Lab Spill Response Procedures and Spill Response Kit

The Laboratory Chemical Spill Clean Up Procedures were created to give researchers and laboratory personnel a starting point for developing a chemical spill kit and providing guidance for cleaning up chemical spills. 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. Outlined in Table 2, is 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.

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 Can Be Handled by Laboratory Personnel

Laboratory personnel can clean up the majority of chemical spills that occur in the lab. Due to the hazardous properties of certain chemicals or size of the spill, assistance from Huntsville Fire Department (HFD) may be necessary. The following table contains a list of chemical classes with examples that might require assistance from HFD.

Chemical Class	Example
Strong Acids - Any acid that is concentrated enough to fume or emit acid gases	Fuming Sulfuric Acid Red Nitric Acid Hydrofluoric Acid Perchloric Acid
Strong Bases - Any base that is concentrated enough to emit vapors	Ammonium Hydroxide
Poison by Inhalation - Any chemical that readily emits vapors / gases at normal temperature and pressure that are extremely toxic by inhalation	Phosphorous Oxychloride Titanium Tetrachloride Formates Isocyanates

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Reactive - 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
Mercury - Any mercury compound	Metallic Mercury Mercury Salts Aqueous Mercury Solutions
Extremely Toxic - Any chemical that is readily absorbed through the skin and is extremely toxic at small concentrations	Benzene Sodium Cyanide

Minor spills do not necessarily need the outside assistance. 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.

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 UPD to request assistance from HFD with the clean up. The following procedures are specific guidelines for using the recommended spill clean up materials.

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 notify UPD 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, immediately notify UPD 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 hazardous waste. Rinse the tools off with copious amounts of water. Dispose of the gloves as hazardous waste. Dry the tools off and place back into the spill kit along with the splash goggles.

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 hazardous waste generated from the spill clean up. Seal bag with tape and attach a completed orange hazardous waste sticker on the bag.

Flammable Liquid Spills

Control all sources of ignition. Lay the chemical spill pads over the spill. These pads are design to suppress the vapors emitted by a volatile liquid. 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 the polyethylene bag. Wipe the area down with a wet paper towel. Dispose of paper towel with the hazardous waste generated from the spill clean up. Seal bag with tape and attach a completed hazardous waste tag to 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 hazardous waste generated from the spill clean up. Seal bag with tape and attach a completed hazardous waste tag to 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.

Table 2: Chemical Spill Kit Minimal Requirements

Universal Chemical Absorbent Pads

• High Capacity
• Chemically Inert
• Absorbs aggressive chemicals as well as non-aggressive compounds such as water
• Good for all chemicals
  • Acids, including Hydrofluoric
  • Bases
  • Flammable Liquids
  • Formaldehyde
  • Organic Peroxides

Universal Chemical Absorbent Powder

• High Capacity
• Chemically Inert
• Absorbs aggressive chemicals as well as non-aggressive compounds such as water
• Good for all chemicals
  • Acids, including Hydrofluoric
  • Bases

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- Flammable Liquids
- Formaldehyde
- Organic Peroxides

Plastic Scoop

- Anti-Static
- Polypropylene Plastic

Polyethylene Bags

- Strong Construction
- Leak Proof
- At least 7-gallon capacity
- 4mm in thickness

Nitrile/Silver Shield Combination Gloves

- 0.011 thick Nitrile Gloves
- At least two pairs

Chemical Splash Goggles

- At least two pairs

Hazardous Waste Tags

- Refer to Hazardous Waste Program for proper disposal