CHEMICALS AND/OR MATERIALS TO BE EXCLUDED FROM SCHOOL LABORATORIES

- All unlabeled bottles which contain substances of unknown composition
- 4-aminobipheyl
- Ammonium chlorate (VII) (perchlorate)
- Asbestos, soft forms, paper, fiber, mats, platinised, centred gauzes, gloves
- Benzene, used as a solvent
- Beryllium compounds
- Biphenyl-4-4’ diamine (Benzedrine)
- Carbon monoxide
- Choleric (VII) acid (perchloric acid)
- Chloroethene (vinyl chloride monomer)
- Dicholorbiphenyl 1-4, 4’-diamines (chlorobenzidines)
- Diethyl sulphate
- 3,3’-dimethoxybi phenyl-4, 4’-diamines
- 3, 3’-dimethylbiphenyl-4, 4’-diamine (o-tolidine)
- Dimethyl sulphate
- 4, 4’-dinitrobiphenyl
- Ethyne cylinder (acetylene)
- Hydrazine
- Hydrofloric acid
- Hydrogen cynaide
- Mercury aklyls
- Naphthalen-l-amine (l-naphthylamine)
- Naphthalen-2-amine (2-naphthylamine)
- 4-nitrobiphenyl
- Nitrocellulose
- Nitrogen, triiodide
- Nitronaphthalenes
- Nitrosamines
- Nitrosophenols, 2- and 3- isomers
- Tellurium compounds
- Thallium and compounds
- Zinc chromate (VI)

CHEMICALS EXCLUDED DUE TO SUSPECTED CARCINOGENS

- Aflatoxins
- Aminobiphenyl
- Arsenic compounds
- Asbestos
- Auramine (manufacture of)
- Benzene
- Benzidine
- Bis (chloromethyl) ether
- Cadmium - using, industries (possibly cadmium oxide)
- Chloramphenicol
- Chloromethyl methyl ether
- Chromium (chromate-producing industries)
- Cyclophosphamide
- Diethylstibestrol
- Hematite mining
- Isopropyl oils
- Melphalan
- Mustard gas
- 2-nathylamine
- Nickel (nickel refining)
- N,N-Bis (2 chloroethyl) -2-Naphthy-lamine
- Oxymetholone
- Phenacetin
- Phenytoin
- Soots, tars and oils
- Vinyl chloride

CHEMICALS TO BE ROTATED OR RESTRICTED

The following is a list of chemicals which should be either rotated on an annual basis (L) or restricted to small quantities in storage (R).

Acetonitrile (methyl cyanide)	R	Calcium phosphide	R
Acetic anydride	R	Carbon tetrachloride	R
Aerosol sprays	R	Hypochlorates	R&L
Alcohol (other than ethanol)	R	Chlorates	R
Aldehydes (other than methanol)	R	Chlorobutanes	R
Alkyl halides	R	Chloroethane	R
Aluminum bromide	R&L	Chloral hydrate	R
Aluminum carbide	R&L	Chloroform	R
Ammonium nitrate	R	chloromethylbenzene	R
Amyl acetate	L	Chloropropanes	R
Anhydrone	L	Chlorosulphonic acid	R
Aromatic amines	R	Chromium VI oxide	R
Barium peroxide	R&L	Cyanates	R
Benzaldehyde	R	N,N’-dialkylphenylamines	R
Benzoyl chloride	R	1,2 dibronopropane	R
m-phenylenediamine	R	Dichlorobenzene	R
p phenylenediamine	R	Dichlorodimethylsilane	R
Benzonitrite	R	Dichloroacetic acid	R
4-isocyanathophenylmethane	R	2,4 dichlorophenyls	R
Bleaching powder	R&L	Dodecanoyl peroxide	R
Bromates	R	Diethylemine	R
Bromine	R	Idoine thichloride	R
1-bromobutane	R	Dimethylamine	R
Bromoethane	R	Dimethylformamide	R
Bromomethane	R	Dinitrobenzene	R
2-bormo-2-methylpropane	R	3,5-dinitrobenzoic acid	R
Bromopropane	R	2,4-’dinitrobromobenzene	R

3-bromoprop-1-ene	R	Dinitrophenyls	R
Butanal	R	2,4 dinitrophenylhydrazine	R
Butanoic acid	R	Dioxane	R
Cadmium	R	Dipentine	R
Cadmium compounds	R	Diphenylamine	R
Calcium	R&L	Esters	R
Calcium carbide	R&L	Ethanol trimer	R
Calcium oxide	R&L	Ethylene diamine	R
ethers	R	Oct-1-ene	R
Diethylether	R&L	Phenylemine	R
Ethylamine	R	Phenylammonium salts	R
Fluorides (solid)	R	Phenylethene	R
Germanium tetrachloride	R	Phenylhydrazine	R
Gallic acid	R	Phosphorus, red	R&L
Heptane	R	Phosphorus, white	R&L
Hexamine	R	Phosphorus (V) oxide	R&L
Hexane	R	Phosphorus pentabromide	R&L
Hydrazine compounds	R	Phosphorus pentachloride	R&L
Metal hydrides	R	Phosphorus tribromide	R&L
Hydriodic acid	R	Phosphorus trichloride	R&L
Hydrobromic acid	R	Phosphorus trichloride oxide	R&L
Iodic acid	R	Potassium amide	R&L
Iodoethane	R	Potassium	R&L
Isocyanates	R	Pyridine	R
Iodine trichloride	R	Quinine	R
Lithium	R	Selenium + Compounds	R
Lithium compounds	R	Silicon tetrachloride	R&L
Mercury	R	Silver nitrate	R
Methanol (formaldehyde)	R	Sodium Amide	L
Methanol	R	Sodium	R
Methyl 2 methylpropenoate	R&L	Sodium amalgam	R

Methyphenols	R	Sodium azide	R
N-methylphenylamine	R	Sodium nitrite	R
Millon’s reagent	R	Sodium peroxide	R&L
Molybdenum	R	Sodium sulfide	R
Naphtha	R	Strontium	R
N-naphthylethane-1	R	Sulfur chlorides	R
Naphthylthiourea	R	Thiourea	R
Nessler’s reagent	R	Tin IV chloride	R&L
Ninhydrin (solid)	R	Titanium IV chloride	R
Nitric acid (fuming)	R	Turpentine	R
Nitrobenzene	R	Uranium compounds	R
Nitrophenols	R	Xylene cyanol solid	R
4-nitrosophenol	R	Zinc powder	R
Octane	R		

SUGGESTED CHEMICAL STORAGE PATTERN

Storage of laboratory chemicals presents an ongoing safety hazard. There are many chemicals that are incompatible with each other. The desired solution is to separate chemicals by family characteristics. Below is a list of compatible families. This arrangement will easily enable you to rearrange your inventory into a safer environment.

INORGANIC Top	ORGANIC Top
INORGANIC #10 Sulfur, Phosphorus, Arsenic Phopphorus Pentoxide	ORGANIC #2 Alcohols, Glycols, Etc.
INORGANIC #2 Halides, Sulfates, Sulfites, Thiosulfates, Phosphates, etc.	ORGANIC #3 Hydrocarbons, Esters, etc.
INORGANIC #3 Amides, Nitrates (not Ammonium Nitrate), Nitrites, etc.	ORGANIC #4 Ethers, Kethones, etc.
INORGANIC #1 Metals & Hydrides (Store away from any water)	ORGANIC #5 Epoxy Compounds, Isocyanates
INORGANIC #4 Hydroxides, Oxides Silicates, etc.	ORGANIC #7 Sulfides, Polysulfides, etc.
INORGANIC #7 Arsenates, Cyanides, etc. (Store above acids)	ORGANIC #8 Phenol, Cresols
INORGANIC #5 Sulfides, Selenides, Phosphides, Carbides, Nitrides, etc.	ORGANIC #6 Peroxides, Azides, etc.
INORGANIC #8 Borates, Chromates, Manganates, Permanganates, etc.	ORGANIC #1 Acides, Anhydrides, Peracids, etc.
INORGANIC #6 Chlorates, Perchlorates, Chlorites, Perchloric Acid, Peroxides, etc.	MISCELLANEOUS
INORGANIC #9 Acides, except Nitric	MISCELLANEOUS

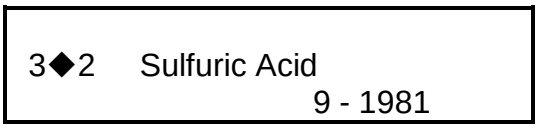
Avoid using the floor for storage of any chemicals.

This list is not complete; however, should you have other unlisted chemicals, plan to take appropriate safeguards.

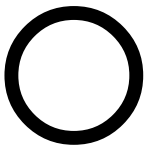
LABELING CHEMICALS

1. Put date chemical is received on label.
2. Put on the National Fire Protection Association code.
3. Put chemical name on label if the name has been obscured.

EXAMPLE:

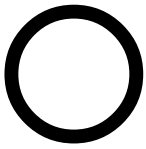


Shelf Pattern Number Sticker:



Organic Chemicals:

Orange sticker on side with shelf pattern storage number on it.



Inorganic Chemicals:

Green sticker on side with self pattern storage number on it.

SUGGESTED DISPOSAL PROCEDURES

Each product listed in the Flinn Catalog/Reference Manual has listed under its name a disposal number. This number refers to one of the suggested disposal techniques listed below. Simply look up the product in the alphabetical section of the product listings and determine the disposal technique number. Then refer to this suggested disposal technique listing for that number and follow the suggested procedure.

No representation, warranty or guarantee is made by Flinn scientific, Inc., as to the accuracy or completeness of their suggestions or information. Local conditions or circumstances unique to your particular situation (applicable federal, state or local laws) should be considered.

We urgently suggest that you recognize the need to carry out these suggested procedures with proper personal safety equipment and in a proper environment. Yes, you should wear gloves, goggles and, in some cases, body protection. Yes, it would be best if these procedures were done in a fume hood. Failing that, certainly adequate ventilation should be provided or the procedure done out of doors. Stay upwind of these outdoor reactions and be certain that your activities are in an isolated area and present no hazard to your neighbors. Make a checklist of the materials you will need before you start a procedure. Flinn would suggest that you never be alone while disposing of hazardous materials and that a telephone or other form of communication be available for immediate use.

For further information, write: Technical Service Department, Flinn Scientific, Inc., P.O. box #231, 910 W. Wilson Street, Batavia, Illinois 60510; or phone (312) 879-6900.

#1a (ACID HALIDES, ORGANIC)
Place a layer of sodium bicarbonate in the bottom of a suitable glass container. Slowly add product to be disposed of to this container. While mixing thoroughly add this mixture to a larger container of water. While continuing to add large quantities of water, dispose of the material down the drain.

#1b (HALIDES - INORGANIC)
Place the material to be disposed of in a large, open dish of glass, porcelain or plastic over a layer of sodium bicarbonate. Mix these two ingredients. Using a wash bottle, spray this mixture with a 6 molar solution of ammonium hydroxide. Smoke will develop and when this has diminished add ice water and stir. Now place this mixture in a much larger container. It may be necessary to neutralize this strongly alkaline solution with 6 molar hydrochloric acid. Use litmus paper to determine pH of mixture and treat with acid if necessary until the mixture is neutral. After you are sure the mixture is neutralized slowly pour the material down the drain with large quantities of water.

#2 (ALDEHYDES)

Be sure there are no sources of sparks or other sources of ignition when dealing with these very flammable materials. Assuming that the quantity of material is relatively small place a generous quantity of vermiculite in a large, open container. Allow the vermiculite to absorb the product. Transport this material to an open and safe area and burn the mixture. Use an excelsior train or some other safe method for ignition.

#3 (ALKALINE EARTH METALS)

This method is intended for small quantities of material. Cover the product to be disposed of with dry soda carbonate. Remember that these alkaline earth metals react vigorously with water. The sodium carbonate must be dry. Mix the sodium carbonate well with the product to be disposed of while adding the mixture to butyl alcohol. Allow the mixture to stand for 24 hours being certain that it is protected from disturbance. After 24 hours dilute the mixture with very large quantities of water and put this mixture down the drain.

#4A (NITROPARAFFINS 7 CHLOROHYDRINS)

Mix the product to b disposed of with sodium carbonate. Place this mixture in a large glass or plastic container. Slowly add a 6 molar solution of hydrochloric acid to neutralize this mixture. Use indicator paper to know that it has been neutralized and now place the mixture down the drain with large quantities of water.

#4b (HALOGENS, ORGANIC)

Add the product to be disposed of to vermiculite. Now add a sodium carbonate-sand mixture (9 parts sand to one part sodium bicarbonate). Mix these ingredients thoroughly and place in a paper bag and then in a cardboard carton. This material should then be burned in an open incinerator or in an open area using an excelsior train to start the fire.

#4c (ORGANIC ACIDS, SUBSTITUTED)

Place the material to be disposed of on a large quantity of sodium bicarbonate. This mixture should be done in a large open vessel of glass or plastic. Once the mixture is complete place it in a very large bucket or drum and add a large quantity of water. Allow this to stand for 24 hours and then place down the drain with a large quantity of water. Remember that you are dealing with materials that ignite so be careful to eliminate any source of spark or ignition.

#5 (AMINES, AROMATIC)

Make a mixture of sodium carbonate and sand, 9 parts of sand to one part sodium carbonate. Now add the product to be disposed of to this mixture and place in a paper bag and then a cardboard carton. This material should be burned in an open incinerator or in an open area. Start the fire with an excelsior train.

#6 (HALOGENATED AMINES, AROMATIC)

Same as #5

#7a (AMINES, ALIPHATIC)

Using a large open glass, porcelain or plastic dish add the material to be disposed of to a layer of sodium bisulfate. Using a wash bottle, spray this mixture with water. Neutralize with 6 molar hydrocloric acid checking the pH with indicator paper to be sure it is neutral. Now wash down the drain with large quantities of water.

#7b (PHOSPHATES, ORGANIC)

This material will have to be incinerated in an open and safe area. First mix the product to be disposed of with about equal parts of sand and calcium carbonate (1 limestone). Wet this mixture down with a flammable solvent (e.g., alcohol) and burn it. Set the fire with an excelsior train and take all precautions since you are dealing with a flammable mixture.

#8 (AZO & AZIDE COMPOUNDS)

The material to be disposed of should be dissolved in a very large quantity of water until you have diluted it to a point where the material being wasted represents only 5% of the mixture. Add a large quantity of a 20% solution of sulfuric acid. Test with litmus so that the solution is just on the acid side. Allow the mixture to stand for several hours. Using starch-iodide indicator paper check to see that slightly acidified solution will turn the paper blue. This indicates that decomposition is complete since nitrite is present. This mixture may now be disposed of down the drain with large quantities of water.

#9 (CARBON DISULFIDE)

You are dealing with a very flammable product here to every precaution should be taken to avoid ignition. Using ground wire would be a smart move in order to avoid a spark or a static charge. This material must be burned in order to dispose of it. Pour the carbon disulfide (preferably out of doors) over vermiculite in a suitable metal container. If you must transport this material some distance to the burn site then cover the carbon disulfide soaked vermiculite with a layer of water. At the burn site pour off the water and, using an excelsior train, ignite and burn the mixture.

#10 (AMMONIA & CAUSTIC ALKALI)

Place in a very large container of water and add water until you are sure the
product has been neutralized. Then dump this mixture in the sewer with large amounts of water.

#11 (INORGANIC SALTS)

Fill a large glass or plastic container with water. Add the product to be disposed of and, in addition, add sodium carbonate (about 1/2 the amount of the volume of product being wasted). If a fluoride is involved also add about that same amount of calcium hydroxide. Let

this mixture stand about 24 hours. This solution should be neutralized with 6 molar hydrochloric acid. Use indicator paper to insure that the mixture is neutral before putting the material down the drain with large quantities of water.

#12a (OXIDIZING AGENTS)

Add the material to be disposed of to a concentrated solution (50%) of sodium thiosulfate (hypo). Add 3 molar sulfuric acid to make the solution acid. Check with indicator paper. Allow several hours to pass for reduction to occur. Now neutralize this mixture with sodium bicarbonate or dilute hydrochloric acid. Dispose of the neutralized material down the drain with large quantities of water.

#12b (REDUCING MATERIALS)

Using a large container put the material to be disposed of with an equal quantity of sodium carbonate and water. A slurry will be formed. Now add calcium hydrochlorite and more water. Allow this mixture to stand for several hours. The product's pH should be determined with indicator paper. If acid, neutralize with 6 molar hydrochloric acid solution. Wash the neutralized material down the drain with large quantities of water.

#13 (SULFIDES, ORGANIC & MERCAPTANS)

In some cases, you are dealing with flammable materials so take all necessary precautions. cover the product to be disposed of with a solution (weak) of sodium hypochlorite. some household bleachers are a 5% solution of sodium hypochlorite and they will be satisfactory. This mixing and stirring should be done in a large and open glass or plastic container. Allow this mixture to stand at least 12 hours. Check the pH with indicator paper and neutralize with 6 molor hydrochloric acid if the mixture is alkaline or with 6 molar ammonium hydroxide solution if acid. Wash the neutralized solution down the drain with large quantities of water.

#14 (CYANIDES)

This treatment should take place in a large glass or plastic container. Place the product being disposed of in the container and make it alkaline by adding a strong solution of sodium hydroxide. A slurry will form. Add to this slurry a large quantity of ferrous sulfate solution. Allow about 2 hours to pass and then wash this mixture down the drain with large quantities of water. Since chlorine is released in this reaction it is wise to do it in a fume hood, out of doors or where adequate ventilation has been provided.

#15 (ETHERS)

Remember that you are dealing with a very hazardous material and all

sources of ignition must be eliminated. Ether that is old and has been opened and exposed to light can contain peroxides. Just opening the container can be dangerous. Special disposal methods may be required for such material. Contact us before proceeding. If you are satisfied that the material can be easily poured from its container then pour it on the ground in an isolated area and allow it to evaporate.

#16 (HYDRAZINES)

Dilute the product to a 5% level or less with water in a large container. Add 7 to 10 times the weight of the material being disposed of with calciuym hypochlorite. Allow to stand for several hours and then wash down the drain with large quantities of water.

#17 (HYDRIDES)

Mix with dry sand and add butyl alcohol. Add a large quantity of water. Allow this mixture to stand for several hours. Pour off the liquid in to the drain with large quantities of water. Allow the sand to air dry and place it in waste container for normal disposal.

#18 (HYDROCARGONS, ALCOHOLS, KETONES, ETC.)

In almost every case you are dealing with flammable material so take the necessary precautionary steps. Absorb the material to be disposed of on vermiculite. Transport to a burning safe and construct an excelsior train and burn the material.

#19 (AMIDES - INORGANIC)

In a large glass or plastic container place a large quantity of cold water. Add and stir in the materials to be disposed of slowly. Allow about an hour to pass and check the pH. If the solution is acidic, add 3 molar hydrochloric acid. If the solution is basic add 6 molor ammonium hydroxide. Wash the neutralized solution down the drain with large quantities of water.

#20 (AMIDES - ORGANIC)

Mix the material with a quantity of vermiculite and then add a flammable solvent like alcohol. Transport to a burning site and using an excelsior train burn the material.

#21 (INTER NON-METALLIC COMPOUNDS)

Secure a quantity of dry sodium carbonate and calcium hydroxide. Mix the two in equal parts. Place a large quantity of this mixture over the material to be wasted. This should be done from behind some form of body protection. A flash fire is possible so be careful. Now spray this mixture with a large quantity of water. It will be necessary that you gather up the remnants and neutralize them with acid or alkali before you dispose of the material down the drain with large quantities of water.

#22a (PEROXIDES, INORGANIC)

In a large glass container cover the material with at least double its volume in a mixture of 90% sand and 10% sodium carbonate. Lumps may form so break these up with a large plastic spoon. Use the same spoon to then add this material slowly to another container of sodium sulfite solution. the sodium sulfite solution should be in a volume of 4-5 liters. Neutralize this final solution with dilute sulfuric acid. Check to see that it's neutralized with indicator paper. Drain the solution into the sewer with large quantities of water. Air dry the sand and dispose of it in a normal manner.

#22b (PEROXIDES, ORGANIC)

This method is intended for only small quantities of materials. Add 10 times the amount of material to be disposed of with a 20% sodium hydroxide solution. allow to stand for 24 hours and then put it down the drain with large quantities of water.

#23 (SULFIDES, INORGANIC)

Make up a 30-50% solution of ferric chloride solution. Add the product to be disposed of to this solution in a large container while continuously stirring. Add a reasonable quantity of sodium carbonate until the solution is neutralized. Check the pH with indicator paper. After you are sure the solution is neutral dispose of the solution down the drain with large quantities of water.

#24a (ACIDS, ORGANIC)

Small quantities can be treated with sodium carbonate which will form a slurry when water is added. This solution should be neutralized so that only a neutral solution is placed down the drain. Be sure to add large quantities of water.

#25 (CARBIDES)

Hopefully the amount involved is small and the technique is only intended for small amounts. Take the material to a safe and open site and slowly add it to a very large container of water. Since a hydrocarbon gas will be generated no source of ignition should be present. Allow the material to stand for at least 24 hours. A precipitate will be formed. Pour off the liquid and dispose of the remaining precipitate in a normal disposal method.

#26 (WASTE FOR LANDFILL)

These materials are properly disposed of at a local landfill and present little or no hazard.

#27a (SCRAP METALS)

These materials can be safely disposed of in a landfill but this separate procedure is listed since the metals may have scrap value on your local market and this should be investigated before disposing of potentially valuable materials.

#27b (MERCURY)

Only the most severely contaminated mercury cannot be recovered. Place all contaminated mercury in a very tightly
closed bottle and contact Flinn Scientific or your other chemical suppliers for possible recovery. For very small quantities of material add zinc metal powder which will form an amalgam that can be disposed of in your normal waste. The nature of mercury and mercury compounds is such at none should be disposed of in the environment.

#27c (PHOSPHORUS)

If the quantity is small simply cover the material with water and take to a safe
open area. The water will evaporate and the dry phosphorus will ignite spontaneously in air and burn up.

#27d, #27f, #27h

Use procedure described under Technique #11.

#27j

the materials involved cannot be burned and are not soluble in water. For small amounts the materials can simply be allowed to evaporate out of doors. For large quantities we suggest you contact your supplier for possible return of the material.

#29

These materials can be burned in your incinerator as would any normal paper, wood or other wastes.

INSTANT WARNING SYSTEM FOR DANGEROUS MATERIALS

The National fire Protection Association (NFPA) has developed a numerical system for the identification of the fire hazards by materials. The numbers given in the three columns have been taken from NFPA 704M-6th edition.

Abbreviated definitions are as follows:

HEALTH (BLUE)

4 Can cause death or major injury despite medical treatment.
3 Can cause serious injury despite medical treatment.
2 Can cause injury. Requires prompt treatment.
1 Can cause irritation if not treated.
0 No hazard.

FLAMMABILITY (RED)

4 Very flammable gasses or very volatile flammable liquids.
3 Can be ignited at all normal temperatures.
2 Ignites if moderately heated.
1 Ignites after considerable preheating.
0 Will not burn.

REACTIVITY (STABILITY) (YELLOW)

4 Readily detonates or explodes.
3 Can detonate or explode but requires strong initiating force or heating under confinement.
2 Normally unstable but will not detonate.
1 Normally stable. Unstable at high temperature and pressure. Reacts with water.
0 Normally stable. Not reactive with water.

Please refer to the Policies & Procedures Manual for additional information.

Implemented: May 5, 1986 North Thurston School District

See Policies and Procedures manual for additional information.