

VIII. Emergency Response

The proper response to an emergency situation is essential. An inappropriate response can lead to a situation far more hazardous than the original emergency. Some, though not all, chemical spills and fires will require outside assistance. The following sections are intended to provide guidance in emergency response. For smaller, lab fixture related emergencies (hoods, sinks, electricity, etc), please contact the Director of Operations for the Department of Polymer Science.

A. Evacuation

The building emergency alarm system can be activated in the event of an emergency requiring building evacuations such as a fire or major chemical spill. Any time the building alarm sounds, evacuation of the building is mandatory. If there is no alarm sounding but a police, fire or haz-mat official tells you to evacuate you are required to leave the building. Failure to evacuate when requested by authorities can result in arrest. Evacuate by the nearest exit and stay off of the elevator. Move away from the building. Do not return to the building until the police, fire official, or a member of the haz-mat team gives the all clear.

B. Fires

Fires in areas where there are chemicals are potentially very dangerous. Besides the rapid spread of fires in areas where there is a large quantity of stored chemicals and the potential for explosions, there is always the possibility of producing highly toxic unknown vapors during chemical fires. Approaching chemical fires must always be done with extreme caution. While it is University Policy that personnel are not required to extinguish fires, appropriately trained personnel may attempt to extinguish fires under certain conditions. All Department of Polymer Science laboratories are equipped with dry chemical extinguishers and most laboratories are also equipped with carbon dioxide extinguishers. Personnel should only attempt to extinguish fires under the following conditions:

1. If it is safe to do so.
2. If the person know how to use a fire extinguisher.
3. If the appropriate fire extinguisher is available.
4. If the fire is small and isolated.
5. If the person is familiar with the hazards in the area.
6. If there is no possibility of being exposed to toxic fumes.
7. If there is no potential for explosions to occur.

Use and Types of Fire Extinguishers

There are different types of fire extinguishers available. Not all fire extinguishers are suitable for all types of fire. Be sure you are using the proper extinguisher for the type of fire. In attempting to extinguish a fire make sure that it is safe to do so and remember that an extinguisher is only a first aid tool and should not be used to control large fires. Fire extinguishers are intended for small isolated fires only. The extinguisher only has about 10 to 30 seconds of spray and is only effective over a short distance of about 5 to 10 feet. In using a fire extinguisher, make sure that the exit is always within reach. Be careful not to trap any persons on the other side of a fire. It is

best to have more than one individual present when attempting to extinguish a fire. Do not take any chances. It is helpful to remember the acronym "P.A.S.S." when using an extinguisher.

P Pull the Pin

A Aim at the base of the flames

S Squeeze the trigger while holding the extinguisher upright

S Sweep from side to side

Whenever a fire extinguisher is discharged it should be inspected and recharged. Discharged fire extinguishers must be taken to the Departmental Stockroom for replacement. Facilities Management inspects and tags fire extinguishers annually. Individuals are not required to fight chemical fires and have the right to call 911 and activate the building alarm.

Emergency Response to Fires

If there is a fire in an individual's laboratory or work area, the first concern should be for the safety of all individuals in the area. The area should be evacuated immediately regardless of who attempts to extinguish the fire. In the event of a fire:

- Remove all personnel from the area of immediate danger.
- Attend to any victims only if it is safe to do so.
- Confine the fire by closing all doors and windows to the area.
- From a safe area DIAL 911. Inform the emergency operator where the fire is and whether there is smoke odor, visible smoke or visible flames. Inform the operator of other hazards in the area.
- Active the building alarm at the nearest manual alarm station.
- Only attempt to fight the fire if it can be done safely.
- Report all fires to the main office.
- Evacuate the building by the nearest exit.

C. Chemical Spills

It is always possible for a chemical spill to occur in a laboratory even when following all the chemical hygiene rules and working safely. Most of the time, spills in the laboratory involve relatively small quantities of materials. However, even small amounts of highly toxic or highly reactive materials can be life threatening and dangerous. Laboratory personnel can clean up some spills. However, there are a number of circumstances that indicate that outside assistance should be requested. If there is a chemical spill in the work area or if a spill is discovered in another area, the first concern should be for the safety of all individuals. Regardless of the size of the spill, all persons in the vicinity of the spill should evacuate the area. Notify any neighbors that there has been a chemical spill. If any one has been injured, remove them from the spill area if it can be done safely. Do not enter an area where there are toxic gases or vapors. If a person cannot evacuate an area where there has been a spill call 911 immediately. Confine the spill as best as

possible without exposing any persons to fumes. As the area is evacuated, shut off any electrical equipment if it is safe to do so. If possible establish exhaust ventilation and open windows. Be sure to vent fumes only to the outside of the building. Close the fire doors as this will help to confine the spill. After individuals have been evacuated and the spill confined, it will be necessary to assess the situation and decide if outside assistance should be requested or if it is safe for laboratory personnel to cleanup the spill. Caution should be used in making this judgment.

Assessing the Spill

Laboratory personnel can cleanup low hazard level spills. Low hazard level spills are those spills that do not spread rapidly, do not endanger people and do not endanger the environment. All other spills are high hazard level spills and require outside assistance. The existence of a number of conditions indicate that outside assistance should be requested as suggested below:

- Spills involving medical treatment – CALL 911
- Spills involving fire or explosion hazards
- Spills that are potentially life threatening
- Spills occurring after hours CALL EHS 330-972-7123
- All spills larger than one pint (half liter)
- Spills involving any amount of highly reactive or toxic material
- All metallic mercury spills
- Spills involving unknown materials
- Spills for which you do not have the proper training or protective equipment
- Spills for which you have any questions or doubts

If none of the above conditions exist, laboratory personnel can clean up the spill. Otherwise call either 911, or EOHS as outlined above. In either case, inform the main office. An [incident form](#) must be filled out for all spills regardless of who cleans it up.

Reporting the Spill

When reporting a spill to 911 or EOHS, information about the situation will be requested. This information is necessary so that a proper assessment of the spill can be made and includes:

- Name, telephone number and location
- Location, time and type of incident
- Name and quantity of material involved
- Extent of any injuries
- Possible health and environmental hazards
- Other hazards in the area such as large quantities of stored chemicals, radioactives, biohazards etc.
- Safest route of approach to the incident

While waiting for emergency responders, the spill area will have to be secured. Block off entrances to the area by both locking doors and posting signs, taping or roping off stairwells and

elevators or posting staff by commonly used entrances. Any persons securing the area must remain at a safe distance from the spill.

Release of Toxic or Explosive Material

In the event of a release of toxic or explosive materials, it is best to evacuate the entire building. For example, if an individual is working with any of the inhalation hazards given on the prior approval list and there is a release the building should be evacuated. These materials are highly acute toxins and can be life threatening. Any spills of volatile highly acute toxins that cannot be confined (for example, in a hood) also require building evacuation. For releases of toxic or explosive materials or for any situation that in one's professional judgment requires total evacuation, the immediate area should be evacuated and from a safe area call 911 and activate the building alarm. The emergency should be reported to the main office.

Chemical Spill Cleanup

For high hazard spills either EOHS or the fire department will clean up or stabilize the spill. High hazard spills are those that present fire, health or reactivity hazards. If assistance has been requested from EOHS, and it has been determined that the spill can be safely cleaned up by laboratory personnel, they will provide advice on how to safely clean up the spill. When cleaning up a low hazard spill the proper clean up procedure must be known. If experimental work has been properly planned, this information should be readily available. The appropriate personal protective equipment should be worn and any hazardous waste should be disposed of appropriately. The following guidelines are intended to aid in chemical spill cleanup:

1. The spread of dusts or vapors can be prevented by closing the laboratory door and increasing the ventilation (for example, through the fume hood).
2. The spread of a liquid spill can be controlled by making a dike around the edges of the spill using absorbent materials such as vermiculite or spill pillows.
3. Special absorbents are required for some chemicals such as hydrofluoric acid and concentrated sulfuric acid.
4. If flammable liquids are spilled, remove all potential sources of ignition if it can be done safely.
5. In cleaning spills involving direct contact hazards, select personal protective equipment resistant to the chemical. It is a good idea to wear two sets of gloves.
6. Acid spills can be neutralized with soda ash or sodium bicarbonate.
7. Base spills can be neutralized with citric acid or ascorbic acid.
8. Cleanup residues should be placed in a plastic bucket or other suitable container and disposed of.

D. Power Outage

While a power outage is generally not thought of as being an emergency, hazardous situations can develop if there is a loss of power. When there is a power loss, fume hoods and the ventilation system will not necessarily function properly. If one is in the process of an experimental procedure and there is a power outage, there is the risk of toxic vapors accumulating. The situation can easily become hazardous. In the event of a power outage:

1. Close fume hood sashes. No work is allowed in fume hoods.
2. Be certain that the caps are on all bottles of chemicals.
3. All non-essential electrical devices should be turned off.
4. Explosion proof refrigerators and freezers should be left on.
5. The doors of refrigerators and freezers should be kept closed.
6. Turn off all gas cylinders at the tank valves.
7. Check all cryogenic vacuum work, distillations and glove boxes used for airless/moisture-less reactions and all reactions in progress.
8. All non-essential staff and students must leave the building.

E. Injury

In the event of an injury:

1. If the injury is minor, students should go to the [Student Health Service](#) (Rm 260 in the SRWC) ACCOMPANIED BY ANOTHER PERSON.
2. In case of serious injury, DIAL 911 and describe the injury and your location.

F. Group Contact

In the event of an emergency (power outage) during off-peak hours (later in the evening or on weekends) the group email list will be used. It is everyone's responsibility to email the group if an emergency occurs in the lab that will affect equipment and instrumentation.