

## III. Chemical Waste

### 1 Introduction

This section covers aspects of managing excess chemicals in your laboratory. Chemicals should not be poured down the drain or placed in regular trash. Chemical wastes must be properly collected and labeled for proper disposal.

### 2 Chemical Waste

Certain chemicals have characteristics that make the material a potential risk to human health and the environment. The Resource Conservation and Recovery Act (RCRA) is a federal law designed to safely manage chemical waste.

A hazardous waste is defined as a waste which because of its concentration or its physical, chemical or infectious characteristics may pose a substantial risk to human health, safety, welfare or to the environment when improperly treated, stored or managed. A Listed RCRA Hazardous Waste, as defined by the EPA, is a

- Discarded commercial product (e.g. an expired bottle of ether)
- Process waste (e.g. waste generated by liquid chromatography HPLC) or waste mixture

RCRA also defines Characteristic Hazardous Waste as meeting any of the following:

- Corrosive liquids (pH < 2 or pH > 12.5)
- Ignitable (Flash Point < 140° F)
- Toxic
- Reactive
  - A cyanide or sulfide bearing waste that when exposed to liquids between pH 2.0 and pH 12.5 gives off toxic vapors
  - Capable of detonation when subjected to heat
  - Unstable or reacts violently with water or air
  - Generates toxic gases or vapors when mixed with water

### 3 Chemical Waste Disposal Guide

Waste disposal guidelines developed by the University of Pittsburgh provide procedures necessary to comply with the regulations governing hazardous materials. These guidelines are presented in the Chemical Hygiene Plan, located on the EH&S website at the following link, (<http://www.ehs.pitt.edu/assets/docs/chem-hygiene-plan.pdf>) and include:

- Requirements for disposing of chemical waste
- Labeling and packaging procedures
- Instructions on how to schedule a hazardous waste pick up through EH&S

## 4 Other Chemical Waste

There are chemical wastes that do not meet the definition of hazardous waste in RCRA, but are still required to be captured for proper disposal due to hazards inherent in the material. The most common examples of this type of waste are ethidium bromide gels and used acrylamide gels. Due to their mutagenic properties, these materials:

- Can not be poured down the drain or placed in the regular trash
- Can not be stored in biohazard waste bags
- Must be disposed of through EH&S chemical waste program

Information on specific chemical waste disposal is available at the following links,

Hazardous Waste Disposal Procedures,  
<http://www.ehs.pitt.edu/assets/docs/HazardousWaste.pdf>,  
Chemical Waste Disposal Quick Reference Guidelines,  
<http://www.ehs.pitt.edu/assets/docs/chem-waste-disposal.pdf>,  
Guidelines for Flammable Liquid Disposal,  
<http://www.ehs.pitt.edu/assets/docs/flam-liquid-disposal.pdf>,  
Guidelines for Ethidium Bromide Disposal,  
<http://www.ehs.pitt.edu/assets/docs/ETHIDIUM-BROMIDE-DISPOSAL.pdf>,  
and Polyacrylamide Gel Disposal  
<http://www.ehs.pitt.edu/assets/docs/PolyacrylamideGelDisposal.pdf>.

## 5 Non-Hazardous Waste

Waste materials are not considered hazardous waste if the material does not pose a substantial risk to human health. These materials can be disposed of in the regular trash or can be safely poured down the drain. These materials include:

- Uncontaminated filter paper
- Uncontaminated PPE
- Non-contaminated biological grade materials used in labs, such as amino acids, sugars and starches, nutrient solutions and vitamins
- Paper towels for hand drying

Call EH&S if you have any questions regarding disposal of chemical waste at 412 624-9505.

## 6 Managing Chemical Waste at Pitt

All faculty and staff working with chemicals or packaging chemicals for pick up are required to complete the Chemical Hygiene Training in person or on-line within the first 30 days of being assigned to a lab position. Refresher training is required every three years.

Procedures for labeling and packaging chemical waste:

- Use durable containers that are compatible with the chemicals.
- All chemical containers must be labeled and capped when not in use; Waste containers must be closed at all times.
- Place a University "Chemical Waste Label" (orange) on all chemical waste containers. Call EH&S for labels (412-624-9505).

## Chemical Hygiene Training

- All chemical waste labels must contain the common chemical name of all constituents, department, your name, phone number, and date of first use.
- Store chemical waste in a secure location.
- It is recommended that all excess chemicals be removed from the laboratory within 30 days.

Excess chemicals are picked up by EH&S or designee on a bi-weekly schedule at multiple collection points. The schedule can be found at <http://www.ehs.pitt.edu/workplace/waste.html>.

All containers of excess chemicals should be placed in a box that has cushioning material and be delivered to the collection point for your building.

## 7 Packaging Requirements

Guidelines for Handling Chemical Waste:

- Use original product containers for waste chemicals when possible, or use similar compatible containers with lids.
- Do not mix incompatible chemicals. For example, do not mix strong inorganic acids or oxidizers with organic compounds.
- Segregate chemical wastes according to incompatibilities throughout disposal process.
- Do not dispose of waste chemicals into lab drains.
- Avoid collecting flammable liquid waste in containers over one gallon in size, unless you can store waste containers in a flammable material storage cabinet.
- Fill chemical waste containers to no more than 90% of container volume.
- Leave at least 2 inches of space in waste bottles to allow for liquid expansion.
- Make sure caps are tightly secured at all times. It is NOT acceptable to leave a funnel in a waste collection container.
- Keep acids, bases or aqueous solutions containing heavy metals separate from other wastes.

For examples of waste container labeling, additional packaging procedures and other chemical incompatibilities, contact EH&S at <http://www.ehs.pitt.edu/workplace/waste.html>.

## 8 Waste Minimization

The University of Pittsburgh is committed to reducing the amount of chemical waste generated. Each waste generator should consider the following when planning an experiment:

- Minimize the volume of chemicals used.
- Purchase only amounts of chemicals necessary for the short-term.
- Use older chemicals first.
- Check existing inventory prior to ordering additional chemicals.
- Substitute less hazardous chemicals when possible.
- Reduce unknowns by labeling all containers.
- Avoid ordering non-returnable non-refillable compressed gas cylinders.
- Replace mercury filled thermometers with non-mercury-containing varieties.
- Consider using the EH&S chemical redistribution program; information is available at the following link, <http://www.ehs.pitt.edu/workplace/waste.html>.

EH&S is available to assist you in waste minimization strategies or large clean-outs of excess chemicals.