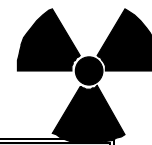


RADIATION REVIEW



UW - Madison Safety Department
30 N. Murray St. 262-8769

Internet:
<http://www.wisc.edu/safety>

Radiation Safety Office
December 1997

NRC License
#48-09843-18

Winter Weather Alert

Winter is cold weather season. Although Safety is trying to relocate our cabinets indoors, many of our pick-up cabinets are still located outside. Aqueous liquids freeze rapidly below freezing and we often experience -20° temperatures. To prevent your liquid waste from freezing and breaking the container, only fill containers $\frac{3}{4}$ full and please do not place liquid wastes in waste cabinets before 11:30 AM on the day of the pick-up (i.e., Monday and Wednesday).



LSC Counting

Biosafe II is an LSC cocktail stocked by the State Consolidated Stores which is sewer disposable. Labs using certified sewer disposable cocktail may simply give Safety cases of vials during the normal pick-up run. There is no charge for processing sewerable LSC vials.

Counting of ^{32}P can be performed using water rather than cocktail. A study conducted by Safety (see April 1996 Newsletter) demonstrated that in 4 ml of water, LSC efficiencies (in glass vials) of approximately 45% were realized. With no cocktail (e.g., filter only), efficiencies of approximately 30% were obtained. This means that ^{32}P can be counted and the waste processed as either solid (if no liquid is used) or sewerable LSC (if only water is used) at a significant saving to your lab.

CORD Holiday Hours

CORD will be closed for the Christmas (Dec. 24 through Jan. 2) holiday season. Telephone orders will not be taken. However, to encourage use of our internet page, we will process orders received via our Web page:

<http://www.wisc.edu/safety>

and deliver the material when received (Note that vendors will also be closed several of these seasonal days).

CORD Contract

The most recent CORD contract can be found at:

<http://www.bussvc.wisc.edu/purch/contract/wp5032.html>

This is not a Safety Page. The contract cost includes shipping. Non-contract items are charged a shipping fee by the vendor in addition to the catalog price.

Spill Reporting

When a spill occurs in the lab: confine the spill, secure the area, notify others in the lab, and devise a plan to decontaminate the spill. These steps will help prevent the spread of contamination from the spill area. If you need assistance, call Radiation Safety at 262-8769. Each lab has an emergency (home) phone listing for after-hours emergencies. Please send Safety a brief report of the event. We maintain a spill file for NRC inspection purposes.

Radioactive Waste

All radioactive material must ultimately be disposed. The actual procedures and requirements depend upon the type of disposal action. This section of the newsletter will discuss several important aspects of radioactive waste disposal at the UW.

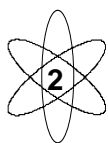
DECAY-IN-STORAGE

Many labs attempt to decay their short-lived waste, particularly ^{32}P . Radiation Safety does not encourage decay-in-storage at the

laboratory level because it: (1) causes inventory problems, (2) increases personnel exposures, (3) increases the risk of loss of material, and (4) increases risk of NRC violations. The University Radiation Safety Regulations (URSR) allow for decay-in-storage for isotopes with half-lives less than 65 days (e.g., ^{32}P , ^{33}P , ^{125}I). Technically speaking, radioactive waste containing longer-lived isotopes cannot be decayed in the labs.

The CORD computer does not decay any isotopes, rather each lab is responsible to account for all millicuries of radioactivity received. We believe that if CORD decayed isotopes, labs would have greater inventory discrepancies. In addition, if a lab purchased 1 mCi of ^{32}P every week, on the day of the receipt the lab would never have more than 3.5 mCi of ^{32}P , not 50 or 60 mCi that some labs are carrying on their inventory. A general rule of thumb that we use is to limit a lab's total possession of an isotope to 3-times the lab's order limit. The lab should make disposals approximately every 3 receipts.

Most of the radioactive materials used in research (i.e., 75-80%) are beta emitters. Labs use GM survey meters to monitor these nuclides and the efficiencies vary from approximately 2 - 5% for $^{14}\text{C}/^{35}\text{S}$ to nearly 50% for ^{32}P . Many labs express concern about radiation exposures from carrying boxes containing ^{32}P wastes to designated



waste pick-up areas. What must be remembered is that beta particles are not as penetrating as gamma rays. While the ^{32}P may expose the worker for the short period of time the waste is transported, *by carrying the waste on a cart, distance should reduce the exposure by at least a factor of 10.* But, more important is the exposure of lab personnel from waste kept within the lab for decay. Absorbing beta particles can produce (bremsstrahlung) x-rays. Approximately 1 in 200 beta particles will produce an x-ray (e.g., 1 mCi produces approximately 10,000,000 x-rays). Although high-energy beta particles may travel up to 15 feet, the x-rays produced are very penetrating and the radiation cannot be detected by GM meters. Even low energy beta particles from $^{14}\text{C}/^{35}\text{S}$ produce some low energy x-rays and vials containing as little as 0.5 mCi can be detected with an appropriate detector. Thus, more frequent disposal removes the source of radiation exposure.

Material in decay mode is often put in an out-of-the-way location; infrequently visited by lab personnel. This may increase the risk of the material being mistakenly thrown out or lost. The loss of radioactive material is a license violation.

The NRC specifies record-keeping procedures for decay-in-storage. Records similar to sink logs must be kept with such information as: date waste boxed, activity in box, date of measurement verifying decay (elapsed time must be greater than 10 half-lives), make/model/SN of meter, background count rate, count rate at surface (must be less than 100 cpm).

All radioactive (yellow/red) labels must be defaced and the waste disposed to normal trash. Lastly, decays (and sink disposals) must be reported to CORD at least quarterly.

If there were sufficient interest, we could provide an internet reporting page for decay, sewerage, etc.; However, labs must be aware that such a page would not result in the lab having a copy of the transaction.

Considering all this and the fact that there is no charge for any waste disposal, we encourage labs to make frequent use of our services to dispose solids and liquids.

SEWERING

Non-hazardous radioactive liquids may be disposed via the sanitary sewer. We do not consider the second rinse to be radioactive and it may be disposed to the sewer without regard to radioactivity.

If you sewer, the following applies: (1) use a designated and approved sink, (2) maintain a sink log, (3) report activities to CORD at least quarterly, (4) no more than 2 mCi total annually (the UW has a 1000 mCi annual limit), (5) sink must be included in monthly surveys.

In most instances (exceptions are noted below), we would prefer you collect liquids and first rinses in small or large volume containers. Safety will provide 1, 2, and 4 liter, small volume and 5 gallon, large volume containers for such disposals. Exceptions to collecting liquids include: (1) If you are using minute



amounts of uranium for electron microscopy, wash it down the drain with an excess of water after each use.

(2) Solutions of < 20% methanol and a few other solutions generated by HPLC work may go directly to the sewer providing you remain within the limits described in Table 9 (Section XIX. C.) of the URSR. Call Safety for guidance.

Annex

Biochemistry has graciously provided a room (Rm 19) for the Radiation Safety Annex. This room is more centrally located than the Safety Department and you may conduct business there when it is open, 11 AM - 3 PM daily. Items available include yellow bags, forms, loaner meters, training manuals, emergency assistance, etc.

Training

Radiation Safety training is conducted weekly at Union South.

Additionally, two classes each semester are held in the morning. Refer to "Today in the Union" for the assigned training room. Except for the two morning dates when training begins at 8 AM, all training begins at 12:30 PM and lasts approximately 4 hours. Training dates for January, February, March and April are:

Morning Classes: Tuesday, January 27 and Tuesday, February 3.

Afternoon Classes: January 5 (Mon), 13 (Tue), 21 (Wed), and 29 (Thurs)
February 6 (Fri), 12 (Thurs), 18 (Wed), and 24 (Tue), March 2 (Mon), 10 (Tue), 18 (Wed), and 26 (Thurs)
April 3 (Fri), 9 (Thurs), 15 (Wed), 21 (Tue), and 27 (Mon)

**NEED OUR NRC LICENSE NUMBER FOR YOUR GRANT APPLICATION? IT'S:
48-09843-18**

UW-Safety Dept.
30 N. Murray St. 53715-2609

(608)262-8769

