

# Chemical Emergencies, Exposures, and Spills

## First Aid Procedures for a Chemical Exposure

### **Eye Contact:**

If a chemical has been splashed into the eyes, immediately wash the eye and inner surface of the eyelid with copious amounts of water for 15 minutes. Check for and remove any contact lenses at once. Seek medical attention immediately.

### **Ingestion:**

Consult [SDS](#), a chemical first aid manual or call the Florida Poison Information Center: 1-800-222-1222.

Follow directions and seek medical attention immediately.

### **Minor Skin Contact:**

Promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention.

### **Major Skin Contact:**

If chemicals have been spilled over a large area of the body, quickly remove all contaminated clothing while using the shower. Repeat if pain returns. Wash off chemicals by using a mild detergent or soap and water, do not neutralize chemicals or apply salves. Seek medical attention immediately.

### **Fire**

If clothing is on fire, help the individual to the floor and roll him around to smother the flames. If a safety shower is immediately available, douse the person with water; running to a remote shower will only fan the flame.

Fire blankets are primarily used as a first aid measure for prevention of shock rather than against smoldering or burning clothing. A fire blanket may direct flames toward the face.

### **Note:**

Remember that for some chemicals, such as hydrofluoric acid, effects resulting from exposure may not become apparent until hours or days later. Consult the SDS for any chemical to which someone has been exposed, even if no immediate injury is apparent.

## Handling of a Chemical Spill

### **EVALUATE THE CHEMICAL SPILL**

- Large or extremely dangerous spills - **CONTACT EH&S FOR HELP**
  - Spills that present an immediate hazard (fire, explosion, chemical exposure, etc.)
  - Any spill of highly dangerous chemicals
  - Moderate or large-scale chemical spills
  - If the spill is large or if you're unsure how to classify it, call for help.
- Small, incidental spills
  - Spills that can be cleaned up by lab personnel without putting themselves or others in danger.

- If you're confident lab staff can handle the spill safely, see below.

#### **COMPLETE THESE STEPS ONLY IF SAFE TO DO SO**

- Alert all persons nearby. Acquire assistance, if needed.
- If you understand the properties of the chemical and know how to safely clean it up and the amount spilled is small, proceed with cleaning. For information on chemical properties or reactivities, go to <http://cameochemicals.noaa.gov/> or check the SDS at <http://hq.msdsonline.com/fsu3707/SafetyCenter/Default.aspx>
- Wear appropriate PPE, including eye protection, gloves and lab coat and other PPE if needed. Prevent spread of dusts and vapors – close laboratory door to increase exhaust through fume hood.
- Neutralize acids and bases if you have an acid/base spill kit. Avoid contact or splashing during neutralization.
- Control the spread of liquid – make a dike around outside edges of the spill. Use absorbent materials such as vermiculite, cat litter or spill pillows.
- Absorb the liquid – Add absorbents like vermiculite or cat litter to the spill, working from the edges toward the middle. Special absorbents are required for hydrofluoric and sulfuric acids.
- Gently sweep solid chemicals (do not make airborne).
- Decontaminate the area and equipment with a safe, compatible solution.
- Collect and clean up residues – materials should be placed in a hazardous waste container provided by EH&S or in a compatible container to be transferred to a hazardous waste bucket when available. Label all waste containers for chemical content.
- Properly package and label as hazardous waste. Contact EH&S at 644-0971 or 644-7682 for waste disposal or go to the [online hazardous waste disposal form](#) (FSUID required).
- Wash hands after cleanup.
- Report spill to supervisor and EH&S of highly toxic or hazardous chemicals.

#### **Flammable liquids spill**

Protect personnel with appropriate PPE, remove sources of ignition including spark-producing equipment; use spill absorbent or spill pillows; ventilate the area; if spill cannot be absorbed quickly, evacuate all personnel and contact EH&S.

#### **Volatile toxic compounds**

Protect personnel with appropriate PPE; use a spill pillow or similar absorbent that does not produce dusts; ventilate area and decontaminate work area before resuming work. Contact EH&S for guidance or assistance by calling 644-6895.

#### **Corrosive chemical spill**

Direct contact hazard – protect personnel with appropriate PPE, double-glove; use neutralizing agent if available (sodium bisulfate for alkalis – sodium carbonate or bicarbonate for acids); use compatible absorbent material (not paper) such as vermiculite; scoop and contain materials for disposal.

#### **Mercury spill**

Isolate spill and call the Chemical Safety Office for assistance at 644-644-7682 or 644-6895.

### **Hydrofluoric acid spill or exposure**

Call for emergency medical response. Exposed area should be thoroughly flushed with water. Calcium gluconate cream should be applied to exposed skin. Assisting personnel must wear gloves while applying cream. Exposed lab workers should seek medical treatment/follow up, even if no symptoms are experienced. (Emergency response procedures for posting and first aid cream are available from EH&S. Contact the Chemical Safety Office at 644-7682 or 644-6895 for information.)

### **Reporting a Large Chemical Spill (Releases to the Environment)**

If a spill is relatively large, or involves a highly toxic material, a carcinogen or highly flammable material, contact EH&S for assistance in cleaning up the spill and disposing of the hazardous waste resulting from the cleanup.

#### **IF THE SPILL IS TOO LARGE OR HAZARDOUS TO CLEAN BY YOURSELF**

- Avoid breathing vapors of the spilled material.
- If safe, extinguish all sources of ignition
- Evacuate all occupants from the area and close the door to the laboratory facility.
- Immediately notify your supervisor of the incident.
- During regular work hours (Monday through Friday, 8 a.m. to 4:30 p.m.), contact EH&S at 644-6895 or the Chemical Safety Office at 644-7682 or 644-0971. On weekends, holidays and after 4:30 p.m., contact FSU Police at 911 for advice and assistance. Be prepared to provide the identity, amount and location of the spill, as well as your location and a phone number where you can be reached (not your lab phone, since you should not remain in the lab after the spill).
- If hazardous conditions develop (toxic vapors, fire or explosion risk), evacuate all occupants and call 911
- If there is a risk of spreading into the environment, call EH&S for assistance. Block drains or doorways if safe to do so, and call EH&S for assistance.

For information or assistance, call the Chemical Safety Office at 644-7682 or 644-6895.

### **Chemical Spill Prevention Planning**

#### **Written spill plan**

Hazardous chemical spills can be handled effectively when plans of action have been developed. Spill procedures should include the following:

- the potential location of possible spills;
- the quantities of material that might be released;
- chemical and physical properties of the material. This information may be obtained from the [Safety Data Sheets](#), label and other sources.
- hazardous properties of the material (consult the [SDS](#));
- the types of personal protection equipment that may be needed for cleanup;
- location and contents of spill kits that should be made available where possible. These kits might include the following:

- neutralizing agents such as sodium carbonate, sodium bicarbonate for acids or sodium bisulfate for bases
- absorbents such as vermiculite, "super sorb," or absorbent pillows or dikes. Paper towels, rags and sponges may be used, but caution should be exercised because some chemicals may ignite upon contact with them;
- plastic scoops and shovels, disposable mops, disposable protective clothing and containers to receive the spilled material and all items used in the cleanup
- waste container for disposal of contaminated clean up materials

**General laboratory practices:**

- Eliminate clutter; keep bench top clear
- Remove trip hazards
- Have all materials ready for process
- Take care when walking through doorways with open chemicals, hot or cold materials
- Utilize safer chemicals where possible see: <http://www.americanbiosafety.com/chemSol.htm>

**Proper storage:**

- Sturdy shelves with lip; proper design of storage area
- Compatible chemicals stored together
- Large containers stored close to the floor
- No storage on the floor
- Minimal storage on the lab bench
- Periodic inspection of storage areas

**Chemical Transport:**

- Use sturdy laboratory carts
- Use safety containers and secondary containment
- Use of rubberized buckets
- Use of straps to secure containers
- Chemicals may be moved only by properly trained lab workers
- Use of freight elevators

**Transfer of chemicals between containers:**

- Pay attention to container size...don't overfill
- Provide spill containment or absorbent paper
- Bond and ground containers where flammable liquids are involved
- Use of compatible container materials (all secondary containers must be labeled)

**Equipment and safety devices:**

- Check equipment for proper function of valves, hoses, etc.
- Secure tanks and gas containers
- Do not leave hazardous operations unattended

### Spill Kits

---

#### Additional Information and References

- Prudent Practices in the Laboratory : Handling and Management of Chemical Hazards, Updated Version (2011) The National Academies Press, National Research Council.
- ["The Lab Standard" – OSHA– Occupational Exposure to Chemicals in Laboratories \(29CFR 1910.1450\) – Appendix A & B](#)
- ["Right to Know" - OSHA Hazard Communication Standard \(29 CFR 1910.1200\)](#)
- NFPA30, 2003 edition, Flammable and Combustible Liquids Code – contact EH&S for copy.
- NFPA45, 2004 edition, Standard on Fire Protection for Laboratories Using Chemicals – contact EH&S for copy.
- NFPA55, 2005 edition, Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks - contact EH&S for copy.
- [EPA Waste Regulations \(40 CFR Part 261-269\)](#)
- ["Permissible Exposure Limits \(PEL's\)" OSHA Toxic and Hazardous Substances \(29 CFR 1910.1000 Table Z\)](#)
- 12th (2011 Edition) Report on Carcinogens - U.S. Department of Health and Human Services National Toxicology Program (NTP)
- [ACS Guide for Chemical Spill Response](#)