

## Chemical Spills

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STAO Safety Committee Recommended Procedures.  
From September 1992 edition of 'Crucible' Volume 23.4

### GENERAL PRINCIPLES

It is the responsibility of all those working in a laboratory to be aware of potential hazards and to prevent them from becoming accidents. However, whenever chemicals are in use, there is a danger of spillage. A well organized science program will have available a general spill kit (see Table) as well as a special kit to deal with mercury spills. The science teacher must be fully acquainted with the properties and method of safe handling of all substances being used in the laboratory and must have access to the appropriate Material Safety Data Sheets (MSDS.) In the event of a chemical spill, it is important to warn others, render first aid if necessary, prevent further contamination or exposure, and contain and clean up the spill. If the spill results in body contact, or contamination of clothing, priority should be given to treatment of the person(s) involved. Teachers should not attempt to clean up major chemical spills, which involve a high degree of hazard. For these serious spills, students should be immediately evacuated from the laboratory. The area should be secured, warning signs should be posted, and the principal should be notified to initiate the required emergency procedures.

At the commencement of every science course, students must receive safety training, which includes procedures to follow should a minor or major spill occur.

### SPILLAGE OF SOLIDS

#### *Instructions*

- a) Advise all students to vacate the immediate area of the spill.
- b) Determine the degree of hazard before attempting clean up and take necessary preventative measures (i.e. protective equipment, eye protection, gloves, etc.).
- c) Gather up spilled solid using a dustpan and brush, taking care to avoid raising dust.
- d) Wipe the area with a damp disposable cloth.
- e) Determine appropriate disposal procedures as per Reg. 309.

#### **NOTE:**

Highly reactive solids, such as the alkali metals, are best gathered using tongs. Tongs should also be used for collecting white phosphorus, which should be doused with water during the operation. The affected area should then be treated with copper (II) sulphate solution.

### SPILLAGE OF FLAMMABLE LIQUIDS

#### *Instructions*

- a) Advise all students to vacate the immediate area of the spill.

- b) Determine the degree of hazard before attempting clean up and take necessary preventative measures (i.e. protective equipment, eye protection, gloves, etc.).
- c) Shut off all sources of ignition. Open windows.
- d) Cover the spill with mineral absorbent (e.g. cat litter or vermiculite).
- e) Scoop the contaminated absorbent into a heavy gauge polythene bag or plastic bucket and arrange for disposal as per Reg. 309.
- f) Mop the area of the spill or wipe with a damp disposable cloth.

## **SPILLAGE OF CORROSIVE LIQUIDS (Acids and Bases)**

### ***Instructions***

- a) Advise all students to vacate the immediate area of the spill.
- b) Determine the degree of hazard before attempting clean up and take necessary preventative measures (i.e. protective equipment, eye protection, gloves, etc.).
- c) For acid spills -- liberally sprinkle with sodium bicarbonate (baking soda) or sodium carbonate (soda ash) to completely neutralize the acid, test with indicator paper. For base spills -- liberally sprinkle with boric acid or citric acid to completely neutralize the base. Test with indicator paper.
- d) Scrape or sweep up the residue that remains after all reaction has stopped. Discard down the sink with an excess of water.
- e) Wash the spill area with water and wipe dry with paper towels.

### **NOTE:**

Small quantities of acid or base on the skin should be flooded with water. The method chosen to deal with spillage of concentrated sulphuric acid should depend on the quantity of acid spilled. If there is a danger that the heat produced could cause further problems, the spilled acid should be absorbed by a commercially purchased Spill Control Pillow.

## **SPILLAGE OF OTHER LIQUIDS (Except Mercury\*)**

### ***Instructions:***

- a) Advise all students to vacate the immediate area of the spill.
- b) Determine the degree of hazard before attempting clean up and take necessary preventative measures (i.e. protective equipment, eye protection, gloves, etc.).
- c) For water soluble liquids -- dilute and mop up using paper towels or cloths. For water immiscible liquids -- cover the spill with mineral absorbent (e.g. cat litter) to prevent spreading. Then scrape and mop into a suitable container for disposal. (Only very small bench spills should be treated by swabbing into a sink, and followed by flushing with large volumes of water).
- d) Wash down the spill area with water and wipe dry with paper towels.
- e) Thoroughly wash any contaminated cloths and/or mops or place in a suitable container for disposal.

*General purpose kit for clean-up in science:*

- \* plastic dustpan and brush heavy gauge polythene bags
- \* large plastic scoop 5 kg mineral absorbent (e.g. cat litter or vermiculite)
- \* plastic bucket 2 kg sodium bicarbonate (baking soda) or sodium

- \* protective gloves carbonate (soda ash)
- \* heavy duty apron 2 kg boric acid or citric acid
- \* full eye protection spill control pillows\*\*
- \* floor cloths (old rags)
- \* paper towels

\*\* Commercially purchased Spill Control Pillows can be used to absorb spills of hazardous chemicals. Applied directly, they will absorb and contain most spills within 30 seconds. The pillows contain an inert inorganic absorbent that is safe to use on flammable liquids, concentrated acids and bases. Spill control pillows are available to handle spills of varying sizes (e.g. 250 mL; 1.0 L and 4.0 L).

## References

1. Topics in Safety, Second Edition. (ASE, 1988).
2. Safeguards in the School Laboratory, Ninth Edition. (ASE, 1988).
3. Laboratory Safety Handbook, (CIC, 1987).
4. Flinn Chemical Catalog & Reference Manual, (Flinn Scientific Inc., 1992)
5. A Safety Handbook for Science Teachers by Everett K. & Jenkins E.W., Fourth Edition. (John Murray, 1991).
6. Ministry of the Environment Regulation 309. (1988).