

Laboratory Waste Disposal Requirements

Introduction

The purpose of this document is to assist you in proper handling and disposal of hazardous chemical waste. If at any time you are unsure how to deal with wastes, immediately consult your supervisor, Dennis Baden the KSU Mgr Health and Safety (ext 2-1950 or Tom Bialke the Manager of Laboratory Safety (2-4996. Contact Tom Bialke for labels.

1. Proper Labeling of Waste

- a. ALL bottles of chemical waste held in the laboratory must have a Used Chemical Container Label with the names of chemicals added to the bottle or attach a separate sheet with the chemicals added.

Used Chemical Label			
Bldg _____	Room _____	Department _____	
<u>CAUTION</u>			
Contents (Circle)			
Solvents	Chlorinated Solvents	Acids	Bases
FLAMMABLE	REACTIVE	OXIDIZER	CORROSIVE TOXIC
List Chemicals Added:			

- b. Or a generic waste label. Attach a list of chemicals added to the container:

HAZARDOUS WASTE	
ACCUMULATION START DATE _____ CONTENTS _____	
HANDLE WITH CARE! CONTAINS HAZARDOUS OR TOXIC WASTES	

- c. When the container is placed in the appropriate Waste Storage Area designated for your laboratory the Hazardous Waste label must be put over the USED CHEMICAL LABEL name and date it:

HAZARDOUS WASTE START DATE _____

HAZARDOUS WASTE START DATE _____			
Uida _____	Room _____	Department _____	
CAUTION			
Contents (Circle)			
Corrosive	Chlorinated Solvents	Acids	Bases
FLAMMABLE	REACTIVE	OXIDIZER	COMBUSTIBLE
List Chemicals Added:			

2. Proper Segregation of Waste

- Do not mix incompatible chemicals in the same waste container. For example, nitric acid and ethanol can form an explosive mixture
- Here is a table of chemical incompatibilities.

Chemical	Incompatibilities
Acetic acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene glycol, perchloric acid, peroxides, permanganates
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Acetone	Concentrated nitric and sulfuric acid mixtures
Alkali and alkaline earth metals (such as powdered aluminum or magnesium, calcium, lithium, sodium, potassium)	Water, carbon tetrachloride or other chlorinated hydrocarbons, carbon dioxide, halogens
Ammonia (anhydrous)	Mercury (in manometers, for example), chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid (anhydrous)
Ammonium nitrate	Acids, powdered metals, flammable liquids, chlorates, nitrites, sulfur, finely divided organic combustible materials
Aniline	Nitric acid, hydrogen peroxide
Arsenical materials	<u>Any reducing agent</u>
Azides	Acids
Bromine	See chlorine
Calcium oxide	Water

Carbon (activated)	Calcium hypochlorite, all oxidizing agents
Carbon tetrachloride	Sodium
Chlorates	Ammonium salts, acids, powdered metals, sulfur, finely divided organic or combustible materials
Chromic acid and chromium	Acetic acid, naphthalene, camphor, glycerol, alcohol, flammable liquids in general
Chlorine	Ammonia, acetylene, butadiene, butane, methane, propane (or other petroleum gases), hydrogen, sodium carbide, benzene, finely divided metals, turpentine
Chlorine dioxide	Ammonia, methane, phosphine, hydrogen sulfide
Copper	Acetylene, hydrogen peroxide
Cumene hydroperoxide	Acids (organic or inorganic)
Cyanides	Acids
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Fluorine	All other chemicals
Hydrocarbons	(such as butane, propane, benzene) Fluorine, chlorine, bromine, chromic acid, sodium peroxide
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid (anhydrous)	Ammonia (aqueous or anhydrous)
Hydrogen peroxide	Copper, chromium, iron, most metals or their salts, alcohols, acetone, organic materials, aniline, nitromethane, combustible materials
Hydrogen sulfide	Fuming nitric acid, oxidizing gases
Hypochlorites	Acids, activated carbon
Iodine	Acetylene, ammonia (aqueous or anhydrous), hydrogen
Mercury	Acetylene, fulminic acid, ammonia
Nitrates	Sulfuric acid
Nitric acid (concentrated)	Acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide, flammable liquids, flammable gases, copper, brass, any heavy metals
Nitrites	Acids
Nitroparaffins	Inorganic bases, amines
Oxalic acid	Silver, mercury
Oxygen	Oils, grease, hydrogen: flammable liquids, solids or gases
Perchloric acid	Acetic anhydride, bismuth and its alloys, alcohol, paper, wood, grease, oils
Peroxides, organic	Acids (organic or mineral), avoid friction, store cold
Phosphorus (white)	Air, oxygen, alkalis, reducing agents
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chlorate	Sulfuric and other acids

Potassium perchlorate (see also chlorates)	Sulfuric and other acids
Potassium permanganate	Glycerol, ethylene glycol, benzaldehyde, sulfuric acid
Selenides	<u>Reducing agents</u>
Silver	Acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
Sodium	Carbon tetrachloride, carbon dioxide, water
Sodium nitrite	Ammonium nitrate and other ammonium salts
Sodium peroxide	Ethyl or methyl alcohol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
Sulfides	Acids
Sulfuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate (similar compounds of light metals, such as sodium, lithium)
Tellurides	<u>Reducing agents</u>

3. Proper Storage of Waste

- a. Always put waste containers in secondary container such as a tray or drip pan that is chemically incompatible with the waste.
- b. Do not store waste in a fume hood where reactions are being carried out.
- c. Do not use metal cans for waste. Use only glass or polyethylene containers for waste.
- d. Do not store flammable waste containers on a bench or floor.
- e. Do not store waste bottles in or near a sink or floor drain.
- f. Never store containers of the following wastes in the same cabinet or secondary container.
 1. Acids and bases.
 2. Organics and acids.
 3. Cyanide, sulfide or arsenic compounds and acids.
 4. Alkali or alkali earth metals, alkyllithiums etc. and aqueous waste.
 5. Powdered or reactive metals and combustible materials.
 6. Mercury or silver and ammonium containing compounds.
 7. This list is not comprehensive.

4. Always Keep Waste Bottles Capped

- a. Never leave the cap off an organic waste bottle.
- b. Never leave a funnel in the waste bottle.

5. Do not accumulation more than ONE bottle of each kind of waste in your laboratory.

- a. If container of waste is full, take it to the appropriate Waste Storage Room for your laboratory.

6. When taking your waste in the waste storage room. Make sure that:

- a. **ALL** waste containers have a proper "HAZARDOUS WASTE" label with start date.
- b. **ALL** contents are listed.
- c. The bottle or jar has a cap that fits tightly.
- d. There are no old or extraneous labels on the container.
- e. If liquid, there is at least 1" of room at the top of the container.
- f. The outside of the bottle is clean and dry.
- g. Incompatible wastes (ex. acids and organics) are not mixed.
- h. Halogenated wastes are separate from "regular" organic wastes whenever possible (it is much more expensive to get rid of halogenated waste)!
- i. The pH is known and listed on the disposal tag.
- j. Follow Department procedures for notification and delivery of waste containers.
- k. Departments that do not have provisions for Waste Storage are to contact Dennis Baden, 2-1950 to arrange for pick up of waste containers.

7. Print the checklist on the following page and survey your hazardous waste practices.

Self-Auditing Checklist for Laboratories

ALL hazardous waste containers must comply with **ALL** of the following requirements at **ALL TIMES**. If any item on this list is not checked, you are in violation of State and Federal EPA regulations.

1. ☐ Is the container sound? (No cracks, rust or deterioration permitted).
2. ☐ Is the container compatible with the waste? (No metal cans for halogenated solvents).
3. ☐ Are the contents of the container compatible with each other?
4. ☐ Is the container properly labeled before being put in waste storage area, including the words **Hazardous Waste**, **date and list of contents**?
5. ☐ Are the contents of the container clearly listed?
6. ☐ Is container closed with a properly fitting cap? (Do not leave funnels in the mouth!)
7. ☐ Is the waste container located in the lab (not in a hallway or storeroom)?
8. ☐ Is there less than 55 gallons of waste in the laboratory?
9. ☐ Is the waste located away from floor drains or sinks?
10. ☐ If the container is full, it is being taken to the waste storage room for disposal.

WASTE CONTAINERS MUST BE CAPPED AT ALL TIMES