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**Chemical
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Radiation
Protection**

Lab Safety

Spectrum

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UW - Madison Safety Department Chemical and Radiation Protection
30 N. Murray St. 262-8769 <http://www.fpm.wisc.edu/safety>

Help Line 265-5518

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Contaminated Lab chairs

If you work in a lab, you know that the material you work with can sometimes be spread and result in contamination of non-lab equipment (e.g., telephones, computers, etc.). We recommend all workers wear disposable gloves (as well as lab coat, safety glasses) when working with hazardous material and to remove the disposable gloves and wash their hands before handling other equipment so they can avoid the hand-mouth and transdermal cross contamination routes. Contamination can also be spread, through laboratory furniture, specifically your chair.

Think of it this way. You are probably working with hazardous and toxic substances and maybe even radioactive materials. Much of this is liquid in nature, some may be powders. Often persons are working with very small volumes. It is just possible that these same substances can dribble onto your chair and, if the chair is porous (e.g., fabric covered with sponge seat), it is possible to cross contaminate

yourself or one of your coworkers when they use the chair. It is best to have a lab chair that is as easy to decontaminate as any other piece of laboratory equipment.

When buying laboratory furniture, get furniture / counters that are easily cleaned; laboratory chairs and stools should be covered with non-fabric materials that are impervious to spills and can be easily cleaned. If using radioactive materials remember to use a meter to survey your chair when you survey your work area at the end of a procedure. When you periodically clean your work area, remember to clean your chair as well.

We have been told that Federal granting agencies may make impervious lab chairs a condition of the research grant if it involves certain biological and pathological agents. The easiest solution is to insure all furniture in the lab is impervious. The UW has contracts with several lab furniture suppliers (e.g., Kewaunee Scientific, Fisher/Hamilton, All Seating). When getting new furniture, specify impervious coverings.



Safety Glasses

When working with hazardous material, workers should be wearing adequate protective clothing such as lab coat, gloves, and safety glasses. Sometimes people may think the work they are doing is relatively low risk and the materials they are using are dilute or small volume. Another way to think about these protective equipment is to think of the value of the organ being protected. When I was in Japan, one of my coworkers drove a Harley motorcycle. In the states he belonged to a club like the CC Riders. He bought a used Harley in Japan (it only had 50 miles on the odometer and a small dent on the fuel tank). He shopped around for a good helmet. I asked him what he thought about wearing a helmet. His comment, "You put a \$10 brain in a \$10 helmet."

What value do you place on protecting your eyesight? We have had several incidents over the last several years where people got a drop or so of solvents in their eyes, even though they were wearing safety glasses. Once or twice this happened when they were using a squirt bottle of solvent, a couple of times when using syringes or HPLCs. No damage in any of these cases other than it stung a lot. But, these incidents reinforce the need to have and wear appropriate safety glasses. Lets review uses of eye protection such as goggles, safety glasses and face shields.

Either safety glasses with side shields, or goggles, must be worn at all times by all workers and visitors in the laboratories. Safety glasses must be available for use by visitors. It is the responsibility of the laboratory occupants to ensure that such eye protection is available and used. Such glasses are relatively inexpensive (i.e., \$2 - \$5) and can be obtained through Fischer or any other chemical vendor. While safety glasses with side shields provide some protection against flying particles, they offer only limited protection against splashed liquids. Goggles are the eye protection of choice when working with liquids.

Some situations in which goggles are required are discussed below.

Some laboratories may be so free of hazards as to not require the wearing of safety glasses. This determination must be done by the Principal Investigator, lab supervisor and/or the lab's Chemical Hygiene Officer, and must be documented in writing in the lab's Chemical Hygiene Plan.

What about contact lenses? Wearing contact lenses when working with hazardous materials is inherently risky. Wearers of contacts should be aware that the lenses may increase the risk of eye injury if chemicals become trapped behind the lenses. If you are wearing contacts and chemicals get in your eyes, make sure that the contacts are washed out of your eyes during the washing process. Contact lens wearers must also wear safety glasses or goggles.

There are some types of work that require better eye protection than safety glasses alone. Goggles must be worn when:

1. Working with explosives (diazomethane, acyl azides, picric acid, peroxides, etc.)
2. Working with pressurized reactions (including hydrogenations)
3. Working with materials that can damage your eyes if there is any risk of them getting into your eyes. These materials include:
 - a. Liquid pyrophorics (butyl lithium, ethyl aluminum, etc.)
 - b. Solid pyrophorics (sodium, potassium, sodium hydride, etc.)
 - c. Chemicals that react violently with water (thionyl chloride, chlorosulfonic acid, titanium tetrachloride, etc.)
 - d. Highly reactive or corrosive liquids (NaOH or HCl >0.01 molar, solutions of bromine or iodine, acid chlorides, hydrogen peroxide, etc.)
 - e. Pouring > 1 liter of hot liquids (hotter than 65° C.)
 - f. Transferring > 100 ml of liquid nitrogen or helium.
 - g. Pouring solvents or waste solutions of > 4 liters.



Note that if you work in a fume hood with these materials and keep the sash pulled down with the windows closed so that your eyes are protected by the sash, there may not be a need to wear goggles. You must assess the situation to determine whether there is a chance of these materials entering your eyes. If there is, you must wear goggles.

For the best eye and face protection, wear both goggles and a face shield. Both are available from vendors. Face shields are not considered eye protection, and goggles or safety glasses must be worn also.

Carboys

The Safety Department collects solvent wastes in 5-gallon containers called Carboys.

For many years we had two types of non-radioactive carboys; a square carboy used for



halogenated solvent wastes and a round carboy for non-halogenated wastes. The reason we distinguish the two is



In with the new

We are beginning to replace our old carboys with newer, DOT approved square Nalgene carboys.

Out with the old...

that it is more costly to dispose of wastes that have more than 15 pounds of chlorides per 55-gallon drum. Our goal is to limit the number of drums exceeding this limit by identifying halogens before they go into the drum.

We are still identifying halogenated solvents by using two different colored carboys. Halogenated carboys are yellow or yellow-green in color; plain (non-halogenated) solvent carboys are white (opaque). When requesting carboys, simply request the number of halogenated or non-halogenated carboys.

Winter Waste Warning

Aqueous liquids freeze rapidly at temperatures below 32°F (0°C). We sometimes have days as cold as -20°F (-29°C). To prevent your liquid waste from freezing and breaking the container during transit, fill containers only 3/4 full and place liquid wastes in collection cabinets between 11:30 AM and 12:30 on the pick-up day (Monday and Wednesday).

CORD Holiday Schedule

CORD is closed Thanksgiving day, 28 November. NEN and Amersham will not ship on Thursday; rather P-32 fresh lots and other nuclides will be shipped Wednesday and delivered on Friday, 29 November or Monday, 2 December.

CORD is also closed on Tuesday and Wednesday 24 and 25 December as well as 31 December and 1 January. Phone orders will not be taken from the period Tuesday, 24 December through 1 January. CORD orders can be made via our CORD website (<http://www.fpm.wisc.edu/safety/Radiation/cord.html>). These will be ordered with vendors as always, however, vendors may also be closed during some of this period as well. Backordered items and internet orders that are received from vendors will be delivered during this period. The Annex (room 62 Biochemistry) will be closed beginning (and including) Monday, 23 December through Wednesday, 1 January. Call Safety at 5-5518 for assistance or to set up an appointment.



Training Schedule

Chemical and radiation safety training is available weekly. There are two types of classes. Chem AM classes have chemical safety class beginning at 9:30 AM and the radiation safety class beginning at 12:30 PM. Rad AM classes have radiation safety class beginning at 8 AM and the chemical safety class beginning at 1 PM. The Schedule of these classes from 1 Dec, 2002 through 26 June, 2003 is in the Table:

Chem AM Chemical Safety 9:30 Radiation Safety 12:30	December 5, 9, 19; January 9, 13, 21, 30; February 5, 11, 17; March 6, 18, 24; April 4, 10, 16; May 8, 14, 20; June 4, 10, 17, 26
Rad AM Chemical Safety 8:00 Radiation Safety 1:00	January 17, 23; February 28; March 12; April 22; May 27; June 13, 19

All training classes are held in the Union South. No sign-up is needed; a quiz is used to document training. Booklets for either class can be picked up at our Annex, room 62, Biochemistry. A complete listing of classes is found at: <http://www.fpm.wisc.edu/safety>



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