



Lab Safety

Spectrum

December 2004

Volume 4 Issue 4

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

Radioactive Materials License No. 25-1323-01

Help Line 265-5518

CORD Holiday Schedule

Cord will be closed on Friday, 24 and 31 December. These are state holidays. Phone orders will not be taken from the period Thursday, December 23 through Monday, January 3. CORD orders can be made via our CORD website

<http://www.fpm.wisc.edu/safety/Radiation/radreq.html>

These will be ordered with vendors. Remember, vendors will also be closed during some of these dates as well. Material will be delivered to labs when then are received. The Annex, Room 62, Biochemistry, will be closed, during the period December 23 through January 3. Please call Safety at 5-5518 for assistance or to make an appointment.

Laser Safety

The Safety Department recently added a certified Laser Safety Officer to its staff. The addition of this expert will enable us to provide better safety support to groups which use Class 3b and 4 laser systems. These types of lasers are powerful enough to be capable of causing personal injuries or produce fires. Over the next few months, we will be visiting each area with a high energy laser to review with the manager the specifics of their laser, training for the various types of staff exposed to laser light, the availability of eye examinations for laser workers, etc. If you would like to contact our Laser Safety Officer, please call Arnold Jansen at 2-9608.

Hazardous Material Transportation

Recently the Chancellor restated the UW's Hazardous Material Transportation program. This program includes having a Hazardous Material Transportation Coordinator to assist persons receiving and shipping hazardous material and training of persons shipping or receiving hazardous material. If you send out or sign for hazardous material (i.e., red-bordered shipping paper), you must have received a formal training class within the past 3 years. Both Biological Safety and Chemical Safety offer classes to satisfy this requirement. The Chemical Classes are held at Union South on the following dates / times: January 10 (9 AM - 1 PM); February 21 (11 AM - 3 PM); March 24 (9 AM - 1 PM), April 28 (11 AM - 3 PM), May 24 (9 AM - 1 PM) and June 30 (9 AM - 1 PM). You can sign up via the safety Department Web site

<http://www.fpm.wisc.edu/safety/Transportation/transportation.html>. Alternatively, call Biological Safety (3-2037) or Chemical Safety (2-9178) to schedule yourself for a class.



Carcinogens and Particularly Hazardous Substances

At the UW there are about 750 active research labs. Among these, there are about 250 labs which use radioactive material as a part of their research. These labs use geiger counters to monitor their radiation work. When you go into one of these labs, you can hear the geiger counter "clicking" away. Often, the clicking scares people because everyone knows that radiation is a carcinogen. Often, those same people will work with other carcinogens

without a second thought. "After all," many think, "how could this small amount be hazardous?"

It is important to remember that each exposure may carry with it a small amount of risk. How much risk is constantly being debated. At one time, the scientific community worked to develop models of risk. What they determined was that risk is dependent upon a multitude of factors to include: sex, age at exposure, organ exposed, magnitude of exposure, concentration of agent, exposure rate, etc. The results, while accurately predicting the risk to large populations exposed to the agent, proved to be useless in predicting the outcome for individual exposures. When dealing with individual workers, they either develop a cancer or do not develop a cancer. It does not change the individual outcome to report that a specific population does not exhibit a higher than predicted cancer rate.

Safety is concerned with reducing the individual risk of both cancer induction as well as immediate physical injury from hazardous material exposure. This is accomplished by reviewing the substance from two angles:

- ✓ the risk that an exposure poses to workers (i.e., is the substance a physical and / or health hazard) and
- ✓ the amount of material being handled.

We have included in this newsletter several risk assessment forms that can be found in Annex 2-2 of Chapter 2 of our revised Laboratory Safety Guide. A substance is a *physical hazard* if the material or its reactants

Type of Operation	Protection Factor
Storage (stock solutions)	x 100
Very simple wet operations	x 10
Normal operations	x 1
Complex wet operations with risk of spills and simple dry operations	x 0.1
Dry and dusty operations	x 0.01

may physically cause damage or injury to workers or the workplace. Simple examples include corrosives (e.g.,

acids, bases), flammable material, toxic gases, super cold, etc. *Health hazards* are substances which can cause health problems in workers from either an acute or a chronic exposure.

Once a substance has been determined to be "hazardous," then the next step is to evaluate the magnitude of the risk, that is how likely one is to be exposed in the work place. Here, several factors come into play. One such factor when considering internal deposition is the concentration of the hazardous material. A simple table helps to demonstrate the various levels of risk (or protection factors) based upon concentration of the material.

Particularly Hazardous Substances

While it is prudent to do a risk assessment of every hazardous material being used, a few substances carry such a great amount of health hazard that they have been designated as *Particularly Hazardous Substances*. These include select carcinogens, substances with a high degree of acute toxicity (e.g., oral toxicity < 50 mg/kg), and reproductive toxins.



Because of their potential hazard, the Occupational Safety and Health Administration (OSHA)(29 CFR 1910.1450) requires research labs that work with these substances have "provisions for additional employee protection" which include:

- A) Establishment of a designated area
- B) Use of containment devices (e.g., fume hood / glove box)
- C) Procedures for safe removal of contaminated waste
- D) Decontamination procedures

We have been working with the Graduate School to develop a process to facilitate this review and insure a proper review will keep worker exposure to these particularly hazardous substances to an acceptable level. Appendix D of the UW's Laboratory Safety Guide discusses procedures for working with these Particularly Hazardous Substances. The assessment is performed by completing a Particularly Hazardous Substance Use Approval Form. This form is included in the newsletter and is available for download from our web site:

<http://www.fpm.wisc.edu/chemsafety/forms.htm/>.

The approval form needs to be approved before work with the substance can begin [29 CFR 1910.1450 (e)(3)(v)].

The Safety Department has geared up to assist labs in this review. Our staff can provide guidance for any particularly hazardous material use, but our discussion with the Graduate School has suggested the review take one of two paths, depending upon specific work (references are to our Laboratory Safety Guide):

1. For Particularly Hazardous Substances which are known or probably human carcinogens

(as identified by the International Agency for Research on Cancer (IARC) -- see Annex D-1 to Appendix D), for reproductive toxins (see para D.2) and for substances with a high degree of acute toxicity (see Para D.3), and for work which has a protection factor of 1 or less (e.g., normal operations, complex wet operations with risk of spills and simple dry operations, and dry and dusty operations), complete the form and FAX it (2-6767) to the Safety Department for review by one of our chemical safety specialists. In most instances, this review will not take more than one or two days. Depending upon the specific protocol, the specialist may visit your lab to insure the work site is adequate.

2. For Particularly Hazardous Substances which are possible human carcinogens (as identified by the IARC) and for work which has a protection factor of more than 1 (e.g., very simple wet operations, storage), the review can easily be conducted by the lab's / department's Chemical Hygiene Officer.

The review would be completed by the lab completing a Particularly Hazardous Substance Use Approval Form for each such use. This form would only need to be completed one time and then filed with the lab's Chemical Hygiene Plan as long as the procedure involving the particularly hazardous substance does not change.

Additionally, the Safety Department would like to keep a copy of each research lab's Chemical Hygiene Plan. This will provide a back-up for the lab's copy and enable the chemical safety specialist to review the lab's plan when review the Particularly Hazardous Substance Approval form.

**Training:**

Chemical and radiation safety training is available weekly. There are two types of schedules; Chem AM classes have the chemical safety class beginning at 9:30 AM and the radiation safety class beginning at 12:30 PM. Rad AM classes have radiation safety classes beginning at 8:30 AM and the chemical safety class beginning at 1 PM. The schedule of these classes through September is:

Chemical AM Chemical Safety Radiation Safety	Start Time 9:30 AM 12:30 PM	January 20, 26; February 1, 9, 17; March 3, 9, 21; April 7, 13, 25; May 3, 11, 19; June 9, 15, 27
Radiation AM Radiation Safety Chemical Safety	Start Time 8:30 AM 1 PM	January 14; February 25; March 15; April 1, 19; May 27; June 21

All training classes are held in Union South. No sign-up is needed; a quiz documents training. Booklets for either class can be picked up at our Annex, Room 62, Biochemistry (11 AM - 2 PM). A complete listing of classes is found at <http://www.fpm.wisc.edu/safety>

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