

Discussion and Notes

Discuss the status of your department's inventory. How is it maintained? Does it need to be updated or improved? If your school does not have a current inventory, see the Safety section in your Flinn Scientific Catalog/Reference Manual for tips and resources. Flinn Scientific also has an easy-to-use computer software program called Chemventory to help you maintain an accurate and up-to-date inventory.

For complete details on how to properly store laboratory chemicals by compatible families, please see the Safety Reference articles in your Flinn Scientific Catalog/Reference Manual.

Safe Storage and Handling of Lab Chemicals

The science teacher's duty of care for planning and designing lab activities for the science curriculum includes the responsibility for the proper storage, handling, use, and disposal of chemicals in experiments and demonstrations. The following "Top Twelve" list of safety practices from Flinn Scientific will help you improve safety in the use of laboratory chemicals.

1. Carefully read the chemical label and Safety Data Sheet before using any chemical. Become familiar with the hazards, safety precautions, and personal protective equipment needed and do not use a chemical if you do not understand the hazards or the safety precautions for working with the material.
2. Any time chemicals, heat or glassware are used, you must wear chemical splash goggles and a chemical-resistant apron.
3. Have an approved eyewash station, fire blanket, and fire extinguisher in every laboratory or storage room where chemicals are stored and used. Inspect safety equipment on a regular basis and record all inspections.
4. Know what chemicals you have, how much you have, and where they are stored. A chemical inventory must be maintained.
5. Store all chemicals in a locked storage area designed for chemical storage. Do not store chemicals in the science classroom or laboratory. Protect your chemicals from theft!
6. Do not store chemicals in alphabetical order. Store laboratory chemicals by compatible families using the Flinn Scientific chemical storage system.
7. All flammable liquids and combustible materials must be securely capped and kept away from all sources of ignition or open flames. Good ventilation is a must.
8. Flammable liquids must always be stored in an approved flammables storage cabinet. Concentrated acids should be stored in an approved, all-wood acid storage cabinet. Severe poisons must be stored in a locked poison cabinet.
9. A spill kit containing dry sand, absorbent, and neutralizer should be readily available in all labs and chemical storage areas.
10. Before every laboratory activity or teacher demonstration, evaluate the educational value of the activity versus the hazardous nature and disposal of the chemicals being used.
11. Read the disposal recommendations for all chemicals or biological materials before the start of every laboratory activity. Prepare any materials needed for neutralization, sterilization, etc. of reaction byproducts or biological waste.
12. For chemicals with safe packaging and clear, easy-to-read labels, always order your chemicals and laboratory kits from Flinn Scientific. Flinn chemicals are also date-labeled so you always know the age of the chemical.

Following these twelve suggestions for the safe handling, storage, use, and disposal of chemicals will help you prevent accidents and improve safety in the school science labs.

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Keep a copy of these safety training notes and a signed attendance sheet to verify regular safety training. Regulatory inspectors will usually request proof of safety training.

Safe Handling of Acids and Bases

- ◆ Always add acid to water when diluting or mixing concentrated acids.
- ◆ The addition of acid to water is an exothermic reaction—use heat-resistant borosilicate (e.g., Pyrex®) glassware. When diluting concentrated sulfuric acid, place the beaker or flask in an ice bath to prevent splattering due to overheating.
- ◆ A great amount of heat is generated when solid sodium hydroxide or potassium hydroxide is mixed with water. The temperature may rise so fast that the water will boil. Use borosilicate glassware and place the beaker or flask in an ice bath to keep the mixture from overheating.
- ◆ Always thoroughly clean countertops after using acids or bases to avoid accidental exposure and possible chemical burns.
- ◆ Dispense concentrated acids in a fume hood and use a spill tray or mat to contain any spills. Use small reagent bottles for dispensing to reduce the potential for major spills.
- ◆ Use a bottle carrier to transport acids and bases from a storeroom to your laboratory.
- ◆ Do not store acids or bases in dropper bottles. The acid fumes will quickly degrade the rubber bulbs.
- ◆ When ordering acids or bases in 2.5-L containers, always specify that the chemicals be packaged in PVC-coated bottles. Should breakage occur, the spill will be contained.
- ◆ Purchasing dilute acid or base solutions is a safer alternative than preparing your own. Review the concentrations of acids and bases used in your science classes and plan your chemical purchases accordingly. What are your safety and time worth?

Flinn Scientific Values Your Support

Without your orders, the safety training notes and the indispensable *Flinn Scientific Catalog/Reference Manual* would not be possible. Please continue to support our efforts to improve safety in school science labs by ordering your science supplies and laboratory chemicals from Flinn Scientific.

Next Month's Topic

Chemical Disposal

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