

## Guidance for Hazardous Waste Spill Cleanup in Laboratories

### Introduction

Chemical spills and accidents need to be minimized as much as possible. If a chemical spill should occur, a quick response with a stocked chemical spill kit will help minimize potential harm to personnel, equipment and laboratory space. This guidance document provides a list of the minimal equipment required for a spill kit. You may add equipment to the kit, provided all personnel are proficient in its use. An example would be adding a metallic mercury spill kit. Contact EHS for information and guidance in construction of a more specialized spill kit (for use with mercury, hydrofluoric acid, etc). The Principle Investigator or Supervisor should be responsible for reviewing their spill cleanup procedures with you, as outlined in the Chemical Hygiene plan.

Note that the majority of chemical spills can be prevented or minimized by:

1. Maintaining a neat and organized work area;
2. Performing a laboratory procedure review prior to conducting new experimental procedures;
3. Storing liquid chemicals in secondary containment bins;
4. Keeping reagent chemical containers sealed or closed at all times, except when removing contents;
5. Ordering reagent chemicals in plastic or plastic coated glass containers whenever possible;
6. Using secondary containment to store and move chemicals.

### Types of Spills that **Cannot** Be Handled by Laboratory Personnel

If the spill is too large for you to handle, involves more than 500 ml of any hazardous material, involves materials listed in the table below; is a threat to personnel, students or the public; or involves a corrosive, highly toxic, or reactive chemical, call EHS at 974-5084 or 911 for assistance.

Table 1: Chemicals that should not be cleaned up by laboratory personnel

Chemical Class	Example
<b>Strong Acids</b> - Any acid that is concentrated enough to fume or emit acid gases	Fuming Sulfuric Acid Red Nitric Acid Hydrofluoric Acid Perchloric Acid
<b>Strong Bases</b> - Any base that is concentrated enough to emit vapors	Ammonium Hydroxide
<b>Poison by Inhalation</b> - Any chemical that readily emits vapors / gases at normal temperature and pressure that are extremely toxic by inhalation	Phosphorous Oxychloride Titanium Tetrachloride Formates Isocyanates
<b>Reactive</b> - Any chemical that is sensitive to air, water, shock, friction and/or temperature	Dry Picric Acid Lithium Aluminum hydride Sodium Borohydride Phosphorus Metal Organic Peroxides
<b>Mercury</b> - Any mercury compound	Metallic Mercury Mercury Salts Aqueous Mercury Solutions
<b>Extremely Toxic</b> - Any chemical that is readily absorbed through the skin and is extremely toxic at small concentrations	Benzene Sodium Cyanide

### Types of Spills that **Can** Be Handled by Laboratory Personnel

Minor spills do not necessarily need the assistance of EHS. Laboratory workers who have had the proper training and possess the appropriate equipment can safely and effectively handle the majority of chemical spills that occur in the laboratory. In addition, spills involving multiple chemicals may pose various hazards. Always contact EHS if multiple chemicals are involved in a spill.

Except for the chemical classes in Table I, labs can handle spills involving one liter or less of liquid and one pound or less of a solid. If the spill is large, contact EHS to assist with the clean-up. Refer to the Hazardous Materials Safety Manual or the chemical spill section of the Chemical Hygiene Plan for specific spill clean-up techniques. Contact EHS with any questions or concerns about proper spill clean-up practices.

### **General Spill Clean-up Procedures**

In the event of a chemical spill, first decide if you are trained, knowledgeable and equipped to handle the incident. **Immediately evacuate the lab and call 911 if there is a possibility of an acute respiratory hazard present or if you need assistance to clean up the spill. Never proceed to clean up a spill if you do not know the hazards associated with the chemical or if you are unsure of how to clean up the spill. If anyone is injured or contaminated, call 911 and begin decontamination measures or first aid, if trained.**

Don the personal protective equipment from the spill kit; splash goggles and nitrile/Silver Shield combination gloves. Always ask a fellow researcher for assistance. They should also don splash goggles and nitrile/Silver Shield combination gloves. Make sure that all forms of local exhaust, i.e. fume hoods, are operating. It is normally not advisable to open the windows. If broken glass is involved, do not pick it up with your gloved hands. Use the scoop or tongs to place it in the bag, then place the bag in a strong cardboard box or plastic container. Follow the procedures provided below based on the class and type of chemical.

All tools used in the clean-up need to be decontaminated (plastic scoop, tongs, etc.). Remove all gross contamination with a wet paper towel. Dispose of the contaminated paper towels as waste. Rinse the tools off with copious amounts of water. Dispose of the gloves as waste. Dry the tools off and place back into the spill kit along with the splash goggles. Contact EHS to obtain replacement gloves and spill clean-up material.

### **Liquid Spills other than flammable liquids**

Spread the chemical spill powder over the spill starting with the edges first. This will help to confine the spill to a smaller area. Spread enough powder over the spill to completely cover the liquid. There should be no free liquid. Use plastic scoop to ensure that the liquid was completely absorbed by the powder. Pick up the powder with scoop and place in the polyethylene bag. Wipe the area down with a wet paper towel. Dispose of paper towel with the waste generated from the spill clean-up. Seal bag with tape and attach a completed UT hazardous waste label on the bag.

### **Flammable Liquid Spills**

Control all sources of ignition. Lay the chemical spill pads over the spill and allow them to soak up the material. Allow pads to completely soak up liquid. Pick up pads with tongs or other device that minimizes direct contact with a gloved hand. Place in a polyethylene bag. Wipe the area down with a wet paper towel. Dispose of paper towel with the waste generated from the spill clean-up. Seal bag with tape and attach a completed UT hazardous waste label on the bag.

### **Solid Spills**

Use the plastic scoop to place the spilled material into the polyethylene bag. Care should be taken so as not to create dust or cause the contaminated powder to become airborne. After the bulk of the material is cleaned up, wet a spill pad and wipe the area down. Place the pads into the polyethylene bag. Wipe the

area down with a wet paper towel. Dispose of paper towel with the waste generated from the spill clean-up. Seal bag with tape and attach a completed orange hazardous waste sticker on the bag.

**Note:** Precautions must be taken to minimize exposure to the spilled chemical. Be careful not to step in the spilled material and track it around. Contact EHS and 911 if an exposure to a chemical occurs.




Below is a list of the minimum items that should be included in a spill kit for your lab:

- 1 - 5 gallon pail with lid
- 10 - Universal Chemical Absorbent Pads
- 1- bag diatomaceous earth or vermiculite (do not use with hydrofluoric acid spills)
- 1- box baking soda
- 1- dustpan and brush
- 1- Plastic Scoop
- 10- Plastic Bags
- 2 - pair of Nitrile/Silver Shield Combination Gloves
- 2 - pair of splash goggles
- 5 - EHS Hazardous Waste Labels
- 1 - Laboratory Chemical Spill Clean-Up Procedure

You can either assemble your own spill kit or purchase one from a supplier, such as Fisher Scientific or Lab Safety Supply. Below are some suggestions for ready-made kits you can buy. Everyone working in the lab should know where the spill kit is located and how to use it properly.

For any questions about assembling a hazardous material/waste spill kit or questions about spills, please contact EHS at 974-5084.

Table 2: Examples of Ready-Assembled Spill Kits that can be purchased

Product	Description	Catalog #
	<p>Fisher Scientific Laboratory Spill Cleanup Kit:</p> <ul style="list-style-type: none"> <li>• One instruction sheet/MSDS</li> <li>• Two gloves</li> <li>• Two 9 x 16 in. (22.9 x 40.6cm) polybags</li> <li>• Two twist ties</li> <li>• Two blank shipping tags</li> <li>• One dust pan and brush</li> <li>• One bag vermiculite absorbent</li> <li>• Acid: One bottle neutralizing mixture (Calcium Hydroxide, Sodium Carbonate, Calcium Carbonate and Litmus Powder)</li> <li>• Caustic: One bottle neutralizing mixture (Citric Acid Anhydrous and Litmus Powder)</li> <li>• Solvent: 1 bag diatomaceous earth</li> </ul>	<p>Catalog # S80201A (Acid Spill Cleanup Kit) \$106.50</p> <p>Catalog #: S80201B: (Caustic Spill Cleanup Kit) \$100.50/ea</p> <p>Catalog #: S80201C: (Solvent Spill Cleanup Kit): \$100.25/ea</p> <p>All kits contain enough material to cleanup 1 liter spill.</p>
	<p>Fisher Scientific: Fisherbrand Chemical Spill Mini Spill Kit</p> <p>Each kit includes one carton Safety Sorbent particulate, one pair of side vent goggles, one pair gloves, two scraper cards for brushing up spills, one yellow disposal bag with tie.</p>	<p>Catalog #: 19-034-159 Case of 6 for \$127.15</p>
	<p>Lab Safety Supply Economy Spill Kit, 5 gal</p> <p>Spill Control Carry Bag Kit, Gallons Sorbed per Pkg. 5, Depth 4 In., Height 16 In., Dia. 20 In., Material Color Yellow, Universal, Standards Meets UN, Includes (10) 15 x 19 In. Pads, (2) 3 In. x 4 ft. SOCs, (1) Pair Nitrile Gloves, (1) Disposal Bag, (1) Instruction Sheet</p>	<p>Catalog #: 2GUS1: \$61.65/each</p>