picked up at room 19, Biochemistry from 11 - 2:30. The quiz used to document training is given the last hour of the class and usually begins about 11 AM for Chemical and 3:15 PM for Radiation. For a complete schedule see our web site

<http://www.fpm.wisc.edu/safety/Radiation/schedu.html>

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