



EH&S News

Environmental Health and Safety

University of Massachusetts at Amherst

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Chemical Safety

An article in *Chemical & Engineering News** revealed an unexpected reaction hazard in storing aqueous solutions of trichloroacetic acid. A 1/2-L capped bottle containing a 12% weight by volume solution of trichloroacetic acid in water with 30% methanol exploded violently after two years of storage at ambient temperature. The explosion caused several adjacent bottles to break. In several editions of the *Merck Index*, but apparently not elsewhere, it is stated that trichloroacetic acid is hydrolytically unstable in aqueous solutions less concentrated than 30% by weight. Such solutions are strongly acid (millimolar solutions have a 1.2 pH) and should not be stored. The decomposition products of such solutions include trichloromethane, hydrochloric acid, carbon dioxide, and carbon monoxide.

Assuming complete decomposition of 250 mL of the 12% solution at ambient temperature, the 4.5 L of evolved gases could have pressurized the free space in the bottle toward 19 bar, well above its likely bursting strength.

**Chemical & Engineering News* (26 May 1997) Vol. 75, No. 21, pp. 4.

How to Avoid Heat Stress

Heat stress can occur when an employee works in a hot humid environment while performing hard physical work over a long period of time. An employee who works under such conditions should consume enough water to avoid heat stress.

Before you begin a task, consult with your supervisor to determine what you can do to reduce the potential for heat stress.

Some of the things that can be done to avoid heat stress are:

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EH&S has a copy of *Brethericks* or you can look at a small portion of the articles on the American Chemical Society web site at:

<http://membership.acs.org/c/ccs/>

Click on the Chemical & Engineering News - Safety Newsletters at the bottom of the page.

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Summer Chemical Inventory

Summer months are good times to update the chemical inventory in your laboratory. Please take some time to go through your cabinets, shelves and refrigerators to pare down your inventory. EH&S will pick up items that you no longer need. All you have to do is to call us at 545-2682 or FAX us at 545-2600 or better yet, use our internet Web Page at:

<http://www.umass.edu/safety/>
to submit a pick up request.

If the chemical is a waste, submit a hazardous waste pick up request. If the container is unopened and no longer needed, it can become part of our re-cycling and re-use program. In either case call us for help.

While you're at it, be sure that your chemicals are stored compatibly. Appendix G, pg. 112 of the Laboratory Health and Safety Manual lists a partial guide to incompatible chemicals to help to keep the chemicals stored safely. The Lab Safety Manual can be viewed on line at our EH&S Web Site. The address is:

<http://www.umass.edu/safety/lhs.html>

Separate bases from acids, keep flammables separate and never store oxidizers near any organic materials. Also, make sure that there are flammable items stored in explosion proof refrigerators. If you need assistance or have any questions regarding safe laboratory practices, please contact Alesia Fugere, fugzoe@ehs.umass.edu, or Jim Field, jmfield@ehs.umass.edu. These housekeeping techniques will help keep your lab and its occupants safe.

Proper Dress in the Labs

It's that time of year again! The birds are singing, the temperature is rising. People are wearing shorts and sandals. WHAT!!! Shorts and sandals! Not in the lab, we hope. EH&S wants to remind everyone to wear appropriate clothing and shoes while working in the lab. If you wear shorts or a short skirt or dress, wear a lab coat that goes below the knees. Sandals, however, must never be worn in the lab! Spilled chemicals, broken glass or dropped items can lead to a serious injury. Leave a pair of sneakers or other full-covering shoes in your lab so you can comply with the recommended safe practices. A little forethought can prevent a lot of headaches, or foot aches in this case!

Reduce Odor Complaints in the Summer

Each summer EH&S receives requests to determine the source of odors in buildings with laboratories. In many instances the source of the odor complaint comes from a drain trap with no water. The problem can be eliminated by simply pouring water in the trap every other week to reduce the possibility of water evaporation from the trap. The purpose of the trap is to do exactly what the name implies. The water in the drain trap acts as a buffer between drain fumes and room occupants. When water is in the trap it stops the flow of fumes into a laboratory. So, take a few minutes to reduce the potential for an odor complaint.

Working with Hazardous Substances

At the University of Massachusetts many employees perform a variety of functions that require a person to handle, use or store a hazardous substance. Before any employee performs a task that involves the use of a hazardous substance, several things should be done:

1. Ask for a Material Safety Data Sheet (MSDS) to learn more detailed information about the product. The MSDS is an expanded label that is available from your supervisor.

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How to Avoid Heat Stress

When Possible, Work During the Coolest Times

Schedule tasks requiring the heaviest workload or the most PPE during the coolest part of the day.

Drinking Water Intake

Evaporation of sweat cools the body. Under the conditions that lead to heat stress, the body produces a large amount of sweat. Unless the water lost in sweat is replaced, body temperature will rise.

Drink enough water

Drink plenty of water before, during, and after work. Do not rely on thirst. A person can lose a dangerous amount of water before feeling thirsty, and the feeling of thirst may stop long before fluids are replaced.

Maintain weight

Be sure to keep body weight fairly constant. All weight loss because of sweating should be regained every day. People working in heat stress conditions should weigh themselves before work every day and keep weight constant by drinking plenty of water.

Scheduling

Work with your supervisor to determine the optimum work schedule to follow during heat stress conditions.

If you need assistance or want more information about heat stress call EH&S at 545-2682.

2. Read the label of the container to determine what precautions are recommended. The most common information on the label is: *"Use in a well ventilated area, do not ingest, and do not allow contact with skin."*

3. Ask your supervisor to provide more information on the correct ways to handle, use and store the product.

The Massachusetts Right to Know Law has regulations that require employers to communicate vital safety and health information to employees.

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One of the most important things that an employee can do is to be aware of signs and symptoms of overexposure. Many hazardous substances list some of the following symptoms: *"sore throat, dizziness, skin rash, lightheaded feeling and itchy eyes."* If those symptoms or others occur at work while working with a hazardous substance, read the label and the MSDS to see if the signs and symptoms of overexposure are similar to those that are experienced. If the signs and symptoms of overexposure are felt by an employee, there is a high probability that the cause of those symptoms may be related to exposure or overexposure to the hazardous substance. If there is an overexposure, the supervisor should be notified immediately. If medical attention is needed, obtain a copy of the MSDS(s) and show it to the medical professional to help with the diagnosis.

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HAZARDOUS WASTE DISPOSAL

Do you know how to properly dispose of all types of trash? It is now classified as either Hazardous Waste, Bio-Hazardous Waste, Radioactive Waste or just plain trash. Before you dispose of any materials be sure that you are following the recommended disposal process. Place the items in recommended or approved packages or boxes and place them in the proper disposal receptacle. For a Hazardous Waste Pick Up or to answer questions call 545-2682. There are many shops and art studios on campus that generate a variety of waste materials such as liquid solvents, saw dust, metal shavings, pieces of sheet rock, rugs and related materials. If you work in one of these shops, pay particular attention to the way you dispose of these materials. If you just throw them in with the regular trash, it creates a potential hazard for the custodian who moves the trash receptacle to the dumpster and has to inhale nuisance dusts and nauseous fumes. Once in the dumpster, the truck drivers have to empty them into the truck for disposal. They also do not want to be exposed to nuisance dusts, fumes, unpleasant odors and hazardous situations. Remember just because you haven't been hurt by your Hazardous Waste does not mean that someone else down the line will not be.
