

Waste Disposal

The disposal of waste chemicals is potentially one of the most hazardous and costly operations in a chemical laboratory. Recent years have seen a catastrophic escalation in the regulations governing waste chemical disposal and the associated costs. No longer is it possible to merely "dump into the sink" all water-soluble materials (and many water-insolubles as well).

In 1980 the federal government (EPA) introduced new regulations regarding the disposal of chemicals. This "cradle to grave" concept requires that chemicals be followed from the initial production and use of the chemical to final disposal. States have the option of adopting the federal rules or adding modifications that are more restrictive than the federal rules. The initial laws were written and interpreted for the large "generators" of waste chemicals and the interpretation for small generators (few pounds of solids or several gallons of liquids) must still follow. Thus, at this point, there is no clear direction or instruction as to how all disposal problems are to be solved. This newsletter will continue to look at this problem and provide comment in subsequent issues.

One guide to waste disposal procedures for both inorganic and organic chemicals is the current Aldrich Chemical Catalog which is available free of charge. Each entry in the catalog has a disposal designation that is described in the appendix. Although many variations and combinations are possible, four principle methods of waste disposal are dominate in the waste disposal descriptions:

1. Wash down drain - small quantities of water-soluble chemicals which do not hydrolyze to form volatile, toxic or odoriferous materials may be flushed down the drain with copious amounts of water.
2. Treat - then wash down drain - Examples: acids and bases should be neutralized (pH between 4 and 10) before flushing down the drain with copious amounts of water. Some oxidizing agents and reducing agents can be rendered harmless by reaction before flushing down the drain.
3. Incineration - flammable liquids not miscible with water must not be poured down the drain. Incineration is the approved method of disposal. The problem is that colleges typically do not operate incinerators and there are very limited numbers of "approved" incinerators.

One option is to collect liquids in special waste solvent containers and then pay commercial vendors to pick up this waste and dispose of it. Remember - halogenated solvents must be treated separately from other liquids.

tails, preparation of standards, and sample calculations.
This is an excellent resource for experiments.

Audio-Visual

There are several movies available that describe "do's and don'ts" in the area of chemical health and safety. There are few, however, which are concerned with the philosophy associated with safety and a realistic description of the many human forces that play a role in the work environment. The film "Nobody's Perfect" is the story of a super scientist (molecular biologist) working in a research laboratory. His concern for safety is minimal and consequently there are a series of accidents including explosions, injuries, and evacuations. This film is new and refreshing and can stimulate discussion of concerns and attitudes.

"Nobody's Perfect"
National Audio Visual Center
General Services Administration
Washington, D.C. 20409
Phone 301-763-1896
Cat. No. A03(63-M600)
Purchase - \$164.00 Rental \$25.00

HELP

The ACS maintains a "hot" line regarding safety and chemical operations. If you have a question of toxicity of a chemical or a disposal question, you can try the following number

202-872-4511

and talk to Barbara Gallagher.

American Chemical Society Safety Committee

About two years ago, the Division of Chemical Health and Safety received official status from the governing body of the American Chemical Society. The Division has a complete program including symposia at all national meetings and division membership (\$5.00) is available.

The American Chemical Society has a Safety Committee that meets to discuss problems and to make recommendations. A number of items were discussed at the ACS meeting in New York last August.

1. A subcommittee provided a review of the text "Prudent Practices for Handling Hazardous Chemicals in Laboratories". It was recognized that this text was a good start, but unfortunately there are presently no plans to provide a second edition. It is a "best seller" in that the first printing has been sold out (\$12.50). The book provides general guidelines but does not provide specific details of how to solve many present safety problems in academic laboratories.

Another option may involve an understanding of state rules and regulations. For example, the State of Wisconsin Regulation 154 indicates that individual facilities are permitted to evaporate 1.5 gallons of organic material per day. Thus, a safe and controlled evaporation scheme may be a partial disposal answer. Other ideas will be considered in future issues of the newsletter.

4. Bury in landfill - burial in a landfill must frequently be done by commercial vendors because of the special licenses required. Additional options and comments will be provided in the next issue.

References

1. CHRIS Hazardous Chemical Data

Superintendent of Documents
U.S. Printing Office
Washington, D.C. 20402

Complete set (2 parts) \$21.00 Stock No. 050-012-00147-2
(Most large cities have GPO bookstores and it is easy to order items printed by the government by phone)

One page is devoted to each compound and information is provided under 13 sub-headings. The titles include health hazards, chemical reactivity, label, hazard classification, physical constants and emergency information.

2. Prudent Practices for Handling Hazardous Chemicals in Laboratories

National Academy Press
Washington, D.C. \$12.50

also available from

Lab Safety Supply Company
P.O. Box 1368
Janesville, WI 53547

3. An excellent description of analytical methods is given in the following reference again available from the Superintendent of Documents.

NIOSH Manual of Analytical Methods

Vol. 1	\$12.50
2	10.00
3	13.00
4	7.25
5	9.00
6	8.00

If, for example, you have an interest in determining formaldehyde concentration in a biology laboratory, this reference will provide three different methods including excellent de-

2. There is continued discussion regarding the recommendation to require colleges and universities that are on the ACS approved list to include a course on chemical health and safety in the curriculum. This discussion is continuing with the Committee on Professional Training.
3. Some schools send lists of chemicals to many vendors for bids and give the order to the firm that provides the lowest quote. One question currently being asked is whether the quality of some chemical suppliers is so poor that in fact a dangerous situation is created when these chemicals are used and stored in high schools and colleges. Samples of chemicals are presently being secured and being tested to answer this question.

MACTLAC Safety Committee

The MACTLAC Safety Committee was formed during this past year in response to the increased concern regarding chemical health and safety in the science laboratory. Its principal purpose is to gather and share information, concerns, and partial answers to questions being asked by chemistry teachers in small colleges. People interested in working in this area have been identified and the committee membership is listed below. This committee is anxious to receive ideas, comments and information from all interested people and, in turn, organize and share this information with other MACTLAC schools. Committee membership is located in several different states to facilitate communication. Reports in the form of a newsletter will be sent to the designated safety officer at each MACTLAC school. We need your help.

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