

# **SCHOOL SCIENCE LABORATORY CHEMICAL DISPOSAL - GENERAL PRACTICE GUIDELINES**

**NOTE: Local and State regulations may provide more specific or different requirements from these Guidelines. The user of guidelines must be familiar and comply with these requirements. These guidelines also assume that the School District will have an Environmental Services or similar office or individual that can provide more detailed and specific guidance as appropriate.**

The waste generated at a high school laboratory can be first categorized as either hazardous or non-hazardous. Most non-hazardous material can be disposed in the normal trash. Hazardous materials can only be disposed at approved disposal facilities and require proper labeling and handling procedures.

It is important to keep in mind that these Guidelines do not rely upon the formal definition of hazardous waste. Here we are more concerned with the safety and health of students, staff and those handling the wastes. As a result, these Guidelines call for more rigorous handling and disposal practices than the hazardous waste regulatory programs.

The hazardous waste can be further classified into the following general categories in almost all cases:

## **PRIMARY DISPOSAL CATEGORIES**

1. Corrosive Waste
  - a. Acid waste streams, pH <5
  - b. Basic waste streams, pH > 10
2. Organic Waste
  - a. Solvents
  - b. Solid organic materials
3. Toxic Aqueous Waste
  - a. Primarily aqueous heavy metals
  - b. Some reactives, i. e., sulfides

A particular waste stream may fall into more than one of the above categories. For instance, an acid solution of heavy metal would be in both the 1.a. and 3 .b. category. Organic wastes are almost invariably toxic. The following disposal scheme will handle these materials in an organized fashion.

## DISPOSAL PRACTICES

**THE PRIMARY RULE IS TO NEVER HANDLE OR ATTEMPT THESE PROCEDURES UNLESS YOU HAVE BEEN TRAINED IN THE PROCEDURES AND HAVE APPROPRIATE PROTECTIVE EQUIPMENT. IF IN DOUBT, DO NOT ATTEMPT THESE PROCEDURES. NEVER ALLOW STUDENTS TO CONDUCT THESE PROCEDURES. STUDENTS MAY OBSERVE; HOWEVER, THEY MUST WEAR APPROPRIATE SAFETY EQUIPMENT INCLUDING EYE PROTECTION, SPLASH SHIELDS AND APRONS, AND THEY ARE AT A SAFE DISTANCE.**

### **Corrosive Waste**

The corrosive wastes can be neutralized to render them non-hazardous. Some carbonate compounds such as sodium or potassium carbonate best neutralizes acids. The use of a carbonate precludes overrunning neutrality to the basic side. Likewise, a mild acid such as boric acid is best used to neutralize basic streams. After the stream is neutralized it should be determined if there are any materials that render it still hazardous, such as heavy metals. If not, the waste can be poured down the drain. Do not pour excess solids down the drain as they may plug the drains. Decant and drain the solids and add them to the regular trash.

### **Organic Waste**

**NO ORGANIC SOLVENTS CAN BE Poured IN THE DRAIN.** Simple used solvents should be combined in a glass container in the storage cabinet. The District will arrange for periodic removal and disposal using a contractor.

**REMEMBER** to fully label all waste materials so there is no confusion as to the constituents added to the container. Periodically these materials will be collected and sent for disposal to a qualified facility. Exotic or reactive solvents should be stored in a separate, individual container for disposal. Questions or disposal requests should be directed to the Environmental Safety Officer at the District.

All organic solids should be considered toxic. These materials should be re-containerized and stored pending disposal. **REMEMBER** to label all waste materials as to the constituents added to the container

### **Toxic Waste**

**RESIDUAL AQUEOUS WASTE STREAMS THAT CONTAIN HEAVY METALS CANNOT BE Poured DOWN THE DRAIN.** These materials should be stored in glass bottles. Used one gallon acid bottles are an ideal choice. **REMEMBER**, a large label should be applied to the bottle so that the condition of the material is not obscured and any type of material added should be noted on tile label.

**DO NOT label as simply: Experiment 6.** Maybe you know what is in Experiment 6, but the person that ends up coming in to dispose of the material does not.

**METALS CANNOT BE DISPOSED DOWN THE WASTEWATER DRAIN.** Examples are: arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, lead, selenium, silver, and zinc. Mercury and mercury salts present unique disposal problems and should not be mixed with any other metals or wastes.

One method to minimize the amount of stored aqueous metal wastes is to form a sulfide precipitate of the heavy metals and decant the aqueous portion. Sodium or iron sulfide can be added in excess to a neutralized metal solution to precipitate all the metals. Be sure to neutralize, as dangerous fumes of hydrogen sulfide gas are formed if either of these materials are added to an acid solution. **Do not attempt this method unless you are familiar with the chemical reactions involved.**

When complete the aqueous portion can be decanted and poured down the drain. The remaining solids must be collected and stored for disposal at a qualified disposal facility. The old ceramic crocks that are available in most of the schools are a good means of storing the solid material prior to disposal.

Support for setting up these procedures and training for those that are unfamiliar can be obtained from Environmental Services. This office will also generate the procedures for a disposal request to have the wastes at your facility picked-up and disposed. If questions arise about proper waste handling, contact \_\_\_\_\_.