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Department of Occupational and Environmental Safety NEWSLETTER

March-April 1998 CASE WESTERN RESERVE UNIVERSITY VOL. 7 NO.2

New Air Monitoring Programs to be Instituted

Safety Services recently sent out "Chemical Use Questionnaire" forms to ascertain the frequency of formaldehyde, benzene, and methylene chloride usage on campus. While formaldehyde use on campus has been monitored for several years, we are now instituting air-monitoring programs for use with these other chemicals as well for the first time.

Currently, the only single-chemical program in place concerns formaldehyde use, which has been covered as part of the OSHA Laboratory Standard since that agency released its new standards on formaldehyde in 1992. We have recently chosen to expand the scope of our monitoring programs to include benzene and methylene chloride as well for two reasons: these chemicals are also regulated under OSHA, and our records show a high usage of these on campus.

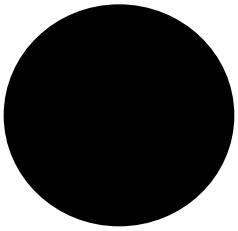
The procedures for assessing the use of benzene and methylene chloride will follow that of formaldehyde. The questionnaire asks how often you use these chemicals, under what conditions, whether there is any odor when using the chemicals, and whether they are used under a fume hood. The questionnaires will help us qualitatively evaluate the risk of employees' exposures to these chemicals. After we receive the questionnaires, we will calculate and assign risk scores to different areas based on the frequency of exposure, toxicity, vapor pressure, and warning properties of these chemicals. Those areas most likely to be at risk of over-exposure will be monitored first.

(continued on p.4)

Storing Flammables in Refrigerators:

Is There a Bomb in Your Lab?

Bombs capable of inflicting serious injuries and significant property damage are present in many hospitals, research facilities, laboratory classrooms and industrial settings. These bombs are not the variety used by terrorist groups, but are the potential explosives produced by educators, scientists, and other professionals when they improperly store flammable liquids and gases in domestic refrigerator and freezers.



Storing chemicals like acetone, acrylonitrile, benzene, toluene, methanol, carbon disulfide, and ethyl ether in domestic refrigerators and freezers presents a potentially dangerous situation. Evapora-

What WASTE!

Recycling of Styrofoam Containers Is Not Acceptable

In the past, we have encouraged researchers to recycle the pre-labeled styrofoam containers in which samples are sent. However, due to uncertainty concerning potential contamination, we ask that you no longer recycle these but treat them as red-bag biohazardous waste.

This is basically a case of "better safe than sorry." These containers are re-used by the companies—in other words, the box that you get has most likely been used before. Although your shipment may have arrived in good shape, we cannot be sure that contamination from previous shipments is not present in these containers, and as the "last user" CWRU is held responsible for any residual contamination that may be discovered *en route* to recycling. For liability reasons, the university has opted to destroy these containers rather than taking the chance of sending out a contaminated box.

There are some important points to keep in mind, however. First of all, note that this policy does not refer to all styrofoam on campus, just the pre-labeled styrofoam containers in which samples are sent.

Furthermore, this policy refers only to styrofoam containers that are returned for recycling to Shipping and Receiving or to the main mail room. Other uses of these containers are possible; for example, it is acceptable to use them to mail out samples to other universities. This qualifies as "re-use," not recycling, and though the distinction may be small, it is important for regulatory and culpability reasons. In this case, investigators must understand that they assume liability for personal ship-

(continued on p.6)

Methylene Chloride in Consumer Products

Methylene chloride is used widely in labs and is present in many common consumer products. Whether at home or in the laboratory, products containing methylene chloride should always be used under very high ventilation conditions because of its hazardous properties.

Methylene chloride causes neurological impairment. Observed effects include fatigue, dizziness, forgetfulness, and delusions. It is metabolized to carbon monoxide in the body which binds to hemoglobin.

In addition, methylene chloride causes cancer in some laboratory animals and may pose a cancer hazard to humans. Harmful exposure to a chemical with the potential to cause cancer, such as methylene chloride, may occur without immediately observable symptoms (such as headaches, dizziness, or watery eyes).

OSHA's regulations concerning methylene chloride have become increasingly stringent over the past few years—the Permissible Exposure Limit (PEL), for example, has decreased several

(continued on p.4)

Upcoming Training Sessions

Radiation (x2906)

•**New Training:** Apr 30(1-4); May 7(9-12), 13(1-4), 26(9-12)

•**Retraining**: Apr 28(2-3); May 6(2-3), 18(10-11), 29(2-3)

•**X-ray Training:** call office to set up training session

Bloodborne Pathogen (x2907

Storing Flammables in Refrigerators:

Is There a Bomb in Your Lab?

(continued from p.1)

tion of these chemicals can cause flammable vapors to build up and eventually reach an explosive mixture concentration. Storing these chemicals in closed refrigerated areas in glass or metal containers with open tops, loose-fitting caps or cotton stoppers creates a time bomb of sorts.

Here's why: every time the door of the domestic refrigerator is opened or closed and the light goes off and on, the compressor is thermostatically triggered to start or stop by an internal temperature control switch, or the self-defrosting mechanism automatically comes on, an electrical arc is produced. When a flammable vapor-air mixture is present in the storage compartment of the freezer or refrigerator, any of these arcs can set off an explosion. The severity of such an explosion depends on the flash point of the material, its lower flammability or explosion limit (LFL or LEL), its rate of evaporation, volume of the enclosed space, and concentration of the flammable vapors.

Not only can these "bombs" threaten life and destroy property, they can also destroy valuable analytical research work that may take months to duplicate.

To prevent this dangerous situation, these chemicals and gases must be stored in approved explosion-safe refrigerators and freezers ONLY, which are designed for the storage of flammable materials. In these appliances, potential ignition sources—lights, door switch, thermostat, and exposed electrical components and circuitry—are removed from the interior chambers, and any external electrical components are located at the top of the refrigerator to further minimize ignition from vapors that are heavier than air. Laboratory-safe units connect to power sources in the same manner as standard household refrigerators.

Noncombustible or nonflammable materials can be stored in domestic refrigerators, but combustible or flammable materials cannot; nor is a modified version of a domestic appliance acceptable—the modifications are difficult to make successfully, and even tightly capped containers with volatile materials can leak, albeit slowly.

Be sure that you lab is made bomb-proof by using only the proper storage equipment. Call Safety Services at x2907 with any questions.

HOT TIPS

Radioactive Waste Segregation

It is vital for the safe disposal of radioactive waste that it be properly segregated and labeled. Below is a listing of each type of radioactive waste and how it must be disposed of.

1) Dry solids

Dry solid waste consists of disposable labware, gloves, bench paper, and SHARPS. Dry waste classified as SHARPS includes needles, scalpel blades, pipets, and pipet tips.

- Separate dry waste by isotope.
- Any needles or scalpel blades must be disposed of in a red SHARPS container; any other "SHARPS" such as pipet and pipets tips can be placed in a securely sealed cardboard box. If the waste is biohazardous, it should be autoclaved and the biohazard symbol defaced prior to being picked up for disposal.
- Radioactive waste that contains regulated chemicals, such as acrylamide gels, must be separated from non-regulated waste.
- Scintillation vials and betaplate mats must also be kept out of dry waste (see below).
- Place dry radioactive waste (other than SHARPS) in the large dry solid bags, being careful not to overfill them. If you use biohaz-

(continued on p.5)

Methylene Chloride in Consumer Products

(continued from p.2)

times and is now 25 ppm / 8 hour average. This reduction reflects methylene chloride's potential danger and the detrimental health effects which have been observed in exposed individuals. It also shows the increased awareness and concern of regulatory agencies as to the chemical's hazardous propertio tsuÊÊÊ

(continued from p.1)

HOT TIPS: Radioactive Waste Segregation

(continued from p.3)

ard bags for waste that is not biohazardous, the biohazard symbol must be defaced prior to being picked up.

2) Scintillation vials

• Scintillation fluid and any object that once held scintillation fluid must be disposed of separately from dry waste. Put all vials in the bags specifically designed for that purpose—the bags we give out for dry solid waste are inappropriate for disposing vials. Do not use the small desktop bags which look similar to the vial bags as they are very thin and almost universally leak. Vial bags are available by request.

• Scintillation fluid does not need to be separated from the vial itself before disposal; the entire vial (cocktail included) can simply be thrown away.

• Do not mix scintillation vials in with solid waste, even if they are empty.

3) Liquid waste

• Liquid waste should be separated by isotope, and every container of liquid waste must be accompanied by a separate completed Disposal Listing for Liquid Radioactive Materials form.

• Be sure to list all the chemical constituents of the waste—after it is no longer considered radioactive, it may still require special disposal procedures if it contains a regulated substance. "Aqueous waste" is NOT a sufficient description. (If the waste is 100% water, say so.) If possible, the waste should be separated by chemical class (regulated, non-regulated) to facilitate disposal.

• No solids should be present.

• Radioactive aqueous-based liquids ready for disposal should have a pH between 6 and 8.

• Put liquid waste in containers no larger than 4L. It is too difficult to carry and pour if the container is larger than 4L; larger sizes will be accepted only for decay in storage and will not be returned to the researcher until waste has decayed. Labs with large volumes of liquid waste may request 5 gallon containers at no cost.

• All radioactive liquid waste must be double-contained. This serves as a precaution against leakage. The outer container must be waterproof and able to hold all the liquid should a breach of the inner container occur. A Lucite shielding container or even a five-gallon bucket is suitable for this job.

• Use recyclable containers whenever possible rather than single-use containers such as milk jugs or tissue culture flasks, which must be disposed of as solid waste. Each lab should have two such containers; when one is ready for disposal, the other can be used. We will return the first as quickly as possible.

4) Animals or animal waste

• Place all animal remains and waste in the freezer in Room EB10A of the Animal Resource