

Discussion and Notes

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. A copy of the sign-up sheet that we suggest using may be found at www.flinnsci.com/forms/signup.aspx

Can you afford *NOT* to purchase concentrated acids in PVC-coated bottles?

Acid corrosion is *VERY* fast! Here is your chance to obtain a copy of the Safety Fax demonstration "[Acid in the Eye](#)" to show how quickly acid corrosion occurs.

Acid Safety

The purpose of this safety note is to review the safe purchase, storage, use, and disposal of acids.

Safety First!

Understanding the properties and hazards of acids is an important first step in using acids safely. Concentrated acids are strongly corrosive to all body tissue, especially eyes and skin. Hydrochloric and acetic acid are also toxic by inhalation. Wear chemical splash goggles, chemical-resistant gloves, and a chemical-resistant apron whenever using concentrated acids or acid solutions. Work with concentrated acids in a fume hood.

Purchase and Storage

- ◆ Purchase dilute acid solutions based on your needs. Dilute solutions are safer and easier to handle, store, and use. If the highest concentration you will use this year is 3 M, do you need reagent hydrochloric acid (12 M)? Consider your needs and plan accordingly!
- ◆ Purchase concentrated acids in PVC-coated glass bottles. The PVC coating forms a protective sleeve that prevents the acid from spilling if the bottle is dropped.
- ◆ Store acids in a dedicated corrosives or acid cabinet. To avoid overcrowding in the acid cabinet, purchase small quantities based on your needs.
- ◆ Nitric acid is a strong oxidizing agent. Concentrated nitric acid should be stored in a separate, liquid-tight compartment within an acid cabinet. Mixing nitric acid with glacial acetic acid, a flammable liquid, may release enough heat to ignite nearby flammable material.

Transporting Acids

- ◆ Check the bottle for cracks before touching an acid bottle or picking it up. Always carry 2.5-liter acid bottles with one hand underneath the bottle and the other hand around the neck or in the finger hole. This decreases the risk of hitting a sharp object, like a desk corner, and breaking the bottle. Wear gloves!
- ◆ Use a safety bottle carrier or plastic bucket when moving an acid bottle from the storeroom to the prep room or from one laboratory to another.

Using and Dispensing Acids

- ◆ Review the Safety Data Sheet (SDS) before using any hazardous material in the laboratory.
- ◆ *Remember:* Always add acid to water when diluting a more concentrated acid solution!
- ◆ Dispense concentrated acids in an operating fume hood. Good ventilation is especially important when working with hydrochloric, nitric or acetic acids.
- ◆ Have students dispense acid solutions from small bottles to limit spills and fumes. Place acid bottles on a lab mat or plastic tray to contain spills.
- ◆ Keep spill control materials (sand, absorbent, and neutralizer) readily available whenever concentrated acids or acid solutions will be used. Sodium carbonate is the preferred neutralizer for cleaning up acid spills.

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A fire blanket makes an ideal "modesty curtain" for use when a person must use the safety shower. Get the affected individual under the shower first, however!

Personal Protective Equipment

- ◆ Chemical splash goggles must be worn any time concentrated acids or acid solutions will be used.
- ◆ Acid-resistant nitrile rubber gloves are the best choice for use when handling concentrated acids.
- ◆ Operating eyewashes must be available in any classroom or laboratory where acids are used. An approved eyewash must treat both eyes simultaneously and provide clean, potable water for at least 20 minutes.
- ◆ Always wear a chemical-resistant apron or laboratory coat when working with acids. Acids are corrosive and will eat through most fabrics. This process may not occur instantly but rather over several hours and may not become apparent until clothes are washed.

First Aid

- ◆ Seek professional medical attention upon exposure to hazardous chemicals, especially concentrated acids.
- ◆ The best first aid for almost any chemical exposure to eye or body tissue is immediate dilution with water. If an acid is splashed in the eyes, use an eyewash to irrigate the eyes for at least 15–20 minutes. Similarly, if an acid is splashed onto bare skin, immediately rinse with water for 15–20 minutes.
- ◆ If a concentrated acid is splashed onto clothing, remove the clothing before acid can soak through the clothing and react with the skin. If an acid splashes onto skin and clothing, immediately rinse with water under the safety shower and then remove any affected clothing. Modesty must take a back seat to preventing potential chemical burns!

Disposal

- ◆ Elementary neutralization of acids and bases is a generally allowed method for treatment of chemical wastes. Always dilute and neutralize acids prior to drain disposal—do not rely specifically on dilution to reduce the reactivity of a chemical. Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures, and review all federal, state and local regulations that may apply, before proceeding.

Free Online Video Available!

Visit the Flinn Web site at <http://labsafety.flinnsci.com/Chapter.aspx?ChapterId=123&UnitId=9> to view the online video version of this Safety Training Note. The video is part of the comprehensive [Flinn Scientific Laboratory Safety Course](#). More than 30,000 teachers have already completed their online safety certification using this free professional development program.

Thank You for Your Support!

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Inquiry Safety and NGSS

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