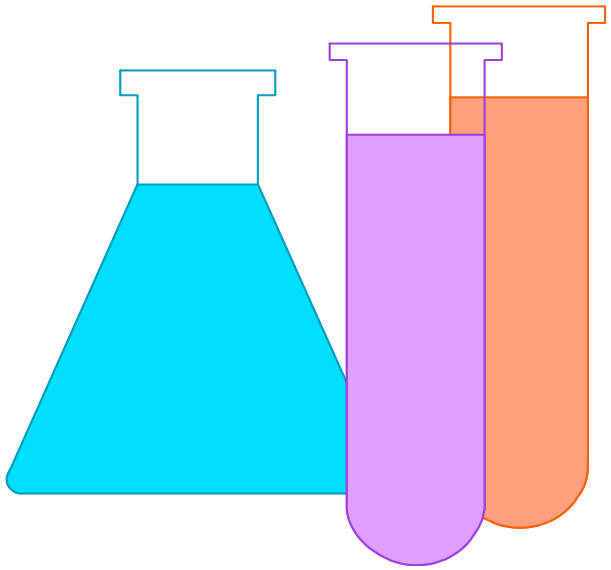
WASHINGTON STATE DEPARTMENT OF ECOLOGY

Step-by-Step Guide to Better Laboratory Management Practices



Prepared by
The Washington State Department of Ecology
Hazardous Waste and Toxics Reduction Program

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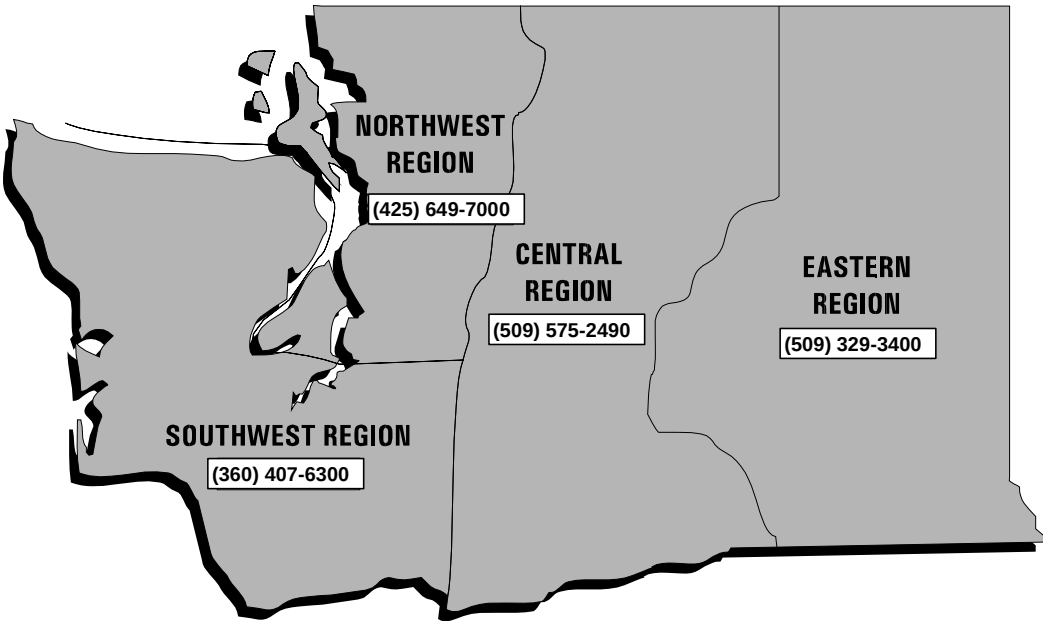

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Introduction

This guide is a product of Washington State Department of Ecology and King County Hazardous Wastes Management Program's cooperative "School Sweeps" project. The goal of the project is to improve hazardous waste management practices and regulatory compliance through technical assistance, and to help assist implementation of pollution prevention at Washington State Community Colleges. The guide describes laboratory best management practices and cites the regulations to help you understand the regulatory requirements.

This guide will present the steps to better management practices in your laboratory. Laboratories regularly generate hazardous wastes. If improperly managed, hazardous waste can pose threats to your safety, damage the environment and risk your health. Proper storage of chemicals can prevent the most serious consequences of catastrophic events or accidents. Your laboratory is most likely already doing some but not all of the best management practices suggested in this guide.

The following topics will be covered in this guide:

- How to separate incompatible chemicals in chemical storage.
- How to manage chemical inventory (detailed information about chemicals, storage codes, hazards, and disposal prioritization codes).
- Hazardous waste characterization and management.
- Laboratory waste minimization.
- Laboratory health and safety.

This guide provides a disk with a computerized inventory of chemicals. The disk is in Word for Windows 6.0[1]. You can perform simple calculations (+, -, ÷, x, =) in Word tables. You can convert this into a spreadsheet for more complicated calculations. This inventory system is not all-inclusive, nor does it address all the hazards associated with handling chemicals. Information on hazards associated with chemicals which have not been addressed in this guide can be obtained from the following sources: the manufacturer, the supplier, the American Chemical Society, qualified consultants, or appropriate government agency. In Washington State, you may contact the Department of Ecology's Hazardous Waste and Toxics Reduction Program, Laboratory Technical Assistance staff, Camille Martin (509) 329-3551.

[1] If you need another version or program, please contact the laboratory assistance staff listed above.

Section 1
Laboratory Hazardous Waste Management

The hazardous waste section of this guide will discuss the *Dangerous Waste Regulations,* Chapter 173-303 WAC, including designating wastes; generator status; counting your wastes; satellite accumulation requirements; and treating wastes.

The Washington State Department of Ecology publications that have been included or referenced in this guide are: 1) Designating Dangerous Waste, (fact sheet # 96-436); 2) Counting Dangerous Waste Under the *Dangerous Waste Regulations*, (Pub. #98-414); 3) Satellite Accumulation, (TIM #94-120); and 4) Treatment by Generator, (TIM #96-412).

Designating Dangerous Waste

As a business in Washington State, you are responsible for knowing what and how much dangerous waste you generate. The *Dangerous Waste Regulations*, in Section 173-303-070 describe the characteristics or properties that cause a waste to be considered dangerous, and what amounts of waste cause you to be regulated as a dangerous waste generator. This guide leads you through the steps that you must take to determine whether you generate a dangerous waste subject to special handling requirements. This process of classifying wastes is called "designation." The document also contains a flow chart that can be used along with a copy of the *Regulations* to help you designate wastes more easily and accurately.

The designation process identified in this guide is appropriate for most waste streams. Generators should be aware, however, that exclusions exist for certain waste streams. The majority of these exclusions may be found in 173-303-071 WAC.

What you need to know to start

Look around your facility and locate all of the wastes and processes that generate waste. You need to know how much of each waste you generate each month, and how much of each waste you have accumulated on-site. You will also need to know something about the physical and chemical nature of your wastes. It is usually necessary to know the name of all chemical components that make up the specific waste stream.

Material Safety Data Sheets may tell you something about the physical and chemical properties of your waste. They might also show the names of the chemicals used in a product. Without this type of information about your waste, you may have to test each waste stream to determine if it is dangerous waste.

The following pages describe a three-step process designed for people who intend to dispose of their wastes. You will need a copy of the *Dangerous Waste Regulations* to use as a reference. If you are recycling or reusing your wastes, refer to Sections -016, -017, and -120 of the *Dangerous Waste Regulations.* You can order other publications by calling (800) 633-7585.

Step 1 - Inventory Your Wastes

Find out what wastes you have, and how much waste you generate each month and accumulate on-site at any one time before disposal. Write these quantities in the Waste Inventory section of the Generator Status Worksheet printed on page 3.

Step 2 - Designating

For each of your wastes, follow the Dangerous Waste Designation Flow Chart that begins on page 5. This flow chart leads you through a series of questions that will help you to decide if your waste is dangerous.

All dangerous wastes have a four-digit code number assigned to them based on their properties. If your waste meets the definition of a particular type of dangerous waste, write the four-digit waste number in the **Designation** (waste number) column of the Waste Inventory table on page 3.

Using the flow chart, write down all of the waste numbers that apply to your waste on the **Generator Status** section of the worksheet. Stop when you reach a box on the flow chart that reads, "No further designation is required."

Step 3 - Generator Status

After tracing each waste through the flow chart, go back to the generator status worksheet and follow the instructions. Add up all of the pounds of wastes that have been assigned Designation waste numbers. You can now determine if you are a small, medium or large quantity generator, and what you must do to correctly handle your waste. You may be:

- a ***small quantity generator*** (SQG) and responsible only for following the handling requirements described in WAC 173-303-070(8) in addition to any county or city hazardous waste management requirements; or

- a ***medium quantity generator*** (MQG) and required to follow the standards listed by WAC 173-303-201 and -202; or

- a ***large quantity generator*** (LQG) subject to full regulation under the requirements of WAC 173-303-170 and -200.

Generator Status Worksheet

Waste Inventory: Fill in the spaces below for each of your waste streams. First, write in the waste name, number of pounds you generate each month, and the number of pounds you accumulate on-site at any time. Once this information is complete, go through the steps of the flow chart to find out which dangerous waste numbers apply to your waste. Write in all of the dangerous waste numbers that apply to each waste in the spaces marked "Designation Waste Numbers".

	Waste Name	Pounds Generated Each Month	Pounds Accumulated On-site	Designation Waste Number(s)
Waste 1.	_____	_____	_____	_____
Waste 2.	_____	_____	_____	_____
Waste 3.	_____	_____	_____	_____
Waste 4.	_____	_____	_____	_____
Waste 5.	_____	_____	_____	_____
Waste 6.	_____	_____	_____	_____
Waste 7.	_____	_____	_____	_____
Waste 8.	_____	_____	_____	_____
Waste 9.	_____	_____	_____	_____

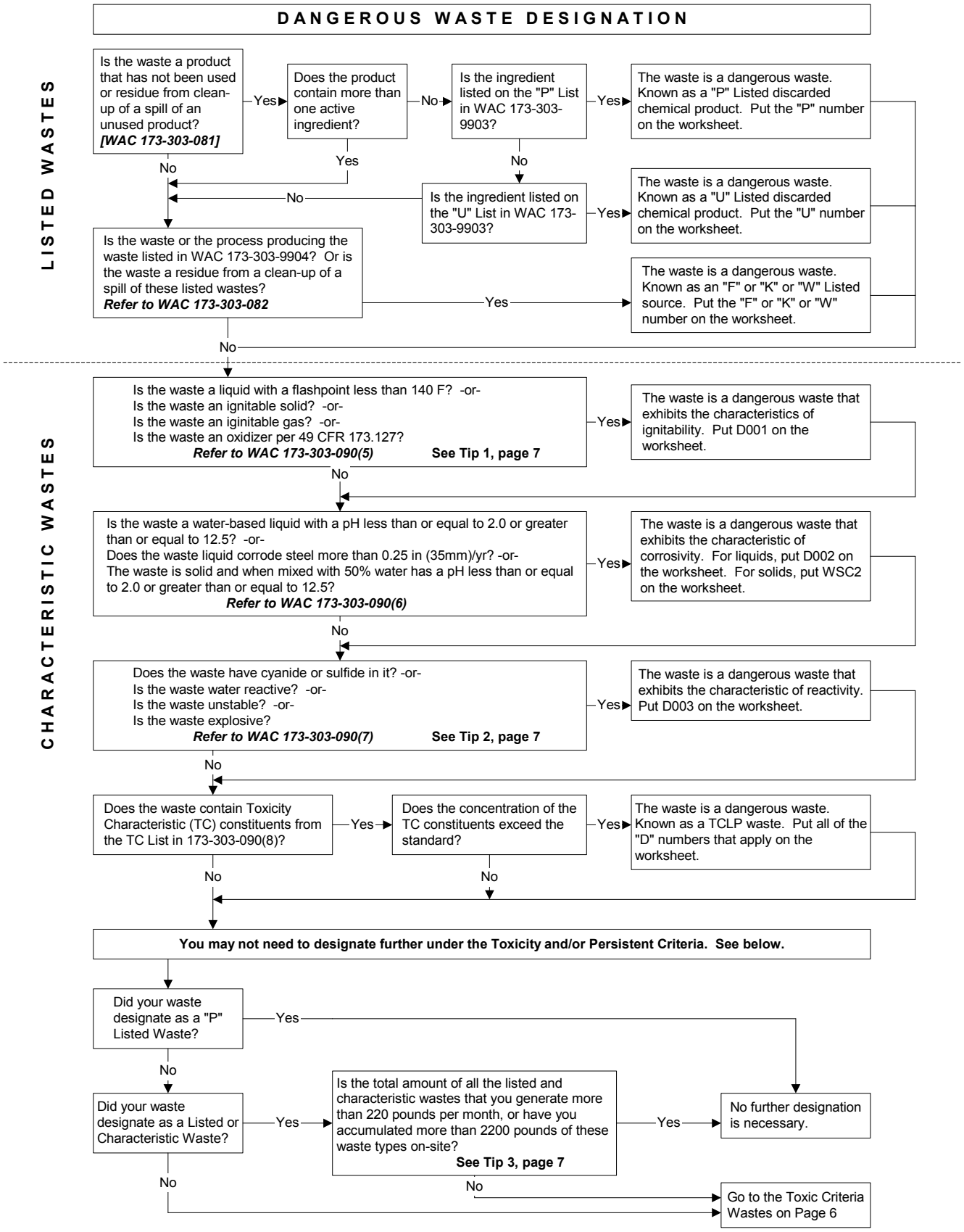
Waste Totals: Add up the amount of waste you generate and/or accumulate on-site at any time that has any of these waste numbers: any number beginning with P, WT01, F020-F023, F026, F027. Write these quantities on Line 1 below. Then total the amount of all other wastes that are "dangerous wastes" and write in those amounts on Line 3.

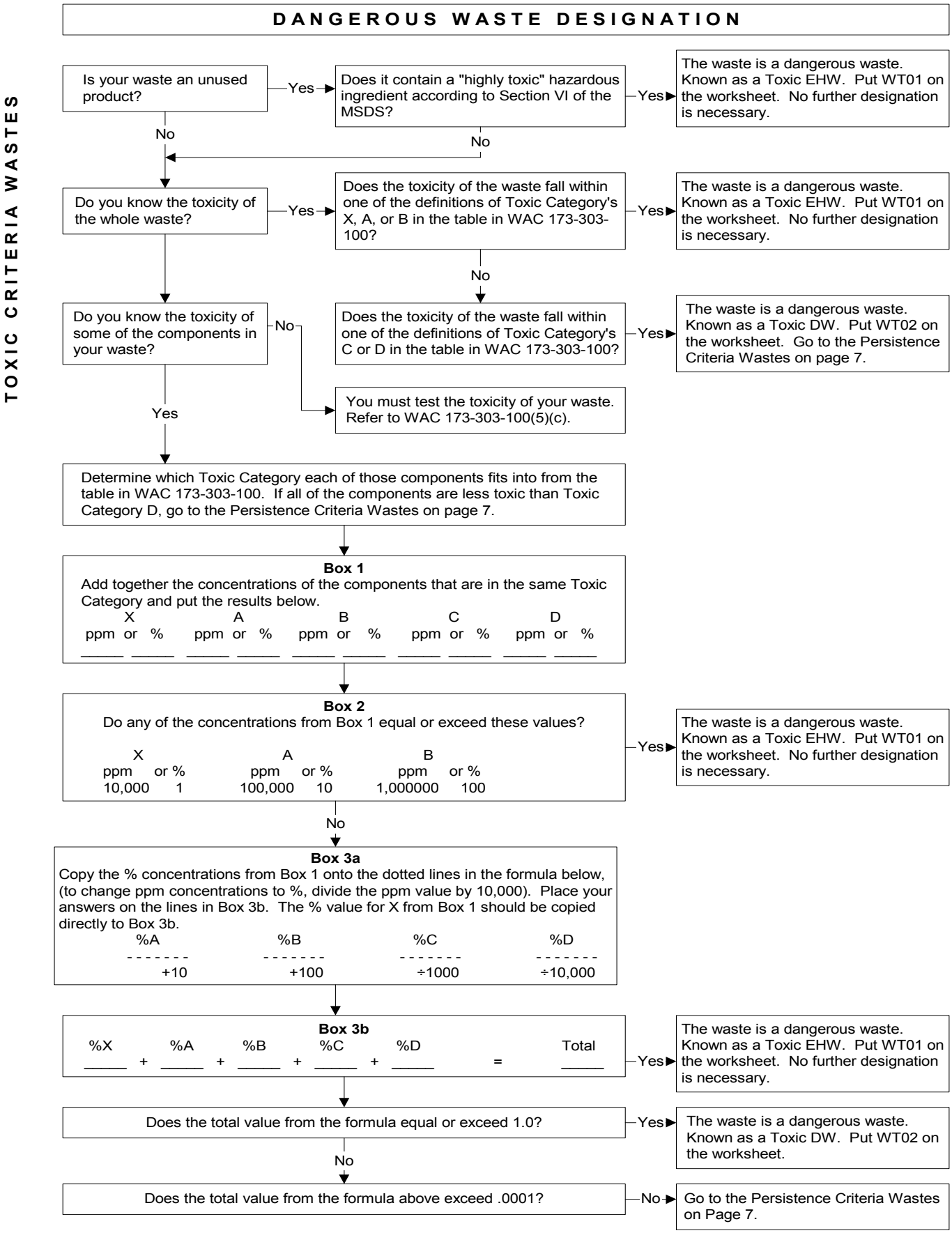
	Wastes	Pounds Generated Each Month	Pounds Accumulated On-site
Line 1.	All numbers beginning with P, WT01, F020-F023, F026, F027	_____	_____
Line 2.	Spill residues from all Dangerous Waste numbers	_____	_____
Line 3.	All other Dangerous Waste numbers	_____	_____

Generator Status

Compare your totals to the quantities listed below to determine your generator status:

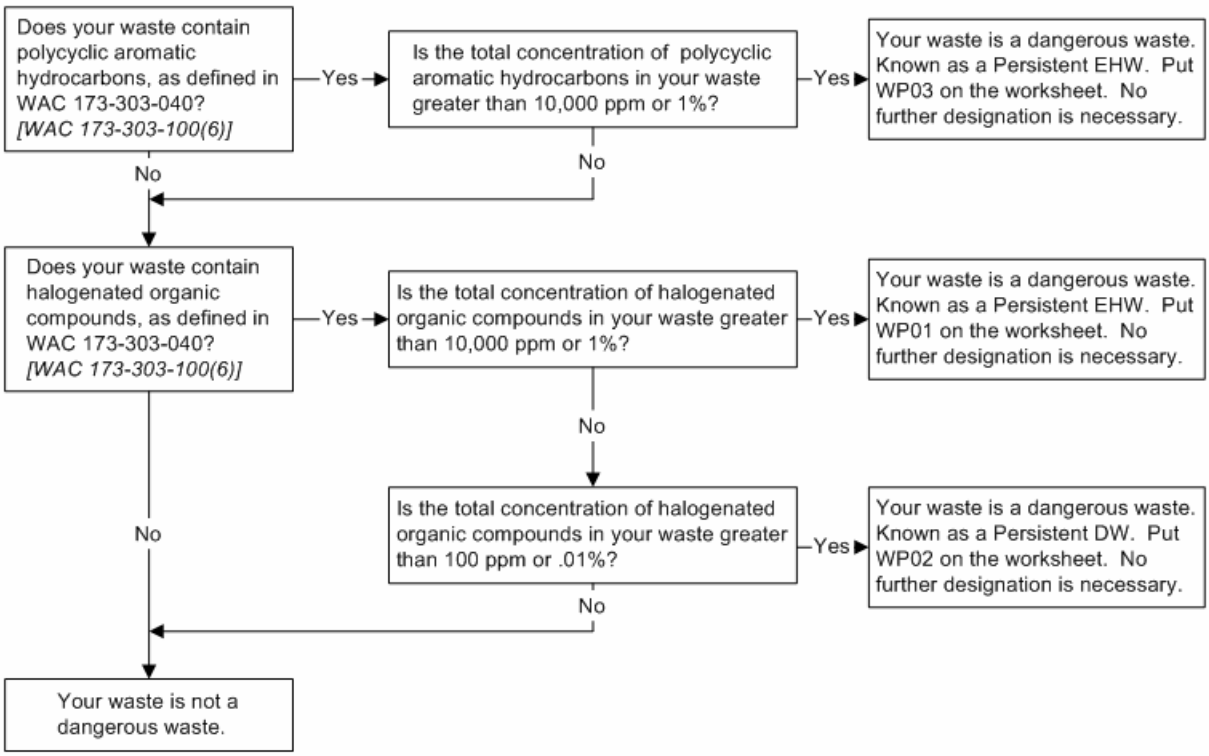
	Pounds Generated Each Month		Pounds Accumulated On-site
You are a Small Quantity Generator if:			
Line 1 quantities are less than	2.2 pounds	and	2.2 pounds
and			
Line 2 quantities are less than	220 pounds	and	220 pounds
and			
Total of Lines 1, 2 and 3 is less than	220 pounds	and	2200 pounds
You are a Medium Quantity Generator if:			
Line 1 quantities are less than	2.2 pounds	and	2.2 pounds
and			
Total of Lines 1, 2 and 3 is less than	2200 pounds	and	2200 pounds
You are a Large Quantity Generator if:			
Line 1 quantities are more than	2.2 pounds	or	2.2 pounds
or			
Total of Lines 1, 2 and 3 is more than	2200 pounds	or	2200 pounds


DANGEROUS WASTE DESIGNATION
LISTED WASTES
Is the waste a product that has not been used or residue from clean-up of a spill of an unused product? [WAC 173-303-081]
Yes
Does the product contain more than one active ingredient?
No
Is the ingredient listed on the "P" List in WAC 173-303-9903?
Yes
The waste is a dangerous waste. Known as a "P" Listed discarded chemical product. Put the "P" number on the worksheet.
Yes
No
No
No
Is the ingredient listed on the "U" List in WAC 173-303-9903?
Yes
The waste is a dangerous waste. Known as a "U" Listed discarded chemical product. Put the "U" number on the worksheet.
Is the waste or the process producing the waste listed in WAC 173-303-9904? Or is the waste a residue from a clean-up of a spill of these listed wastes? Refer to WAC 173-303-082
Yes
The waste is a dangerous waste. Known as an "F" or "K" or "W" Listed source. Put the "F" or "K" or "W" number on the worksheet.
No
CHARACTERISTIC WASTES
Is the waste a liquid with a flashpoint less than 140 F? -or-
Is the waste an ignitable solid? -or-
Is the waste an iginitable gas? -or-
Is the waste an oxidizer per 49 CFR 173.127?
Refer to WAC 173-303-090(5) See Tip 1, page 7
Yes
The waste is a dangerous waste that exhibits the characteristics of ignitability. Put D001 on the worksheet.
No
Is the waste a water-based liquid with a pH less than or equal to 2.0 or greater than or equal to 12.5? -or-
Does the waste liquid corrode steel more than 0.25 in (35mm)/yr? -or-
The waste is solid and when mixed with 50% water has a pH less than or equal to 2.0 or greater than or equal to 12.5?
Refer to WAC 173-303-090(6)
Yes
The waste is a dangerous waste that exhibits the characteristic of corrosivity. For liquids, put D002 on the worksheet. For solids, put WSC2 on the worksheet.
No
Does the waste have cyanide or sulfide in it? -or-
Is the waste water reactive? -or-
Is the waste unstable? -or-
Is the waste explosive?
Refer to WAC 173-303-090(7) See Tip 2, page 7
Yes
The waste is a dangerous waste that exhibits the characteristic of reactivity. Put D003 on the worksheet.
No
Does the waste contain Toxicity Characteristic (TC) constituents from the TC List in 173-303-090(8)?
Yes
Does the concentration of the TC constituents exceed the standard?
Yes
The waste is a dangerous waste. Known as a TCLP waste. Put all of the "D" numbers that apply on the worksheet.
No
No
You may not need to designate further under the Toxicity and/or Persistent Criteria. See below.
Did your waste designate as a "P" Listed Waste?
Yes
No
Did your waste designate as a Listed or Characteristic Waste?
Yes
Is the total amount of all the listed and characteristic wastes that you generate more than 220 pounds per month, or have you accumulated more than 2200 pounds of these waste types on-site?
See Tip 3, page 7
Yes
No further designation is necessary.
No
No
Go to the Toxic Criteria Wastes on Page 6


TOXIC CRITERIA WASTES
DANGEROUS WASTE DESIGNATION
Is your waste an unused product?
Yes
Does it contain a "highly toxic" hazardous ingredient according to Section VI of the MSDS?
Yes
The waste is a dangerous waste. Known as a Toxic EHW. Put WT01 on the worksheet. No further designation is necessary.
No
No
Do you know the toxicity of the whole waste?
Yes
Does the toxicity of the waste fall within one of the definitions of Toxic Category's X, A, or B in the table in WAC 173-303-100?
Yes
The waste is a dangerous waste. Known as a Toxic EHW. Put WT01 on the worksheet. No further designation is necessary.
No
Do you know the toxicity of some of the components in your waste?
No
Does the toxicity of the waste fall within one of the definitions of Toxic Category's C or D in the table in WAC 173-303-100?
Yes
The waste is a dangerous waste. Known as a Toxic DW. Put WT02 on the worksheet. Go to the Persistence Criteria Wastes on page 7.
You must test the toxicity of your waste. Refer to WAC 173-303-100(5)(c).
Yes
Determine which Toxic Category each of those components fits into from the table in WAC 173-303-100. If all of the components are less toxic than Toxic Category D, go to the Persistence Criteria Wastes on page 7.
Box 1
Add together the concentrations of the components that are in the same Toxic Category and put the results below.
X ppm or % _____ _____
A ppm or % _____ _____
B ppm or % _____ _____
C ppm or % _____ _____
D ppm or % _____ _____
Box 2
Do any of the concentrations from Box 1 equal or exceed these values?
X ppm or % 10,000 1
A ppm or % 100,000 10
B ppm or % 1,000000 100
Yes
The waste is a dangerous waste. Known as a Toxic EHW. Put WT01 on the worksheet. No further designation is necessary.
No
Box 3a
Copy the % concentrations from Box 1 onto the dotted lines in the formula below, (to change ppm concentrations to %, divide the ppm value by 10,000). Place your answers on the lines in Box 3b. The % value for X from Box 1 should be copied directly to Box 3b.
%A ------- +10
%B ------- +100
%C ------- ÷1000
%D ------- ÷10,000
Box 3b
%X _____ + %A _____ + %B _____ + %C _____ + %D _____ = Total _____
Yes
The waste is a dangerous waste. Known as a Toxic EHW. Put WT01 on the worksheet. No further designation is necessary.
Does the total value from the formula equal or exceed 1.0?
Yes
The waste is a dangerous waste. Known as a Toxic DW. Put WT02 on the worksheet.
No
Does the total value from the formula above exceed .0001?
No
Go to the Persistence Criteria Wastes on Page 7.

DANGEROUS WASTE DESIGNATION

PERSISTENT CRITERIA WASTES



TIP 1
These definitions correspond to U.S. Department of Transportation (USDOT) regulations. If your waste is an unused product that has USDOT flammable, ignitable solid, oxidizer, or peroxide labels then it meets the definition of ignitable waste.

TIP 2
The definition of reactive waste and explosive waste corresponds to USDOT regulations. If your waste is an unused product that carries these warning labels then the waste meets the definition of dangerous waste.

TIP 3
If you are designating more than one waste you should designate them all to this point before you go further so you can use the total amounts to answer the question in this box.

Counting Wastes

Counting Dangerous Waste Under the *Dangerous Waste Regulations*

Dangerous waste generators must count their waste each calendar month. Dangerous waste must be counted to determine generator status (small, medium, or large quantity generator). Generator requirements are different for each of the generator status categories. The amount of waste you generate also determines if you need to submit a pollution prevention plan for your facility. If you are an academic facility, you must count the dangerous waste generated campus-wide each calendar month. The following six sections provide details on how to count waste in various situations.

I. Counting Stored and/or Accumulated Dangerous Waste

Dangerous waste counted under the accumulation regulations:
Dangerous waste is counted at the point of generation prior to storage or accumulation in the generator's 90 or 180 day accumulation area. Likewise, dangerous waste accumulated under the satellite accumulation (SA) provisions (WAC 173-303-200) is also counted toward the generator's status on a monthly basis.

Dangerous waste not counted under the accumulation regulations:
It is not necessary to count the dangerous waste again when it is moved from satellite accumulation to the generator's 90 or 180 day accumulation area.

Satellite Accumulation:
Dangerous waste accumulated in a satellite accumulation area must be counted towards the generator's monthly total, for determining the generator's status. Satellite accumulation is defined as a location at or near the point of hazardous waste generation, where waste is initially accumulated in containers before consolidating it at a designated accumulation area (*i.e.,* Centralized Dangerous Waste Storage /Accumulation Area). The Satellite Accumulation provisions are: 1) 55 gallons of each dangerous waste or 1 quart of each acutely hazardous waste can be accumulated; 2) The satellite area must be secured and under the control of the process operator; 3) Satellite accumulation is allowed without a permit provided the generator complies with these WAC 173-303 sections:

- Container labeling/marking requirements -200 (1)(d)
- Condition of containers -630 (2)
- Compatibility of waste with containers -630 (4)
- Containers be closed -630 (5)(a)
- Container handling to prevent leaks -630 (5)(b)
- Special requirements for ignitable or reactive wastes -630 (8)(a), and
- Special requirements for incompatible wastes -630 (9)(a) & (b).

When 55 gallons of dangerous waste or 1 quart of acutely hazardous waste is accumulated per waste stream (each accumulation area is limited by volume, up to 55 gallons of dangerous waste or 1 quart of acutely hazardous waste), the container(s) must be marked immediately with accumulation date. The waste must be moved within three days to the designated storage/accumulation area.

II. Counting and Recycling/Excluded Wastes in General

As a general "rule," dangerous waste that is stored, disposed of, treated, recycled, or manifested is counted. However, there are exceptions to this "rule" where some dangerous wastes are not counted. These exceptions involve wastes being recycled a certain way or when a waste or management activity fulfills the requirements of a conditional exclusion.

"Recycle" means to use, reuse, or reclaim a material. "Use or reuse" means to employ a material as an ingredient in an industrial process or an effective substitute for a commercial product without first being reclaimed. Dangerous wastes may be used/reused, as described above, in such a way that they are removed from the status of a solid waste (WAC 173-303-017(2 and 3)) and not counted. The reason for this is that certain waste materials can be used/reused in ways that are not considered to involve waste management and become exempt from the *Dangerous Waste Regulations*.

Some dangerous wastes hold conditional exclusions from the *Dangerous Waste Regulations*. When specific terms of an exclusion are met, Ecology conditionally excludes the waste. This is because the materials are not dangerous waste, are regulated under some other state and federal programs, or are recycled in ways which do not threaten public health or the environment. When the specific terms of an exclusion are met, the dangerous waste may become conditionally excluded from rule and not counted (WAC 173-303-071). A few examples include treated wood waste, polychlorinated biphenyls (PCBs), waste generated in a product or raw material storage tank until removed, and waste reclaimed and reused in a closed loop system.

The *Dangerous Waste Regulations* list certain dangerous wastes that are not counted when recycled in a certain way. Like the excluded categories of waste, recyclable materials must be recycled following specific conditions. When the conditions are met, the waste is not counted toward the generator's status. Refer to WAC 173-303-070(7)(c & d). Examples of wastes having recycling conditions include used oil, spent CFC and HCFC refrigerants, spent lead acid batteries, used batteries, scrap metal, spent antifreeze, waste recycled without prior storage or accumulation and waste recycled under the "multiple counting exemption" such as when a material is reclaimed and reused many times within one month.

III. Counting and Recycling Without Prior Accumulation or Storage

Under this counting exclusion there can be no storage or accumulation prior to the recycling activity. The advantage to the generator, then, would be no counting of the dangerous waste entering the recycling unit. "Without prior storage or accumulation" means that as soon as the waste is generated it immediately enters the recycling unit. Wastes could be carried in containers, for example, only if the waste is transferred immediately upon generation to the recycling unit. For more details, refer to WAC 173-303-070(7)(c)(iv).

Dangerous waste counted with no prior storage or accumulation:
Dangerous waste residues generated from the recycling activity are counted.

Dangerous waste not counted without prior storage or accumulation:
Dangerous waste are not counted when it can be recycled on-site, without first being stored or accumulated, only in an on-site process subject to regulation under WAC 173-303-120(4)(a).

IV. Counting and the Domestic Sewage Exclusion

The Domestic Sewage Exclusion (DSE) allows dangerous waste to be discharged to a publicly-owned treatment works (POTW) only when such wastes are treatable at the POTW, and the discharger has a permit which authorizes the discharge of certain waste described in the permit. The dangerous waste is only excluded from the *Dangerous Waste Regulations* after it enters the sanitary sewer system. For additional guidance on the Domestic Sewage Exclusion, refer to Ecology's Technical Information Memorandum (TIM) titled, "*Domestic Sewage Exclusion*," publication number 94-136 and WAC 173-303-071(3)(a).

Dangerous waste counted under the DSE:
Dangerous waste managed prior to being directly discharged under the DSE to the sanitary sewer system is counted. This means dangerous waste stored, treated, or recycled prior to the point of direct discharge is counted.

Dangerous waste not counted under DSE:
As a policy, Ecology will not require dangerous wastes mixed with domestic sewage to be counted when the waste is being directly discharged into the POTW system in compliance with the domestic sewage exclusion (WAC 173-303-071(3)(a)).

V. Counting and Treatment By Generator

The "Treatment by Generator" (TBG) provisions found in WAC 173-303-170(3) and –200 allow generators to treat their own dangerous waste on-site without obtaining a RCRA "TSD" treatment permit. For additional guidance, refer to TIM Number 96-412 (revised May 1999), titled "Treatment By Generator."

Dangerous waste <u>counted</u> under TBG:
Dangerous waste intended for treatment under the TBG allowance is counted toward the generator's status before it is treated. A TBG activity is considered a separate activity from the production or cleaning process originally generating the dangerous waste. Therefore, dangerous waste derived (generated) from a TBG activity is also counted toward the generator's status.

Dangerous waste <u>not counted</u> under TBG:
Waste not counted under TBG includes wastes derived from the TBG activity which do not designate as dangerous waste. Also, dangerous wastes from TBG activities that are directly discharged into the POTW system in compliance with the domestic sewage exclusion (WAC 173-303-071(3)(a)) are not counted.

VI. Counting and Permit by Rule

The permit-by-Rule (PBR) provisions allow on-site treatment of dangerous waste without a written RCRA "TSD" treatment permit under certain conditions. For PBR to apply, generators must treat their waste only in a wastewater treatment unit, elementary neutralization unit, or totally enclosed treatment unit (WAC 173-303-040 and –802(5).

Dangerous waste <u>counted</u> under PBR:
Dangerous wastes removed from the PBR unit and no longer covered by the PBR provisions, such as sludge removed for land disposal, are counted.

Dangerous waste <u>not counted</u> under PBR:
Wastes managed immediately upon generation in an on-site PBR unit are not counted. The key term in this provision is "immediately," which means that as soon as the waste is generated it must directly enter a PBR unit. There is no temporary storage, accumulation or other type of management of waste between the point of generation and the PBR unit. Also, dangerous wastes discharged in compliance with the PBR provisions are not counted. For example, wastes discharged in compliance with the unit's NPDES discharge permit.

Treatment by Generator

You can treat some of your laboratory waste in your laboratory without a permit. Described below are the "treatment by generator" (TBG) methods that are allowed without a permit. Before treating a waste you must know if any of the following restrictions apply: land disposal restriction standards, wastewater disposal limits and restrictions, when "permit by rule" standards apply or if a RCRA "TSD" treatment permit would be necessary. A permit or permission might be necessary when you are doing treatment that does not fit within the categories below. Contact your local Washington State Department of Ecology Regional Office (addresses and phone numbers listed in back of this guide), and ask for a Hazardous Waste Inspector if you have any questions about treatment methods, information on treatment permits or are seeking permission to conduct treatment without a permit. Ask for someone from the Water Quality Section if you have questions on disposing wastes down the drain or wastewater discharge permits. We strongly encourage you to find an alternative to disposing wastes down the drain.

When doing treatment by generator, you must record the date of treatment, hazardous waste constituents, treatment method(s), and pounds of waste treated. This is very important because the amount of waste generated before treatment must be reported to Washington State Department of Ecology in your annual hazardous waste report.

Remember, you may need to do multiple treatment methods to remove all hazardous waste constituents. Record all treatment methods used on the treatment log. A sample log sheet is provided on page 14.

Treatment by Generator Methods

In this section, six treatment methods are summarized. Guidance for each of these methods can be obtained by calling Ecology's publication office at (800) 633-7585.

Solidification Or Stabilization

Solidification or stabilization reduces the mobility of dangerous waste and/or the toxicity of pollutants. Solidification reduces or eliminates the free liquids in the waste. Stabilization limits the hazard potential of a dangerous waste by converting the constituents into a less soluble form. The solidified waste must pass the Paint Filter Liquids Test (PFLT). The waste must be solidified by using non-biodegradable solidification materials. The solidified waste must be resistant to change due to temperature, wet/dry cycling, radiation exposure, chemical exposure, and compressive forces.

Elementary Neutralization

Elementary neutralization reduces the corrosivity (acidic or caustic properties) of a waste. The material's pH is raised or lowered to a more neutral pH range between 6 and 9. Neutralization should be done by trained staff. Elementary neutralization treatment residuals must be managed and disposed in accordance with state and local regulations. If there are any other dangerous waste constituents in the waste, the waste must be disposed and coded in accordance with the proper disposal requirements. Know and observe local wastewater discharge limits and restrictions.

Carbon Adsorption

Carbon adsorption uses molecular attraction to bind soluble and gaseous chemicals to carbon. The carbon removes the chemical contaminants until its adsorptive capacity is reached. Carbon can be used to remove metals, organic solvents, inorganic and organic contaminants from wastes. See the specific TBG guidance on Carbon Adsorption for examples of how well various chemicals adsorb. Effluent, backwash and spent carbon must be managed in accordance with all regulations. There should be no releases to the environment. All equipment should be decontaminated as needed.

Separation

Separation may be accomplished using air flotation, centrifugation, coagulation or flocculation, decanting, emulsion breaking or demulsification, ion exchange, oil skimming or phase separation, precipitation, sedimentation, or clarification. See the specific TBG guidance on Separation for description and definitions of separation techniques. Assure that ignitable or reactive waste treatment complies with WAC 173-303-640(9)(a). The treatment process should not alter chemical structure except to form a precipitate. No process may emit air pollutants.

Filtering

Filtering dewaters waste effluents, slurries, and sludges, and removes undissolved heavy metals present in suspended solids. Filtration uses pressure to move water through the filter media, leaving solids behind. Done correctly, filtering should not pose a threat to the environment. Filtered liquid and filter/filter cake should be appropriately managed. All equipment should be decontaminated as needed.

Evaporation

Evaporation removes water from wastes to reduce the weight and volume before disposal. Evaporators are appropriate for concentrating certain inorganic wastes (no organic evaporation). The process must not pose a threat to the environment or to public health. Do not "overcook" evaporator waste. Appropriately dispose of sludge wastes. Incorporate secondary containment around evaporator to catch spills.

Sample

Treatment Log

DATE OF TREATMENT	HAZARDOUS WASTE CONSTITUENTS	TREATMENT METHODS	AMOUNT OF WASTE TREATED	COMMENTS

Laboratory Hazardous Waste Management
Practical Do's and Don'ts

Do's

- Identify your hazardous wastes. Use the hazardous waste determination flow chart provided in this document.

- Keep records of hazardous waste activities. Determine your entire facility's or institution's generator status. There are different requirements depending on generator status. Know the requirements that apply to you.

- Use secondary containment for all hazardous wastes stored. Keep the secondary containment dry. Accumulate wastes according to standards. Store reactive and ignitable wastes according to the Uniform Fire Code. Maintain 30 inches of space between incompatible wastes.

- Label hazardous waste with "hazardous" or "dangerous" waste, waste name, hazards, and the date the waste was placed in the container. Ensure that labels are visible and legible.

- Check containers to ensure they are securely closed and not leaking. Use the proper type of container for the waste. Maintain containers and replace them as necessary.

- Keep a log of wastes treated or recycled on-site. The log should record the date that treatment or recycling occurred, the amount of waste treated or recycled, and what type of treatment or recycling was performed.

- Arrange for proper hazardous waste transportation and disposal. Remember to manifest hazardous waste prior to shipment.

- Send back unused chemicals to the manufacturer whenever possible.

Don'ts

- Don't store waste in your laboratory. Waste should be removed from laboratory satellite accumulation areas regularly. Don't accumulate over fifty-five gallons of any one hazardous waste in a satellite accumulation area. The accumulation "time-limit" begins when more than fifty-five gallons is accumulated or when waste is transferred to the central hazardous waste storage area.

- Don't dispose of hazardous wastes down the drain. Be aware that local wastewater treatment authorities may have discharge limits on non-hazardous waste. Check with your local authorities before discharging wastes to the sewer.

- Don't dilute wastes to meet sewer discharge limits. This dilution is illegal. Dilution is not a solution.

- Don't discharge laboratory wastes to septic systems.

- Don't dispose of hazardous waste in solid waste receptacles.

- Don't evaporate volatile organic compounds.

- Don't dispose of waste that can be recycled or reclaimed. Recycle and reclaim as many chemicals as possible on-site or through a commercial recycler. Use chemical exchanges such as IMEX or Portland Chemical Consortium. (See Section 6, Sources)

Section 2
Hazardous Materials Identification System

The Hazardous Materials Identification System (HMIS) helps satisfy the hazard communication standard (HCS) requirements of OSHA by providing a format for hazard determinations, offering a basic written hazard communication program, and simplifying the employee training and information process. HMIS provides clear, recognizable information to employees by standardizing the presentation of chemical label information. This is accomplished by using color codes to correspond to the hazards of a product, assigning numeric ratings for the degree of hazard, and using alphabetical codes to indicate the appropriate personal protective equipment (PPE) employees should wear while handling the material.

The lettering system indicates the level of PPE to be worn to work safely with a material. The original system used letters of the alphabet corresponding to a specific group of PPE. However, this did not allow employers to customize their PPE recommendations. Now employers can develop individual groups of PPE's and assign them the letters from L-Z.

The use of an asterisk (*) next to the numerical ranking designates the material as a carcinogen or a material known to have an adverse effect after chronic exposure. This information is of great benefit to laboratory workers, since this helps indicate those materials that may affect them over the long run.

The Hazardous Materials Identification System provides a rating system for a material's reactivity, health, flammability and what type of PPE is required.

Hazardous Materials Identification System Ratings

Reactivity

Rating	Susceptibility to Release of Energy
0	Normally stable materials, even under fire conditions. Do not react with water.
1	Normally stable materials which may become unstable under fire conditions or at elevated temperatures or pressures. May react with water, but not violently.
2	Materials which are normally unstable and readily undergo violent chemical change but do not detonate. Includes materials which react violently with water, and other materials which undergo chemical change at normal temperatures and pressures and violent reaction at elevated temperatures and pressures.
3	Materials which are capable of detonation, but require a strong initiating source or which must be heated under confinement before initiation. Includes materials which are sensitive to thermal or mechanical shock at elevated temperatures and pressures. Also includes those materials which react explosively with water without heat or confinement.
4	Materials which in themselves are readily capable of detonation or explosive reaction at normal temperatures and pressures. Includes materials which are sensitive to mechanical or localized thermal shock.

Health

Rating	Type of Possible Injury
0	Materials that on exposure under fire conditions offer no hazard beyond that of ordinary combustible materials.
1	Materials that on exposure would cause irritation but only minor residual injury.
2	Materials that on intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.
3	Materials that on short exposure could cause serious temporary or residual injury.
4	Materials that on very short exposure could cause death or major residual injury.

Flammability

Rating	Hazard Description
0	Materials that will not burn.
1	Materials that must be preheated before they will ignite.
2	Materials that must be moderately heated or exposed to relatively high ambient temperatures before they will ignite.
3	Liquids and solids that can ignite under almost all temperature conditions.
4	Materials which will rapidly vaporize at atmospheric pressure and normal temperatures, or are readily dispersed in air and which burn readily.

Hazardous Materials Identification System

Personal Protective Equipment Codes

Please copy and post this list wherever it is needed inside a lab.

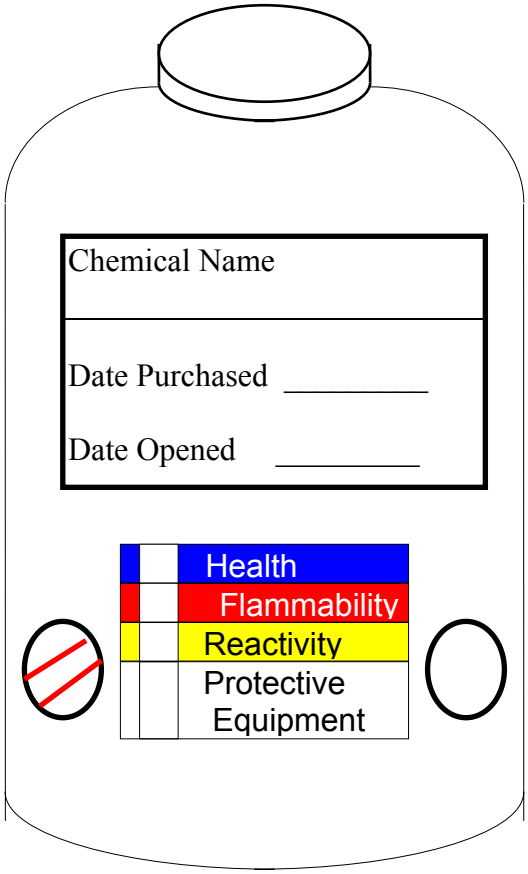
A	ANSI Z87.1 approved safety goggles
B	ANSI Z87.1 approved safety goggles and gloves*
C	ANSI Z87.1 approved safety goggles, gloves* and an apron
D	Face shield, gloves* and an apron
E	ANSI Z87.1 approved safety goggles, gloves* and a NIOSH approved dust respirator
F	ANSI Z87.1 approved safety goggles, gloves*, apron and a NIOSH approved dust respirator
G	ANSI Z87.1 approved safety goggles, a NIOSH approved respirator (use appropriate filter cartridges and fit testing)
H	Splash goggles, gloves*, apron and a NIOSH approved respirator (use appropriate filter cartridges and fit testing)
I	ANSI Z87.1 approved safety goggles, gloves* and a NIOSH approved dust respirator/(use appropriate filter cartridges and fit testing)
J	Splash goggles, gloves*, apron and a dust/(use appropriate filter cartridges and fit testing)
K	Airline hood or mask, gloves*, full suit and boots
L - Z	Custom PPE specified by employer

* Gloves can offer protection, but many kinds of gloves are not multipurpose. Nitrile gloves offer the most protection against tearing and are less porous to solvents and corrosives than latex gloves.

Hazardous Materials Inventory System Labels

Electronic versions of the labels that appear on the following pages can be printed from the disk that accompanies this training manual. These labels can be printed on a color printer and copied on a color copier. **These labels must be used in color**. Make as many copies as you need. If you need one size instead of all three sizes delete the ones you do not need. Copy a line of the size you need and paste until you fill your page.

How to Properly Label Lab Containers



Lab containers should have the above labels on them to adequately inventory and identify the chemicals inside the containers. The HMIS label can be printed from the disk and should be filled out completely. The Chemical Name label can also be printed from the disk. The date purchased and date opened should be recorded.

The color code location labels are the labels identified in this guide in column two of the chemical list table. The above colored dots are an *example* of something you may use. You can obtain colored dot labels from an office supply company. You could also use colored file labels, whatever works for you. To represent those colors you cannot buy, obtain white dots and color them yourself. **Do not** forget that numbers or words must be on the dots for certain chemicals. Again, refer to the chemical list table. You can also use the color-coding classification system explained in Section 5.

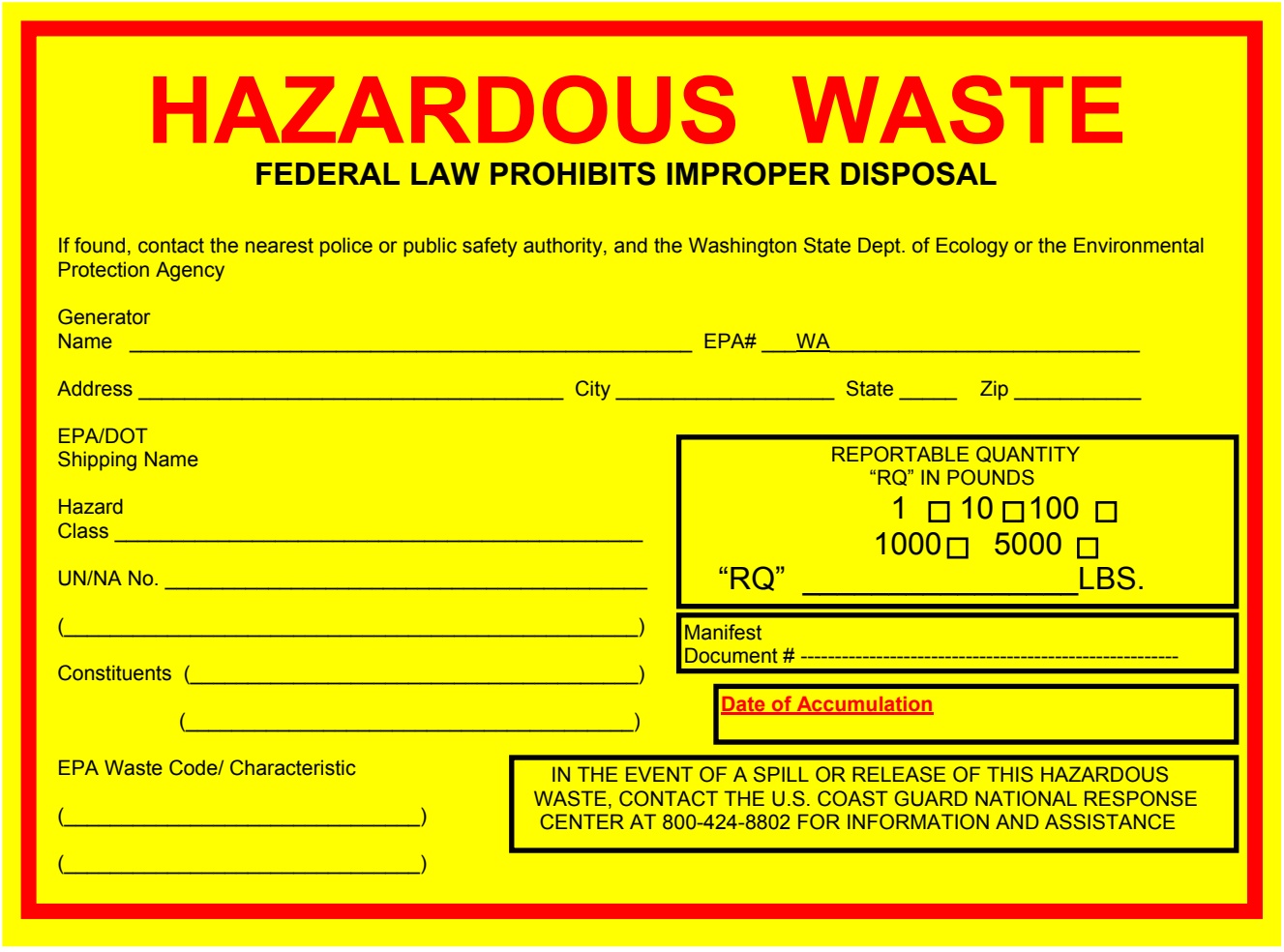
How To Label Hazardous Waste Storage Containers

This Hazardous Waste label is used for transporting waste and is a Department of Transportation required label. The State of Washington requires this label for shipping purposes as well. Prior to shipping, your waste label must have the following information:

1. Generator Name **2. EPA Identification Number**
3. Constituents **4. Date of Accumulation**

You are not required to fill in any of the other sections during accumulation. For purposes of accumulation this label can be printed in black and white. When your service provider comes to pick up the waste they will generally put their own label on the container with all of the information. If you have questions about how to complete this label, call your regional office of the Department of Ecology.

United States Department of Transportation Label



Affixing a label to a container:

1. Prep the container surface where you will tape the label.
2. Using clear acetate packaging tape or scotch tape, affix the label to the container. Cover the entire label so that drips and spills will not ruin or hide the label.

Section 3
Laboratory Waste Minimization

Laboratory Microscale

Microscale is one of the ways laboratories can minimize hazardous waste generation. Today, microscale can be used in a variety of applications, including academic institutions, research and commercial analysis.

Many high schools and colleges have converted to microscale. In academia, microscale can be used in inorganic, organic and general chemistry experiments. There are workshops available through The National Microscale Center at Merrimack College. They have hands-on, short courses for chemistry instructors at a minimal fee. They have courses demonstrating inorganic, organic and general chemistry microscale techniques for all levels of instruction. Microscale is extremely reproducible and reactions can readily be seen. Microscale is a great classroom tool; several phased experiments can be shown in one class session.

Sometimes research and commercial testing laboratories can also customize and scale down analysis to microscale. The National Microscale Center and many Universities have consultants that can help your laboratory convert to microscale. Your laboratory will need to customize the microscale techniques to your individual needs.

Microscale provides many benefits:

- Reduces costs in chemical purchases and hazardous waste disposal.
- Microscale glassware purchase payback is between 1 and 3 years.
- Up to 75% savings on chemicals used in experiments and analysis.
- Up to 75% reduction in hazardous waste being generated.
- Analysis and experiments are conducted in less than half the time.
- Significantly less glassware breakage (microscale glassware is more durable).
- Macro and micro equipment can be used together in many instances.
- Less hazardous chemical exposure to employees and students.
- Reduced need for ventilation and hoods.
- Explosions and fires are infrequent when using microscale.
- Less space is needed for chemical and hazardous waste storage.

Contact the National Microscale Center for more information:

Dr. Mono Singh
National Microscale Chemistry Center
Merrimack College
315 Turnpike Street
North Andover MA 01845
Phone: (508) 837-5137

Laboratory Waste Minimization
Practical Do's and Don'ts

Do's

- Purchase only the quantity of chemicals needed. Approximately 35% of all chemicals purchased end up as waste, in their original container.

- Use the minimum amount of chemicals required for each experiment or process to minimize the volume of waste being disposed.

- Reduce the scale of experiments and procedures. This will drastically reduce waste generation. There is micro/semi-micro equipment available through scientific glass manufacturers.

- Choose experiments or processes that do not use hazardous substances. Use instrumentation/analytical methods that eliminate use of hazardous chemicals. Often a non-hazardous chemical can be used in place of a hazardous chemical in a given process. Undertake any substitutions with extreme caution.

- Use multi-element standards for instrument calibration.

- Unused chemicals can often be sent back to the manufacturer. Use chemical exchanges. Chemical purchases can be reduced by borrowing or sharing chemicals between laboratories.

Don'ts

- Don't take donations of chemicals unless they are chemicals that you would otherwise have to purchase and the quality meets your needs.

- Don't use larger quantities for experiments than are needed to fulfill the purpose of the experiment.

Section 4
Laboratory Health and Safety

Laboratory Chemical Hygiene Plan

Laboratories in the State of Washington are required to have a written chemical hygiene plan to protect employees from health hazards and keep chemical exposure below limits, (WAC 296-62-400 Part Q, "Hazardous Chemicals in Laboratories.") Chemical hygiene plans must be available to employees, employee representatives and upon request, to the Director of the Department of Labor and Industries. The employer annually evaluates the usefulness of the chemical hygiene plan and updates it as needed. A "boilerplate" chemical hygiene plan is on the disk located in the back of this manual. This plan needs to be customized for your lab. A chemical hygiene plan must contain the following information:

- A standard operating procedure that addresses health and safety concerns when using hazardous chemicals.
- Engineered controls and hygiene practices must be used to reduce exposure to hazardous chemicals (hoods, sprinklers, eyewashes, personal protection equipment, etc.).
- All ventilation and protective equipment must be operating properly (eyewashes, hoods, respirators, etc.). Plan a maintenance schedule.
- Train employees on the use and management of hazardous chemicals to reduce the risk of exposure.
- Prior to implementing any particular laboratory operation, procedure or activity, approval from employer or employer's designee is required.
- Provide a medical monitoring program and examinations for all employees that have exposure or potential exposure to hazardous chemicals.
- Extremely hazardous substances shall be managed as follows: 1) Establish a designated storage area. 2) Use containment devices such as fume hoods. 3) Use waste handling procedures that insure safe removal of contamination. 4) Develop decontamination procedures.

The National Research Council recommends the following be addressed in the Chemical Hygiene Plan:

■ General principles

- Minimize all chemical exposures.
- Avoid underestimating risk.
- Provide adequate ventilation.
- Institute a chemical hygiene plan.
- Observe the PELs and TLVs.

- Permissible Exposure Limits (PEL) is a concentration limit that is the legal exposure limit (not recommended like TLV).
- Threshold Limit Value (TLV) is the concentration of a substance that is assumed you can be exposed to everyday without adverse effects.

■ Responsibilities

- Chief executive officer.
- Supervisor of administrative unit.
- Chemical hygiene officer.
- Laboratory supervisor.
- Project director.
- Laboratory worker.

■ The laboratory facility

- Design.
- Maintenance.
- Usage.
- Ventilation.

■ Components of the hygiene plan

- Basic rules and procedures.
- Chemical procurement, distribution and storage.
- Environment monitoring.
- Housekeeping, maintenance, and inspections.
- Medical program.
- Personal protective apparel and equipment.
- Records.
- Signs and labels.
- Spills and accidents.
- Training and information.
- Waste disposal.

■ General procedures for working with chemicals

- General rules for all laboratory work with chemicals.
- Allergens and embryotoxins.
- Chemicals of moderate or high acute toxicity.
- Chemicals of high chronic toxicity.
- Animal work with chemicals of high chronic toxicity.

■ Material safety data sheets

- Material Safety Data Sheets (MSDS) are required to be available in lab area.
- The MSDS have useful information on the hazards, management, storage and disposal of reagents.
- Read MSDS prior to using any chemicals and understand the information provided.
- If the MSDS have inadequate safety information contact manufacturer for more information.
- MSDS are available through your supplier, manufacturer or on the Internet.

Laboratory Health and Safety
Practical Do's and Don'ts

Do's

- Wear ANSI approved eye/face protection.
- Wear gloves that resist penetration of the specific chemical being used. Make sure there are no holes, rips, or tears in gloves.
- Wear a chemical resistant lab coat or apron. Restrain loose clothing and hair. Closed toe shoes should be worn.
- Wash hands frequently during and after working in the laboratory.
- Have an action plan in case of an emergency. Spill and fire repression equipment should be readily available. Inspect fire extinguishers monthly. Know how to use the equipment properly. Conduct annual fire and spill drills. Inform lab occupants of emergency procedures and escape routes.
- Ensure that eyewash fountains will supply at least 15 minutes of fresh water flow. Test and run eyewash weekly. Instruct lab staff on proper use of eyewash, including having the affected person roll eyeballs and lift lids. Keep path to eyewash unobstructed.
- Obtain Material Safety Data Sheets (MSDS) for each chemical. Review MSDS prior to using chemicals in the lab. Make sure co-workers/students know the necessary health and safety precautions and understand the MSDS's. Always inform co-workers when hazardous work is planned.
- Laboratory personnel should have training in first aid and CPR, and on handling hazardous materials and spill emergencies.
- Conduct internal environmental, health and safety internal audits annually. Work on improving procedures and correcting problems.
- Analyze new lab procedures and experiments for potential hazards before they are adopted.
- Maintain a log of safety-related incidents, even if there is no injury.

Don'ts

- Never eat, drink or smoke in the laboratory or storage room. Don't store food in a chemistry/ biology refrigerator or laboratory environment.
- Never pipette by mouth.
- Never leave heat sources unattended (gas burners, hot plates, sand baths, etc.).
- Don't store reagents or chemicals on lab bench. Make sure chemicals in use are kept away from the edge of lab bench. Be especially cautious when using reactive or highly toxic chemicals.
- Do not store chemicals above or around sinks. Don't mix chemicals in sinks.
- Don't intentionally evaporate organic wastes in the hood. Don't store chemicals or wastes in hood. Cover or berm all sinks in hoods to prevent spilled materials from entering sink drain. Never lean into the fume hood during use. Use proper ventilation systems/fume hoods while working with highly toxic and volatile substances.

Section 5

Steps to Compatible Laboratory Chemical Storage

Properly storing chemicals is one of the first steps a laboratory should take to improve practices. This section will help you comply with parts of the local Fire Codes, Washington Industrial Safety and Health Act (WISHA), Washington Administrative Code (WAC), and Occupational Safety and Health Administration (OSHA) regulations.

Fire Code

The Uniform Fire Code, Articles 79- Flammables and 80- Hazardous Chemical Storage requires: 1) Sources of ignition should be at least 25 feet from flammables stored in approved flammable cabinets. 2) Spill control materials and equipment should be available in the storage areas. 3) Secondary containment should be provided for all chemicals. 4) All chemicals should be separated by chemical compatibility. Provide a barrier (like a shelf or cabinet) between incompatibles. Do not store chemically reactive chemicals above or below each other. 5) A sprinkler system or a fire extinguisher should be installed. All chemicals that react with water must be stored in closed, water-resistant cabinets. 6) Earthquake protection should be installed for all shelving and cabinets. All shelves and cabinets must be bolted to the floor or wall.

Following the steps starting on the next page will give you a compatible chemical storage pattern. This system combines recommendations from the J.T. Baker and Flinn Scientific systems.

STEP 1: Separate chemicals into the following categories AND color code

Note: *If a chemical has more than one of the following hazards store it according to the most severe hazard and/or most stringent storage requirement.*

Flammable- (RED) Isolate inorganics from organics using tubs. Store in flame resistant cabinet. If the school does not have one, they should consider purchasing one if they have over five gallons of flammables. Examples include: *(organics)* Xylenes, ethers, alcohols, halogenated hydrocarbons (some), ketones, acetic acid; *(inorganics)* potassium sulfide, hydrogen sulfide, carbon, aluminum metal, powdered metals, magnesium, calcium.

Flammable- (RED STRIPE) Isolate from other flammables as they react with each other. Separate inorganics from organics. Examples include: *(organics)* acetaldehyde, phenol, acetic anhydride, acetyl chloride, benzene; *(inorganics)* sodium sulfide, potassium lump, phosphorus, iron powder, zinc, sodium lump, copper powder.

Reactive- (YELLOW) Isolate inorganics from organics. Segregate from other chemicals on separate shelf. Examples include: *(organics)* m-chloroperbenzoic acid; *(inorganics)* silver nitrate, lead nitrate, aluminum chloride, ammonium dichromate (ammonium nitrate needs to be stored separate from all chemicals).

Reactive- (YELLOW STRIPE) Isolate from other reactives as they react with each other. Separate inorganics from organics. Examples include: *(organics)* none;
(inorganics) peroxide, periodic acid, mercuric nitrate, iodine monochloride, bromine.

Corrosive/Contact Hazard- (WHITE) Separate organics from inorganics. Separate acids (preferably in an acid cabinet) from bases (preferably in a corrosive cabinet). Examples include: *(organics)* bases: p-toluenesulfonyl chloride; acids: trichloroacetic acid, sulfamic acid, oxalic acid, Bouin's solution; *(inorganics)* bases: tin, strontium, sodium hydroxide, soda lime, manganese-dilut, calcium-dilut; acids: sulfuric acid, hydrochloric acid, chromic acid, phosphoric acid, (nitric acid needs to be stored separate from all chemicals).

Corrosive/Contact Hazard- (WHITE STRIPE) Separate from other corrosive chemicals as they react together. Separate organics from inorganics. Separate acids (preferably in an acid cabinet) from bases (preferably in a corrosive cabinet. Examples include: *(organics)* bases: trifluoroacetic anhydride, tetrabutylammonium hydroxide, sebacoyl chloride; acids: lactic acid, chlorosulfonic acid; *(inorganics)* bases: potassium hydroxide, phosphorus oxychloride, lye, ascarite II, ammonium hydroxide; acids: none.

Toxic/Poisons/health hazard- (BLUE) Separate inorganics from organics. Separate from other chemicals on separate shelf or cabinet. Examples include: *(organics)* urethane, thioacetamide, toluene diisocyanate, saccharin sodium, halogenated hydrocarbons; *(inorganics)* wood's metal, thallium, strontium, sodium cyanide, silver iodide.

General Chemicals- (ORANGE or GREEN) These chemicals have slight or no hazards associated with them. Examples include: *(organics)* sorbic acid, stearic acid, succinic anhydride; *(inorganics)* sodium thiocyanate, stannous chloride, nickel, manganese oxide, calcium carbonate.

STEP 2

Separate chemicals within their color according to the inorganic and organic classifications

INORGANIC

Does not contain carbon except *Binary Compounds* (such as carbon oxides, carbon disulfides, carbides) and *Ternary Compounds* (such as metallic cyanides, calcium caronate, phosgene).

1. **(I-1A)** Metals, hydrides
   (**I-1B)** Zinc, Lithium, Manganese, Sodium, Potassium, Strontium
2. **(I-2A)** Halides, sulfates, sulfites, thiosulfates, phosphates, halogens
   (I-2B) Potassium Thiocyanate
   (I-2C) Sodium Dithionite, Sodium Hydrosulfite
3. **(I-3)** Amides, nitrites**, azides**, nitric acid, nitrates **(except ammonium nitrate, isolate it!), cadmium nitrate, Mercuric or Mercurous nitrate, Nickel Nitrate
4. **(I-4A)** Oxides, silicates, carbonates, carbon
   (I-4B) Hydroxides, ammonium hydroxide, Ammonia (liquid), Lye, Potassium Hydroxide,
5. **(I-5)** Sulfides, selenides, phosphides, carbides, nitrides
6. **(I-6A)** Chlorates**, perchlorates**, perchloric acid**, chlorites**, hypochlorites, hydrogen peroxide
   (I-6B) peroxides**, Sodium Peroxide,
7. **(I-7A)** Arsenates, cyanides, cyanates
   (I-7B) Potassium Cyanide
8. **(I-8)** Borates, chromates, manganates, permanganates
9. **(I-9)** Acids (except nitric), perchloric and any other oxo-acid
10. **(I-10A)** Sulfur, arsenic, phosphorus pentoxide**
    (I-10B) phosphorus**(red or white)

ORGANIC

Contains carbon (with some exceptions).

1. **(O-1A)** Acids, Anhydrides, peracids
   (O-1B) Acetic Anhydride
2. **(O-2A)** Alcohols, glycols, amines, amides, imines, imides
   (O-2B) Naphthalene
3. **(O-3A)** Hydrocarbons, esters, aldehydes
   (O-3B) Benzene, Methyl Methacrylate
4. **(O-4)** Ethers**, ketones, ketenes, halogenated hydrocarbons, ethylene oxide
5. **(O-5A)** Epoxy compounds
   (O-5B) isocyanates
6. **(O-6)** Peroxides, hydroperoxides, azides**, Benzoyl Peroxide**
7. **(O-7)** Sulfides, polysulfides, sulfoxides, nitriles
8. **(O-8)** Phenols, cresols

**Potentially unstable chemicals

Suggested Shelf Storage Pattern – Inorganic and Organic

Always use barriers, tubs or separate shelves to separate inorganic from organic and also for individual categories.

General Chemicals (non or less hazardous) Inorganic # 10 Inorganic #2 Inorganic #1 Inorganic #4	Orange or Green color Code Inorganic #7 Inorganic #5 Inorganic #8 Inorganic #6 Miscellaneous Cabinet)	Organic #2 Organic #3 Organic #4 Organic #1 (Store only Mild acids on shelf. All strong Acids should be stored in acid cabinet

Acids – White Use quality acid cabinet. Ventilate if possible. Inorganic #9 (Isolate Nitric Acid)	Inorganic **White striped** should be isolated by using tubs or barriers
Organic #1 (Acetic acid and it's derivatives should be stored in flammable cabinet)	Organic **white striped** should also be isolated

Oxidizers Yellow Inorganic #10 Inorganic #2 Inorganic #3 (Ammonium nitrate needs to be isolated) Inorganic #4	Inorganic #8 Inorganic #6 **Yellow Stripe** Need to be stored using barriers, tubs or separate shelves

Flammable – Red
Used approved flammable cabinet. Ventilate if possible.
Inorganic #1 - #10 and **Red Stripe** Inorganic #1 Use tubs to isolate categories
Organic #1 - #4 & #8 and **Red Stripe** organic #1 & #3 & #8 Use tubs to isolate categories

Poisons Blue Inorganic #10 Inorganic #2 Inorganic #3 Inorganic #1 Inorganic #4	 Inorganic #7 Inorganic #5 Inorganic #8 Inorganic #6	 Organic #2 Organic #3 Organic #4

Bases – White Use a quality corrosives cabinet. Ventilate if possible. Inorganic #2 Inorganic #4	**Bases – White Striped** Inorganic #4 (Isolate using barriers, tubs or separate shelves.)

Budget and laboratory storage room size constraints may make it impossible for you to follow this Chemical Storage Pattern exactly. Adapt these recommendations to your existing room, cabinets, and shelving, but make sure you use appropriate barriers between incompatible chemicals.

STEP 3

Separate acids from bases, and oxidizers from organics/reducing agents.

Acids and bases

Keep all of these: Away from all of these:

Acids	Bases
Nitric	Ammonia
Phosphoric	Ammonium Hydroxide
Hydrochloric	Sodium Hydroxide
Muriatic	Potassium Hydroxide
Sulfuric	Cyanides
Hydrofluoric	Sodium Cyanide
Perchloric	Potassium cyanide
Chromic	Bisodium carbonate

Oxidizers and Organics/Reducing Agents

Keep all of these: Away from all of these: And these:

Oxidizers	Organics	Reducing Agents	
Peroxides	Flammable Solvents	Aluminum	Nickel
Nitrates	Paper	Arsenic	Nitrites
Chromates	Activated Carbon	Boron	Phosphorus
Chromic Acid	Acetylene Gas	Bromine	Platinum
Dichromates	Propane Gas	Cadmium	Silver
Oxygen Gas	Acetic Acid	Carbon	Sodium
Perchlorates	Organic Compounds, ending in:	Chlorine	Sulfur
Perborates	...ane (e.g., Hexane)	Chromium	Tin
Periodates	...ene (e.g., Xylene or Toluene)	Copper	Zinc
Permanganates	...hyde (e.g., Benzaldehyde)	Gold	
Persulfates	...ile (e.g., Acetonitrile)	Hydrazine	
Perchloric Acid	...ol (e.g., Methanol or Phenol)	Iodine	
Nitric Acid	...one (e.g., Acetone or Methyl Ethyl Ketone)	Iron	
		Lead	
		Magnesium	
		Manganese	
		Mercury	

STEP 4

Store all compressed gases separately. Secure gas cylinders to walls or carts.

Laboratory Chemical Storage

Practical Do's and Don'ts

Do's

- Secure shelves to cabinet, walls, and floor. Shelf supports need to be sturdy enough to withstand load of chemicals stored. Install 4" lips on non-porous shelves to contain spills. Close and latch doors on chemical storage cabinets.

- Store chemicals in dedicated cabinets. Store acids in a dedicated acid cabinet. Nitric acid can be stored in cabinet but should be isolated in its own secondary containment. Store both organic and inorganic acids in the acid cabinets. Flammables and poisons should also be stored in dedicated cabinets. Install adequate ventilation/exhaust fan systems in chemistry lab and storeroom.

- Write the date on containers when they arrive to track chemical use. Keep containers clearly labeled and in good condition. Regularly check expiration dates on chemicals.

- Order chemicals in plastic-coated bottles to reduce the risk of breakage.

- Return chemicals to their designated storage location promptly.

- Plug any floor drains in chemical storage areas.

- Prepare your laboratory for earthquakes. Store chemicals in a manner that reduces the risk of breakage and spills.

- Protect drains from spills by installing a bead of silicon caulk around the rim of the drain as a berm.

Don'ts

- Don't use the floor for chemical storage. Do not block aisles with stored chemicals.

- Don't store chemicals above eye level or on top of cabinets.

- Don't purchase chemicals "just in case" you may need them. Purchase on an "as needed" basis only.

- Don't accept donated chemicals. In many cases you will never need or use the chemicals and will end up paying for their disposal. Only chemical exchanges of often-used chemicals can save you money. Never accept chemicals unless they are being used currently.

- Don't store incompatible chemicals together. Keep stored chemicals in closed containers.

- Don't store or hold chemicals in or above sinks or in hoods.

- Don't block escape routes, fire doors or eye wash areas.

- Do not dispose of laboratory glassware in the trash. Have separate containers for trash and broken glass. The glass may be recyclable in your area.

Computerized Laboratory Chemical Inventory System

This section describes how to use a computerized chemical inventory system (included in this manual). You may develop your own or use the disk provided in the back of this guide. You can add or delete chemicals to customize the list to your inventory. The disk provides blank inventory sheets and lists commonly used laboratory chemicals, giving the compatible chemical storage color code, storage hazards, and disposal priority code for each one. The sections of the inventory sheet are explained below:

1. **MSDS-** Put an X if you have a MSDS for that certain chemical. Leave blank if you do not have a MSDS, and must acquire one.

2. **CHEMICAL-** Name of chemical and any synonyms.

3. **COLOR CODING/ LOCATION-** Place the appropriate color and inorganic/organic code for compatible chemical storage of the specific chemical. Also provide location information of chemical (i.e., room #, shelf or cabinet).

4. **INVENTORY NUMBER/AMOUNT-** Place assigned inventory number and amount of chemical stored.

5. **STORAGE HAZARDS-** Input any hazard information about the chemical.

6. **CONTAINER CONDITION-** Rate the condition of the container as poor, fair, or good. Include information such as condition of label, age of bottle, etc.

7. **MANUFACTURER/COST**- List name of manufacturer and cost of product for repurchase knowledge.

8. **COMMENTS/ PRIORITY CODES FOR DISPOSAL-** Use this space to record information you want to note, such as the disposal priority code.

Priority codes are provided to help you decide which chemicals should be disposed first because of their toxicity, hazards, age, container condition, excessive quantity, or if they are outdated. Priority codes could also be helpful in prioritizing disposal of chemicals when budget constraints require disposal be done in phases. The priority codes are listed on the next page.

Disposal Priority Codes For Chemicals Of Concern:

1= Explosive/Shock Sensitive- (Some are always unstable and others become unstable over time or in certain conditions).

2= Carcinogen/Mutagen- Known or probable cancer-causing or gene-altering chemicals.

3 = Highly Toxic- Contact and/or inhalation hazards.

4 = Corrosive- Acids or bases that dissolves metal or glass. Skin irritant.

5 = Reactive- Cyanide or sulfide bearing, or reactive with water/air.

6 = Flammable- Ignitable, with a flashpoint less than 140°F.

Prioritize chemicals for disposal

This is a short list of chemicals of concern which should be prioritized for disposal, due to toxicity and hazards:

Acetyl Chloride
Acrylamide
Ammonium Bichromate
Aniline
Antimony and antimony salts
Arsenic
Azides
Barium Nitrate
Benzene
Bomine
Butyric Acid
Calcium
Calcium Hydride
Carbon Disulfide
Carbon Tetrachloride
Chloral hydrate
Chlorobenzene
Chromates
Chromium and chromium salts
Compressed Gas Cylinders
(small lecture bottles, i.e., Chlorine Gas)
Cyanides
1,2 – Dichloroethane
1,4 - Dioxane
Ethers
Ferrous Oxide
Gun Powder
Hydrofluoric Acid
Lead and lead salts
Mercury and mercury salts
Methyl Bromide
Methylene Chloride
Methyl Ethyl Ketone
Perchloric Acid
Peroxides
Phenol
Phosphorus
Picric Acid
Potassium lump or metal
Silver and silver salts
Sodium
Sodium Azides
Sodium Phosphorous
Tetrahydrofuran
Toluene
Xylene

Sample

Chemical Inventory Sheet, Completed

MSDS	CHEMICAL	COLOR CODING / LOCATION	INVENTORY NUMBER/ AMOUNT	STORAGE HAZARDS	CONTAINER CONDITION	MANUFACTURER AND COSTS	COMMENTS AND CODES FOR DISPOSAL PRIORITY
X	Hydrofluoric acid	White, I-9 acid cabinet	#000004 (1-L)	dissolves glass toxic	poor	Baxter, $/liter	(3, 4) dispose ASAP
	Phosphorus	I-10B, Red flammable	#00001100 g	flammable toxic	good	Baker, cost unknown	(3, 6) store away from oxidizers
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Note:
These tables (pages 37-40) can be used in conjunction with the Chemical Inventory on the following perforated pages. For your convenience, the Chemical Inventory has also been copied onto the diskette located on the inside of the back page.

Chemical Inventory Sheet

MSDS	CHEMICAL	COLOR CODINGL LOCATION	INVENTORY NUMBER/ AMOUNT	STORAGE HAZARDS	CONTAINER CONDITION	MANUFACTURE AND COSTS	COMMENTS AND CODES FOR DISPOSAL PRIORITY

Chemical Inventory Sheet

MSDS	CHEMICAL	COLOR CODING / LOCATION	INVENTORY NUMBER/ AMOUNT	STORAGE HAZARDS	CONTAINER CONDITION	MANUFACTURER AND COSTS	COMMENTS AND CODES FOR DISPOSAL PRIORITY

Chemical Inventory

MSDS	CHEMICAL	COLOR CODING / LOCATION	INVENTORY NUMBER/ AMOUNT	STORAGE HAZARDS	CONTAINER CONDITION	MANUFACTURER AND COSTS	COMMENTS AND CODES FOR DISPOSAL PRIORITY
	Acacia Powder	Organic, Miscellaneous Orange					
	Acetaldehyde	Organic #3, Red Stripe		Oxidizes readily in air to form unstable peroxides, flammable			(2, 3, 4, 6)
	Acetamide	Organic #2, Blue		Health Hazard			(3)
	Acetamide, crystal	Organic #2, Blue		Health Hazard			(3)
	Acetanilide	Organic #2, Orange					
	Acetic Acid	Organic #1, Red		Combustible, above 103ºF, explosive vapor air mixture (fireproof storage), contact haz., corrosive			(1, 4, 6)
	Acetic Anhydride	Organic #1, Red Stripe		Combustible, above 120ºF, explosive potential (fireproof storage), corrosive			(1, 4)
	Aceto Carmine (Natural Red 4)	Miscellaneous, Dye, Orange					
	Aceto-orcein (Orcinol)	Organic, Miscellaneous, Orange					
	Acetone	Organic #4, Red		Highly flammable, vapor air mixture explosive (fireproof, cool storage)			(6)
	Acetonitrile	Organic #5B, Red		Flammable, health hazard			(3, 6)
	Acetophenone	Organic #4, Red		Flammable and health hazard			(3, 6)
	Acetyl Chloride	Organic #1B, Red Stripe		Contact hazard, health hazard, flammable, reactive			(2, 3, 4, 5, 6)
	Acetylcholine (as bromide or chloride)	Organic #3, Orange					
	N-Acetyl-$_L$-cysteine	Organic #1A, Orange					
	Acid Fuchsin	Organic #1A, Orange					

	Acridine Orange	Miscellaneous, Dye Orange					
	Acriflavine Hydrochloride	Organic #2, Blue		Health hazard, contact hazard			(3, 4)
	Acrolein (acrylaldehyde)	Organic #3, Red		Flammable, health hazard			(3, 6)
	Acrylamide	Organic #2A, Yellow stripe		Health hazard, reactive, contact hazard, poison			(2, 3, 4, 5)
	Acrylic Acid	Organic #1A, Red		Contact hazard, flammable			(4, 6)
	Acrylonitrile (Inhibited)	Organic #2, Red		Flammable, explosive (fireproof storage)			(2, 3, 6)
	Adenine	Organic #2, Orange					
	Adrenaline	Organic #2, Orange					
	Agar agar	Organic Misc., Orange		Some Enterococus & Strep agars contain Sodium Azide- see for hazards			(1, 6)
	Agarose, Standard, Low Electroendosmosis (EEO)	Organic #7, Orange					
	DL-Alanine	Organic #2, Orange					
	Albumin, Egg, Powder	Miscellaneous, Orange					
	Albumin, Bovine, Fraction V	Misc., Orange					
	Alcohol, Anhydrous, Reagent	Organic #2A, Red		Flammable, Health hazard			(3, 6)
	ALCONOX	Misc., Orange					
	Alizarin	Organic Misc., Orange					
	Alizarin Red (Red #1)	Miscellaneous, Dye Orange					
	Alum	Inorganic #2, Orange		See aluminum ammonium sulfate, aluminum potassium sulfate			
	Aluminum Ammonium Sulfate	Inorganic #2, Orange					
	Aluminum Acetate, Basic	Inorganic #1, Orange					
	Aluminum Chloride, anhydrous	Inorganic #2, Yellow		Reactive, store separately from bases, reacts violently with water			(3, 5)
	Aluminum Chloride, hydrate	Inorganic #2, Orange					
	Aluminum, DILUT-IT Analytical Concentrate, Standard, 1 g Al^{3+}	Inorganic # 1A, White		Health hazard, contact hazard			(3, 4)
	Aluminum, 10,000 μg/mL (1.00% w/v)	Inorganic #1A, Orange					

	Aluminum, 1000 μg/mL (0.10% w/v)	Inorganic #1A, White		Contact hazard			(4)
	Aluminum Foil (6"x 6" x 0.001")	Inorganic #1a, Orange					
	Aluminum Hydroxide, Powder	Inorganic #4A, Orange					
	Aluminum Hydroxide, Dried Gel, Powder	Inorganic #4A, Orange					
	Aluminum Nitrate,9-Hydrate, Crystal	Inorganic #3, Yellow		Enhances combustion of other materials (avoid contamination), oxidant			(5)
	Aluminum Oxide, Powder	Inorganic #2, Orange					
	Aluminum Oxide, Acid, Powder	Inorganic #4A, Orange					
	Aluminum Oxide, Basic, Powder	Inorganic #4A, Orange					
	Aluminum Oxide, Neutral, Powder	Inorganic #4A, Orange					
	Aluminum Potassium Sulfate, 12-Hydrate, Crystal	Inorganic #2, Orange					
	Aluminum Sodium Sulfate	Inorganic #2, Orange					
	Aluminum Sulfate, 18-Hydrate, Crystal	Inorganic #2, Orange					
	Aluminum sulfate, n-Hydrate, Dried Powder	Inorganic #2A, Orange					
	Aluminum, metal (powder)	Inorganic #1, Red		Flammable			(3, 6)
	Amines	Organic #2A, Red		Many are flammable and corrosive			(3, 4, 6)
	4-Aminoantipyrine	Organic #2A, Orange					
	p-Aminobenzoic Acid	Organic #3A, Orange					
	2-Amino-2-(hydroxymethyl)-1,3-propanediol	Organic #3A, Orange					
	2-Amino-2-methyl-1,3-propanediol	Organic #3A, Orange					
	2-Amino-2-methyl-1-propanol	Organic #3B, Red		Flammable			(6)
	Ammonia, liquid	Inorg. #4 White stripe		Health hazard, corrosive			(3, 4)
	Ammonium Acetate	Inorganic #2, Orange					
	Ammonium Bicarbonate	Inorganic #4, Orange					
	Ammonium Bichromate	Inorganic #8, Yellow		Many reactions may cause fire and explosion (fireproof storage)			(3, 4, 5)

	Ammonium Bifluoride	Inorganic 3B, White		Contact hazard, Health hazard			(3, 4)
	Ammonium Bromide	Inorganic #2, Orange					
	Ammonium Carbonate	Inorganic #4, Orange					
	Ammonium Chloride	Inorganic #2, Orange					
	Ammonium Chromate	Inorganic #8, Blue		Health Hazard			(2, 3)
	Ammonium Citrate	Inorganic #8, Orange					
	Ammonium Dichromate	Inorganic #8, Yellow		See Ammonium Bichromate			(3, 4, 5)
	Ammonium Fluoride, Crystal	Inorganic #3B, Blue		Health Hazard			(3)
	Ammonium Hydroxide, DILUT-IT Analytical Concentrate, N/10 (0.1N)	Inorganic #4, White stripe		Contact and Health Hazard, corrosive			(3, 4)
	Ammonium Hydroxide, 28.0-30.0%	Inorganic #4, White Stripe		Health Hazard, Contact Hazard			(3, 4)
	Ammonium Hydroxide, 5N Volumetric Solution	Inorganic #4, White Stripe		Health Hazard, Contact Hazard			(3, 4)
	Ammonium Iodide	Inorganic #2, Orange					
	Ammonium Metavanadate	Inorganic #2, Blue		Health hazard			(3)
	Ammonium Molybdate	Inorganic #8, Orange		Health Hazard			(3)
	Ammonium Nitrate	Yellow, store separately		Enhances combustion of other substances, strong oxidant (fireproof storage), reactive			(3, 4)
	Ammonium Orange	Inorganic #2, Orange					(3, 4)
	Ammonium Oxalate	Inorganic #2, White		Health and contact hazard			(3, 4)
	Ammonium Persulfate	Inorganic #6, Yellow		Enhances combustion of other substances; explosive reaction with reducing agents, metals, reactive			(1, 3, 5)
	Ammonium Phosphate, Monobasic	Inorganic #2, Orange					
	Ammonium Phosphate, Dibasic, crystal	Inorganic #2A, Orange					
	Ammonium 1-Pyrrolidine-carbodithioate	Orange					

	Ammonium Sulfamate	Inorganic #2A, Orange					
	Ammonium Sulfate	Inorganic #2, Orange					
	Ammonium Sulfide	Inorganic #5, Red		Flammable			(6)
	Ammonium Sulfite	Inorganic #2, Orange					
	Ammonium Tartrate	Inorganic #2, Orange					
	Ammonium Thiocyanate, Crystal	Inorganic #7, Orange					
	Ammonium Thiocyanate, 0.1N Volumetric Solution	Inorganic # 7, Orange					
	Ammonium Thiocyanate, DILUT-IT, Analytical Concentrate, N/10, (0.1N)	Inorganic #7, Orange					
	Ammonium meta-Vanadate	Inorganic #6, Blue		Health Hazard			(3)
	Amyl Acetate	Organic #3, Red		Flammable, explosive when mixed with air (fireproof storage)			(6)
	Amyl Alcohol	Organic #2, Red		Contact Hazard, flammable			(4, 6)
	iso-Amyl Alcohol	Organic #2, Red		Flammable			(6)
	tert-Amyl Alcohol	Organic #2, Red		Flammable			(6)
	Anhydrous Ether	Organic #4, Red		Explosive and flammable			(1, 6)
	Aniline (or any of its salts)	Organic #2, Red		Combustible; above 160ºF, explosive air vapor mixtures (fireproof storage, away from acids, oxidants)contact/health haz.			(2, 3, 4, 6)
	Aniline Blue WS	Miscellaneous, Dye Orange					
	Aniline Hydrochloride	Organic #2, Orange					
	Aniline Violet	Miscellaneous, Dye Orange					
	Anisole	Organic #4, Red		Flammable			(6)
	Anthracene	Organic #3, Orange					
	Anthrone	Orange					
	Antifoam B Silicone Emulsion	Misc., Orange					
	Antimony	Inorganic #1, Blue		Flammable as dust, health hazard			(2, 3, 6)
	Antimony, Lump	Inorganic #1, Blue		Health hazard			(3)

	Antimony, 10,000 μg/mL (1.00% w/v	Inorganic #1, Orange					
	Antimony, 1,000 μg/mL (0.10% w/v)	Inorganic #1, Orange					
	Antimony Oxide (Trioxide)	Inorganic #4, Blue		Health and contact hazard			(2, 3, 4)
	Antimony Pentachloride	Inorganic #2, White		Health and contact hazard			(2, 3, 4)
	Antimony Potassium Tartrate, Trihydrate, Powder	Inorganic #2, White		Health and contact hazard			(2, 3, 4)
	Antimony Trichloride, Crystal	Inorganic #2, White		Health and contact hazard			(2, 3, 4)
	Antimony Trisulfide	Inorganic #5, Blue		May enhance combustion of other substances, Health hazard			(2, 3)
	L-(+)-Arabinose	Organic #2, Orange		Health hazard			(2, 3)
	L-(+)-Arginine Monohydrochloride	Organic misc., Orange					
	Arsenic, 10,000 μg/mL (1.00% w/v)	Inorganic #1A, Orange		Health hazard			(3)
	Arsenic, 1,000 μg/mL (0.10% w/v)	Inorganic, #1A, White		Health hazard			(3)
	Arsenic and its salts	Inorganic #10, Blue		Health hazard			(2, 3)
	Arsenic Chloride (Trichloride)	Inorganic #10, Blue		Health hazard			(2, 3)
	Arsenic Pentoxide	Inorganic #10, Blue		Health hazard			(2, 3)
	Arsenic Powder	Inorganic #10, Blue		Health hazard			(2, 3)
	Arsenic Trichloride	Inorganic #10, Blue		Health and contact hazard			(2, 3, 4)
	Arsenic Trioxide Arsenous Acid)	Inorganic #7, Blue		Health hazard			(2, 3)
	ASCARITE II (Coarse) (8-20 Mesh)	Inorganic #4A, White stripe		Contact and health hazard			(3, 4)
	Asbestos (fiberous)	Inorganic #4, Blue		Health hazard			(2, 3)
	L-(+)-Ascorbic Acid, Powder	Organic #1, Orange					
	L-(+)-Asparagine Monohydrate	Organic misc., Orange					
	DL-Aspartic Acid	Organic misc., Orange					
	Aspirin, Powder	Organic misc., Orange					
	Atropine Sulfate	Blue		Health hazard			(3)
	Auramine O	Organic #2A, Blue		Health hazard			(3)

	Aurintricarboxylic Acid, Triammonium Salt	Organic #!A, Orange		Health hazard			(3)
	Azure II	Misc., Orange					
	'Baker-flex', Aluminum Oxide IB	Inorganic #4A, Orange					
	'Baker-flex', Cellulose	Misc., Orange					
	'Baker-flex', Polyamide 6	Misc., Orange					
	'Baker-flex', Silica Gel IB	Misc., Orange					
	Balsam	Organic #2, Orange					
	Barford Reagent	Organic #1, Orange		Contains cupric acetate, acetic acid and water			(4)
	Barium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Orange		Health hazard			(3)
	Barium, 1,000 μg/mL (0.10% w/v)	Inorganic #1`, White		Contact hazard			(4)
	Barium Acetate	Inorganic #2, Blue		Health hazard			(3)
	Barium and its salts	Inorganic #2, Blue		Health and contact hazard			(3, 4)
	Barium Carbonate	Inorganic #4, Orange					
	Barium Chlorate	Inorganic #6, Yellow		Reactive			(5)
	Barium Chloride, Dihydrate, Crystal	Inorganic #2, Blue		Health hazard			(3)
	Barium Chloride, Anhydrous, Powder	Inorganic #2, Blue		Health hazard			(3)
	Barium Dioxide, Powder	Inorganic #4A, Yellow		Health and reactivity hazard			(3, 5)
	Barium Diphenylamine-sulfonate	Inorganic # 2A, Blue		Health hazard			(3)
	Barium Hydroxide	Inorganic #4, Blue		Health hazard			(3)
	Barium Nitrate	Inorganic #3, Yellow		Enhances combustion of other substances; explosive, oxidant			(1, 3, 5)
	Barium Oxalate	Inorganic #2, Blue		Health hazard			(3)
	Barium Oxide	Inorganic #4, Blue		Oxidant			(3, 4)
	Barium Peroxide	Inorganic #6, Yellow		Enhances the combustion of other substances; many reactions cause fire or explosion			(1, 5)
	Barium Sulfate	Inorganic #2, Orange					

	Barium Sulfide	Inorganic #5, Blue		Health hazard			(3)
	Basic Fuchsin Hydrochloride	Organic #4, Blue		Health hazard			(3)
	Bathophenanthroline	Organic , Orange					
	Beal Orcinol Reagent	Organic #2, Red		Contains resorcinol, ethyl alcohol, and ferric chloride, flammable			(6)
	Beeswax	Miscellaneous, Orange					
	Benedict's Solution	Inorganic #2, Orange					
	Benzaldehyde	Organic #3, Red		Combustible; above 145ºF, explosive air vapor mixtures (fireproof storage)			(6)
	Benzene	Organic #3, Red stripe		Highly flammable (fireproof storage), health hazard			(2, 3, 6)
	Benzenesulfonyl Chloride	Inorganic #2A, White		Contact hazard			(4)
	Benzidine	Organic #2, Blue		Health Hazard, carcinogen			(2, 3)
	Benzocaine, Fine Powder	Organic #3A, Orange					
	Benzoic Acid	Organic #1, Orange					
	Benzoin anti-Oxime	Organic #3A, Orange					
	Benzonitrile	Organic #3B, Red		Flammable			(6)
	Benzophenone	Organic #3B, Red		Flammable			(6)
	Benzotriazole	Organic #3A, Orange					
	Benzoyl Chloride	Organic #1B, Red stripe		Contact and health hazard, flammable			(3, 4, 6)
	Benzoyl Peroxide	Organic #6, Red stripe		Contamination or heating can cause violent decomposition, reactive, flammable, contact hazard			(1, 2, 3, 5, 6)
	Benzyl Alcohol	Organic #2A, Orange					
	Benzylamine	Organic #2A, White		Contact hazard			(4)
	Benzyl Chloride, Stabilized	Organic #1, Red		Contact hazard, flammable			(4, 6)
	Benzyltrimethylammonium Chloride, (60% in H_2O)	Organic #1, Orange					
	Beryllium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Orange		Health hazard			(3)
	Beryllium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)

	Beryllium Carbonate	Inorganic #4, Blue		Health hazard			(2, 3)
	Beryllium Sulfate, 4-Hydrate, (99.9%)	Inorganic #2A, Blue		Health hazard			(3)
	Biebrich Scarlet, Water Soluble	Organic misc., Orange					
	D-Biotin	Organic misc., Orange					
	Biphenyl	Organic #3A, Blue		Health hazard			(3)
	Biphenyl (Diphenyl)	Organic #3, Red		Flammable, Health hazard			(3, 6)
	2,2'-Bipyridine	Organic , Orange					
	Bis(2-ethylhexyl) Phosphate	Organic, Orange					
	Bis(2-methoxyethyl) Ether	Organic #4, Red		Flammable			(6)
	Bismuth	Inorganic #1, Orange					
	Bismuth, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Bismuth, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Bismuth Nitrate	Inorganic #3, Yellow		Oxidant, Reactive			(5)
	Bismuth subcarbonate, Powder	Inorganic 4A, Orange					
	Bismuth Subgallate	Orange					
	Bismuth Subnitrate, Powder	Inorganic #3, Yellow		Reactive			(5)
	Bismuth Trichloride	Inorganic #2, Blue		Health and contact hazard			(3, 4)
	Bismuth Trioxide, Powder	Inorganic #4A, Orange					
	Boric Acid	Inorganic #9, Orange					
	Boric Anhydride, Powder	Inorganic #4A, Blue		Contact hazard			(4)
	Boron, 10,000 μg/mL (1.00% w/v)	Inorganic #4B, White Stripe		Contact hazard			(4)
	Boron, 1,000 μg/mL (0.10% w/v)	Inorganic #4A, Orange					
	Bouin's Fluid or Solution	Organic #1, White		Saturated picric acid solution, formalin and acetic acid			(4)
	Brilliant Green	Organic #3, Dye, Orange					
	Bromine (Bromide-Bromate), DILUT-IT Analytical Concentrate, N/10 (0.1N)	Inorganic #2A, Orange					

	Bromine (Bromide-Bromate), 0.1N Volumetric Solution	Inorganic #2A, Orange					
	Bromine	Inorganic #2, Yellow Stripe		Many reactions may cause fire and explosion; oxidant, reactive and Health hazard			(1, 3, 4, 5, 6)
	Bromine Water	Inorganic #2, Yellow Stripe		Oxidant, Reactive and Health hazard			(1, 3, 4, 5, 6)
	p-Bromoaniline	Organic , Blue		Health and contact hazard			(4)
	mono-Bromobenzene	Organic #3B, Red		Flammable			(6)
	1-Bromobutane	Organic #3B, Red		Flammable			(6)
	2-Bromobutane	Organic #3B, Red		Flammable			(6)
	Bromocresol Green	Miscellaneous, Dye, Orange					
	Bromocresol Green, Sodium Salt	Misc., Dye, Orange					
	Bromocresol Purple	Miscellaneous, Dye, Orange					
	Bromoform	Organic #4, Blue		Health hazard			(3)
	1-Bromonaphthalene	Organic #4, Orange					
	Bromophenol Blue	Miscellaneous, Dye, Orange					
	Bromophenol Blue, sodium Salt	Misc., Dye, Orange					
	1-Bromopropane	Organic #4, Red		Flammable			(6)
	2-Bromopropane	Organic #4, Red		Flammable			(6)
	3-Bromopropene	Organic #4, Red		Health and Flammability hazard			(3, 6)
	N-Bromosuccinimide	Organic #4, Orange					
	Bromothymol Blue	Miscellaneous, Dye, Orange					
	Bromothymol Blue Solution	Misc., Dye, Orange					
	Bromothymol Blue, Sodium Salt	Misc., Dye, Orange					
	Brucine	Organic, Blue		Health hazard			(3)
	Brucine Sulfate, 7-Hydrate	Organic, Blue		Flammable			(6)
	Buffer Concentrate (Biphthalate), pH 4, DILUT-IT	Misc., Orange					
	Buffer Solution (Biphthalate), pH4	Misc., Orange					

	Buffer Solution (Biphthalate), pH 4 (Color) Coded Red)	Misc., Orange					
	Buffer Concentrate (Phosphate) pH 7, DILUT-IT	Misc., Orange					
	Buffer Solution (Phosphate), pH 7	Misc., Orange					
	Buffer Solution (Phosphate), pH 7 (Color Coded Yellow)	Misc., Orange					
	Buffer Concentrate (Carbonate), pH 10, DILUT-IT	Misc., Orange					
	Buffer Solution (Borate), pH 10	Misc., Orange					
	Buffer Solution (Borate), pH 10 (Color Coded Blue)	Misc., Orange					
	1,4-Butanediol	Organic #2A, Orange					
	Butanol (n-Butyl Alcohol)	Organic #2, Red		Flammable, explosive when mixed with air (fireproof storage)			(6)
	1-Butanol	Organic #2, Red		Flammable			(6)
	2-Butoxyethanol	Organic #4, Red		Contact hazard, flammable			(4, 6)
	2-(2-Butoxyethoxy)ethanol	Organic #2, Orange					
	2-(2-Butoxyethoxy)ethyl Acetate	Organic #2, Orange					
	2-Butoxyethyl Acetate	Organic #4, Red		Flammable			(6)
	Butyl Acetate	Organic #2A, Red		Flammable			(6)
	tert-Butyl Alcohol	Organic #2A, Red		Flammable			(6)
	Butylamine	Organic #2A, Red		Flammable and contact hazard			(4, 6)
	2,2'-(Butylimino)diethanol	Organic #2A, Orange					
	tert-Butyl Methyl Ether	Organic #4, Red		Flammability and health hazard			(3, 6)
	Butylparaben	Organic #, Orange					
	Butyl Sulfide	Organic #7, Red					
	Butyric Acid	Organic #1, Red		Explosive in above 161ºF, air vapor mixtures (fireproof storage), contact hazard			(1, 4, 6)
	Butyric Acid, Sodium salt	Organic #1, Orange					

	Cacodylic Acid, Sodium Salt, Trihydrate	Blue		Health hazard			(3)
	Cadmium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Orange		Health hazard			(3)
	Cadmium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Cadmium Acetate	Inorganic #2, Blue		Health and contact hazard			(2, 3, 4)
	Cadmium	Inorganic #1, Blue		Health hazard			(2, 3)
	Cadmium Carbonate	Inorganic #4, Blue		Health hazard			(2, 3)
	Cadmium Chloride, 2.5-Hydrate, Crystal	Inorganic #2, Blue		Health and contact hazard			(2, 3, 4)
	Cadmium Chloride, Anhydrous, Powder	Inorganic #2, Blue		Health and contact hazard			(3, 4)
	Cadmium Iodide, Crystal	Inorganic Blue		Health and contact hazard			(3, 4)
	Cadmium Nitrate, 4-Hydrate	Inorganic #3, Yellow stripe		Oxidant, Health and contact hazard, reactive			(2, 3, 4, 5)
	Cadmium Oxide	Inorganic #4, Blue		Health and contact hazard			(2, 3, 4)
	Cadmium Powder	Inorganic #4, Blue		Health hazard			(2, 3)
	Cadmium Sulfate, Hydrate, Crystal	Inorganic #2, Blue		Health an contact hazard			(2, 3, 4)
	Cadmium Sulfate, Anhydrous, Powder	Inorganic #2, Blue		Health and contact hazard			(3, 4)
	Cadmium, metal	Inorganic #1, Blue		Health hazard			(2, 3)
	Caffeine	Organic ,Orange					
	Caffeine, Citrated	Organic, Orange					
	Calamine	Inorganic #4A, Orange					
	Calcium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Many reactions may cause fire or explosion and health hazard			(2, 3, 6)
	Calcium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Calcium, DILUT-IT Analytical Concentrate, Standard, 1 g Ca^{2+}	Inorganic #1, White		Contact hazard			(4)
	Calcium, Turnings	Inorganic #1, Red					

	Calcium Acetate	Inorganic #2, Orange					
	Calcium Bromide	Inorganic #2, Orange					
	Calcium Carbide	Inorganic #5, Red Stripe		Reaction with water may cause fire and explosion			(4, 5, 6)
	Calcium Carbonate	Inorganic #4, Orange					
	Calcium Chloride, Dihydrate, Granular	Inorganic #2, Orange					
	Calcium Chloride, Anhydrous	Inorganic #2A, Orange					
	Calcium Dioxide (Peroxide)	Inorganic #4, Yellow		Oxidant, Corrosive base			(1, 4)
	Calcium Fluoride	Inorganic #2, Orange					
	Calcium Gluconate, Powder, Anhydrous	Inorganic #4A, Orange					
	Calcium Hydride (94%)	Inorganic #1B, Red Stripe		Flammability, reactive and contact hazard			(4, 5, 6)
	Calcium Hydroxide	Inorganic #4, Orange					
	Calcium Hypochlorite	Inorganic #6, Yellow		Enhances combustion of other substances; oxidant (reactive)			(5)
	Calcium Lactate, 5-Hydrate	Organic #1A, Orange					
	Calcium Nitrate	Inorganic #3, Yellow		Enhances combustion of other substances, oxidant (reactive)			(5)
	Calcium Oxide	Inorganic #4, Orange		water reactive, caustic			(4, 5)
	Calcium Pantothenate	Organic #1A, Orange					
	Calcium Phosphate	Inorganic #2, Orange					
	Calcium Sulfate	Inorganic #2, Orange		Health and contact hazard			(3, 4)
	Calcon, Powder	Organic #7, Orange					
	Calmagite	Organic #7, Orange					
	Calomel	Inorganic #2A, Blue		Health and contact hazard			(3, 4)
	Camphor	Organic #4, Red		Combustible above 150ºF, explosive vapor air mixtures, health hazard			(3, 6)
	Carbol Fuchsin (Ziehl's Stain)	Organic #2, White		Health and contact hazard			(3, 4)
	Carbolic Acid (Phenol)	Organic #8, Blue		Health hazard			(3)
	Carbon	Inorganic #10, Red					

	Carbon Dioxide	Miscellaneous		Solid can cause frostbite			(4)
	Carbon Disulfide	Organic #7, Red		Highly flammable, ignites by friction, explosive when mixed with air (fireproof storage under water or inert gas), explosive limits 1-50%, health and contact hazard			(1, 3, 4, 6)
	Carbon Tetrachloride (CFC-10)	Organic #4, Blue		Health and contact hazard			(2, 3, 4)
	Carborundum	Inorganic #4, Blue					
	[[(Carboxymethyl)imino]-bis(ethylenenitrilo)]tetra-acetic Acid	Organic #1, Orange					
	Carmine	Miscellaneous, Dye, Orange					
	Carnoy Fixative (mixture of alcohol, acetic acid & chloroform)	Organic #2, Red		Flammable			(6)
	Casein	Miscellaneous, Orange					
	Castor Oil	Organic Misc., Orange					
	Catechol (1,2-dihydroxybenzene)	Organic #8, Red		Combustible			(4, 6)
	Catechol (pyrocatechol)	Organic #8, Red		Combustible			(4, 6)
	Cedarwood Oil, For Immersion	Organic misc., Orange					
	Celite 545	Organic Misc., Orange					
	Celite 503	Organic misc., Orange					
	Cellobiose	Organic misc., Orange					
	Cellulose, (Acid Washed, Ashless)	Organic , Red					
	Cellulose DEAE	Organic, Red					
	Ceric Ammonium Nitrate, Crystal	inorganic #3B, Yellow		Reactivity hazard			(5)
	Ceric Ammonium Sulfate, Dihydrate, Crystal	Inorganic #2A, Orange					
	Ceric Sulfate	Inorganic #2A, Yellow Stripe		Fire risk in presence of organic substances, Reactive, Contact hazard			(5)
	Cesium sulfate	Inorganic #2A, Orange					

	Charcoal	Inorganic #10, Red		Flammable			(6)
	Chloral Hydrate	Controlled Substance Blue		Should not be stored on school premises			(3) dispose !!!
	α-Chloralose	Organic #3A, Orange					
	Chloramine-T, Trihydrate	Organic #2A, Blue		Health hazard			(3)
	Chloretone (Chlorobutanol)	Organic #2, Blue		Health hazard			(3)
	Chloride, DILUT-IT Analytical Concentrate, Standard, 1g Cl^-	Inorganic #2A, Orange					
	Chlorine	Bottled gas, Yellow		Many reactions may cause fire and explosion			(1, 3, 4, 5)
	Chloroacetic Acid, Sodium Salt	Organic #1, Orange					
	Chlorobenzene	Organic #4, Red		Combustible; above 84°F, explosive vapor air mixtures (fireproof storage)			(3, 6)
	1-Chlorobutane	Organic #4A, Red		Flammability hazard			(6)
	2-Chlorobutane	Organic #4A, Red		Flammability hazard			(6)
	Chloroform	Organic #4, Blue		Health hazard			(2, 3)
	2-Chloro-2-methylpropane	Organic #4A, Red		Flammable			(6)
	m-Chloroperbenzoic Acid	Organic #4A, Yellow		Reactivity hazard			(5)
	Chlorophenol	Organic #8, Blue		Health Hazard			(3)
	ChloroplatinicAcid, 6-Hydrate, Crystal	Organic #1, White		Health and contact hazard			(3, 4)
	Chlorosulfonic Acid	Organic #1, White Stripe		Health, Reactivity and contact hazard			(3, 4, 5)
	Cholesterol	Organic misc., Orange					
	Choline Chloride	Orange					
	Chorionic Gonadatropin	Miscellaneous, Orange					
	Chromic Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Chromium, DILUT-IT Analytical Concentrate, Standard, 1j Cr^{6+}	Inorganic #1, White		Health and contact hazard			(3, 4)
	Chromium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Orange		Health and contact hazard, reactive			(2, 3, 4, 5)
	Chromium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, Blue		Health and contact hazard			(2, 3)
	Chromium Pellets	Inorganic #1, Orange		Health and contact hazard			(2, 3)

	Chromium (III) Potassium Sulfate	Inorganic #2, Orange					
	Chromium (VI) Oxide	Inorganic #4, Blue		Oxidant, Reactive, Health hazard			(2, 3, 5)
	Chromium Acetate	Inorganic #2, Blue		Health hazard			(2, 3)
	Chromium Chloride	Inorganic #2, Orange					
	Chromium Nitrate	Inorganic #3, Yellow		Strong Oxidant, reactive			(2, 3, 5)
	Chromium Oxide, Powder	Inorganic #1A, Blue					
	Chromium Potassium Sulfate, 12-Hydrate, Crystal	Inorganic #2A, Orange					
	Chromium Powder	Inorganic #1, Blue		Health hazard			(2, 3)
	Chromium Sulfate, n-Hydrate, Crystal	Inorganic #2A, Orange					
	Chromium Trioxide	Inorganic #4, Yellow		Many reactions may cause fire and explosion; strong oxidant, Health and contact hazard			(2, 3, 5, 6)
	trans-Cinnamaldehyde	Organic #3A, Orange					
	Citric Acid, Monohydrate, Granular	Organic #1, Orange					
	Citric Acid, Anhydrous, Powder	Organic #1, Orange					
	Cleland's Reagent	Organic, Orange					
	Cobalt, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Cobalt, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Cobalt Acetate, 4-Hydrate, Crystal	Organic , Orange					
	Cobalt Carbonate, Powder	Inorganic #2A, Orange					
	Cobalt Chloride	Inorganic #2, Blue		Health hazard			(2,3)
	Cobalt Nitrate	Inorganic #3, Yellow		Enhances the combustion of other substances; oxidant, Health hazard			(2,3)
	Cobalt Oxide, Powder	Inorganic 4A, Orange					
	Cobalt Powder	Inorganic #1, Red		Spontaneously combustible. Health hazard.			(3, 6)
	Cobalt Sulfate	Inorganic #2, Orange					

	Colchicine	Organic #8, Blue		Health hazard			(2, 3)
	Collodion, Flexible	Organic #4, Red		Flammable			(6)
	COOMASSIE Brilliant Blue R-250	Misc., Dye, Orange					
	Congo Red	Misc., Dye, Blue		Health hazard			(3)
	Copper, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Copper, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Copper, DILUT-IT Analytical Concentrate, Standard, 1 g Cu^{2+}	Inorganic #1, White		Contact hazard			(4)
	Copper, Powder	Inorganic #1, Red Stripe		Flammability			(3)
	Creatine, Monohydrate	Organic #1, Orange					
	Creatinine	Organic #1, Orange					
	m-Cresol	Organic #8, Red		Contact hazard			(4)
	p-Cresol	Organic #8, Red		Contact hazard			(4)
	m-Cresol Purple	Misc., Dye, Orange					
	Crystal Violet	Misc., Dye, Orange					
	Cumene	Organic #3B, Red					
	Cupferron, Crystal	Organic #2A, Blue		Health hazard			(3)
	Cupric Acetate	Inorganic #2, Orange					
	Cupric Bromide	Inorganic #2, Orange		Contact hazard			(4)
	Cupric Carbonate	Inorganic #4, Orange		Contact hazard			(4)
	Cupric Chloride	Inorganic #2, Orange		Contact hazard			(4)
	Cupric Nitrate	Inorganic #3, Yellow		Strong oxidant, reactive, Contact hazard			(4, 5)
	Cupric Oxide	Inorganic #4, Orange					
	Cupric Sulfate	Inorganic #2, Orange					
	Cuprous Cyanide, Powder	Inorganic #7A, Blue		Health and contact hazard			(3, 4)
	Curcumin, Crystalline	Misc., Dye, Orange					
	Cyanogen Bromide	Inorganic #2A, White Stripe		Health, reactivity and contact hazard			(3, 4, 5)
	Cyclohexane	Organic #3B, Red		Flammability hazard			(6)
	Cyclohexanol	Organic #8, Red					
	Cyclohexanone	Organic #4, Red					

	Cyclohexene	Organic #3, Red		Highly flammable (fireproof storage, add inhibitor) and contact hazard			(6)
	Cyclohexylamine	Organic #2A, Red		Flammability and contact hazard			(4, 6)
	Cyclopentane	Organic #3B, Red		Flammability			(6)
	Cyclopentanone	Organic #4, Red		Flammability			(6)
	L-(+)-Cysteine	Organic #1,Orange					
	L-(+)-Cysteine Hydrochloride, Monohydrate	Organic #1, Orange					
	L-(--)-Cystine	Organic #1, Orange					
	Decahydronaphthalene	Organic, Red					
	Decane	Organic, Red					
	1-Decanol	Organic, Red					
	DECARBITE	Inorganic, White Stripe		Contact and Health hazard			(3, 4)
	Deoxyribonucleic Acid	Organic #1, Orange					
	DESICCHLORA	Inorganic, Yellow		Reactive			(5)
	Devarda's Alloy, Granular	Inorganic #1, Orange					
	Dextran	Organic, Orange					
	Dextrin Starch	Miscellaneous, Orange					
	Dextrose	Miscellaneous, Orange					
	Diacetyl Monoxime	Organic, Orange					
	3,3'-Diaminobenzidine Hydrochloride, Powder	Organic #3A, Blue		Health hazard			(3)
	Diatomaceous Earth	Inorganic #4A, Orange					
	Diastase of Malt	Miscellaneous, Orange					
	Dibutylamine	Organic #2A, Red		Contact hazard			(4)
	Dibutyl Phthalate	Organic Misc., Orange					
	Dichloroacetic Acid	Organic #1, White		Contact hazard			(4)
	Dichlorobenzene	Organic #4, Red		Contact and health hazard, flammable			(6)
	1,2-Dichloroethane (Ethylene Dichloride)	Organic #4, Red		Health hazard, flammable			(2, 3, 6)
	2,6-Dichloroindophenol Sodium Derivative	Organic #8, Orange					

	Dichloromethane (Methylene Chloride)	Organic #4, Blue		Health hazard			(2, 3)
	Dichlorophenol	Organic #8, Blue					
	Diethanolamine	Organic #2A, Orange					
	Diethylamine	Organic #2A, Red		Flammability hazard			(6)
	Diethylenetriamine	Organic 32A, Blue		Health and contact hazard			(3, 4)
	Diethyl Ether	Organic #4, Red		Explosive when mixed with air and flammable, peroxidizable			(1, 6)
	Diethyl Malonate	Organic, Blue		Health hazard			(3)
	Diethyl Oxalate	Organic, Red					
	Diethyl Phthalate	Organic #4, Orange					
	Digitonin	Organic #3, Orange					
	Diiodomethane	Organic#3, Orange					
	Diisopropyl Ether	Organic #4, Red		Explosive when mixed with air, peroxidizable			(1)
	1,2-Dimethoxyethane	Organic #3, Red					
	N,N-Dimethylacetamide	Organic #2A, Red		Health and Contact hazard			(3, 4)
	p-(Dimethylamino)benz-aldehyde	Organic #3, Orange					
	5-[p(Dimethylamino)benzy-lidene]rhodanine	Organic #3A, Orange					
	N,N-Dimethylaniline	Organic #2, Red		Contact hazard			(4)
	N,N-Dimethylbenzylamine (99%)	Organic #2, Red		Contact hazard			(4)
	Dimethyl Formamide	Organic # 2, Red		Health and contact hazard, flammable			(3, 4, 6)
	Dimethylglyoxime	Organic #2, Orange					
	2,6-Dimethyl-4-heptanone	Organic #4, Red					
	N,N-Dimethyl-1-naphthylamine	Organic #2, Orange					
	2,9-Dimethyl-1,10-phenanthroline Dihydrate	Organic, Orange					
	2,9-Dimethyl-1,10-phenanthroline Monohydrochloride	Organic #8,, White		Contact hazard			(4)
	N,N-Dimethyl-p-phenylenediamine Monohydrochloride	Organic #8, Blue		Health hazard			(3)

	N,N-Dimethyl-p-phenylenediamine Oxalate	Organic #8, Blue		Health hazard			(3)
	Dimethyl Phthalate	Organic #3, Orange					
	Dimethyl Sulfoxide	Organic #7, Red					
	Dimethyl d_6 Sulfoxide	Organic #7, Red					
	N,N-Dimethyl-p-toluidine	Organic #3, Orange					
	2,4-Dinitrophenylhydrazine	Organic #8, Orange					
	Dinitrotoluene	Inorganic #3, Red		Health hazard, flammable			(2, 3, 6)
	Dioxane (Diethylene Ether)	Organic #4, Red		Health and contact hazard, flammable, peroxidizable			(1, 2, 3, 6)
	1, 4-Dioxane (p-Dioxane)	Organic #4, Red		Flammable; may develop explosive peroxides (fireproof storage)			(1, 6)
	Diphenylamine	Organic #2, Orange					
	'sym-Diphenylcarbazone'	Organic, Orange					
	1,5-Diphenylcarbohydrazide, Powder	Organic #6, Orange					
	Diphenylhydrazine	Organic #2A, Blue		Health hazard			(3)
	1,3-Diphenyl-1,3-propane-dione	Organic, Orange					
	Dipotassium Chromate	Inorganic #8, Yellow		Oxidant, reactive			(5)
	Disodium Hexafluorosilicate (Sodium Silicofluoride)	Inorganic #1A, Orange					
	Dithizone, Crystal	Organic #3, Orange					
	Dodecane	Organic #, Red					
	1-Dodecanol	Organic #2, Orange					
	Drierite, Regular (8 Mesh)	Inorganic, Orange					
	Drierite, Indicating (4 Mesh)	Inorganic, Blue		Health hazard			(3)
	Edetate Disodium	Organic #1, Orange					
	EDTA Standard Solution	Organic #1, Orange					
	EDTA, Powder	Organic #1, Orange					
	EDTA, Dipotassium Salt, Dihydrate	Organic #1, Orange					
	EDTA, Disodium Salt	Organic #1, Orange					
	EDTA, Iron(III) derivative	Organic, Orange					

	EDTA, Magnesium Derivative	Organic, Orange					
	EDTA, Tetrasodium Salt	Organic #1, Orange					
	Eosin	Miscellaneous, Orange					
	Ephedrine Hydrochloride	Organic , Orange					
	Ephedrine Sulfate	Organic #7, Orange					
	Epichlorohydrin	Organic #4, Red		Health, flammability and contact hazard			(3, 4, 6)
	Epinephrine	Organic #2, Orange		See Adrenaline			
	Epsom Salt	Inorganic #2, Orange		See magnesium sulfate			
	Erichrome Black T, Powder	Misc., Dye, Orange					
	Erythritol	Organic, Orange					
	Erythrosine	Miscellaneous, Dye, Orange					
	Ethanethiol	Organic #3A, Red		Flammable			(6)
	Ether	Organic #4, Red		Highly flammable, explosive when mixed with air, forms peroxides, fireproof storage			(6)
	Ether, Ethyl	Organic #4, Red		Highly flammable, explosive when mixed with air, forms peroxides, fireproof storage			(1, 6)
	Ethidium Bromide	Organic #4, Orange					
	2-Ethoxyethanol	Organic #2A, Red		Health and contact hazard			(3, 4)
	2-Ethoxyethyl Acetate	Organic #4, Red		Health and contact hazard			(3, 4)
	Ethyl Acetate	Organic #4, Red		Flammable, explosive when mixed with air (fireproof storage)			(1, 6)
	Ethyl Acetoacetate	Organic #4, Red					
	Ethyl Alcohol	Organic #2, Red		Flammable			(6)
	Ethyl Methacrylate	Organic #3, Red		Flammable			(4, 6)
	Ethylamine	Organic #2, Red					
	Ethylbenzene	Organic #3 , Red		Flammable, Health hazard			(2, 3, 6)
	Ethyl Benzoate	Organic #1, Orange					
	Ethyl Bromoacetate	Organic #4, Red		Health hazard			(3)

	[Ethylenebis(oxyethylene-nitrilo)]tetraacetic Acid	Organic #1, Orange					
	Ethylenediamine	Organic #2, Red		Health, flammability and contact hazard			(3, 4, 6)
	Ethylene Dichloride	Organic #4, Red		Flammable, Health hazard			(3, 6)
	Ethylene Glycol	Organic #2, Orange					
	Ethylene Glycol Monomethyl Ether	Organic #4, Red		Health and contact hazard			(3, 4)
	Ethyl Formate	Organic #2, Red		Flammable			(6)
	2-Ethyl-1-hexanol	Organic #2, Red					
	Ethyl Iodide	Organic #1, Blue		Health hazard			(3)
	Ethylene Oxide	Organic #5, Red		Highly flammable (fireproof storage)			(2, 3, 6)
	Eugenol	Organic #1, Orange					
	Evan's Blue	Misc., Dye, Orange					
	F.A.A. Solution	Organic #2, Red		Contains formaldehyde, ethyl alcohol and acetic acid			(6)
	Fast Green FCF	Organic, Blue		Health hazard			(3)
	Fehling's Solution A	Inorganic #2, Orange					
	Fehling's Solution B	Inorganic #4, Orange					
	Ferric Acetate	Inorganic #2, Orange		Combustible			
	Ferric Ammonium Acetate	Inorganic #2, Orange					
	Ferric Ammonium Citrate	Inorganic #2, Orange					
	Ferric Ammonium Sulfate	Inorganic #2, Orange					
	Ferric Chloride	Inorganic #2, Orange					
	Ferric Citrate, n-Hydrate	Inorganic #9, Orange					
	Ferric Nitrate	Inorganic #3, Yellow		Oxidant, Reactive			(5)
	Ferric Oxide	Inorganic #4, Orange		Contact hazard			(4)
	Ferric Phosphate	Inorganic #2, Orange					
	Ferric Subsulfate Solution	Inorganic #2A, Orange					
	Ferric Sulfate	Inorganic #2, Orange					
	Ferrous Ammonium Sulfate	Inorganic #2, Orange					
	Ferrous Chloride	Inorganic #2, Orange		Contact hazard, corrosive			(4)

	Ferrous Nitrate	Inorganic #3, Orange		Oxidant			(5)
	Ferrous Oxide (Iron (2) oxide)	Inorganic #4, Orange		Pyrophoric as powder			(1, 6)
	Ferrous Sulfate	Inorganic #2, Orange					
	Ferrous Sulfide	Inorganic #5, Orange		Spontaneously ignites with air if moist			
	Feulgen Stain	Miscellaneous, Dye, Orange		See Schiff Reagent			
	Flagella Stain	Miscellaneous, Dye, Orange		See Loeffler's Stain			
	Florisil	Inorganic #4A, Orange					
	Fluoboric Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Fluorescein	Organic #8, Orange		Health hazard			(3)
	1-Fluoro-2,4-dinitrobenzene	Organic #3A, Blue		Health hazard			(3)
	Formaldehyde	Organic #3, Red		Health and contact hazard			(2, 3)
	Formalin	Organic #3, Blue		37%-50% solution of formaldehyde, Health hazard			(2, 3)
	Formamide	Organic #3, Blue		Health hazard, flammable			(3, 6)
	Formic Acid	Organic #1, Red		Above 156°F. explosive vapor air mixtures, contact hazard			(1, 4, 6)
	Formic Acid, ammonium Salt	Organic #2A, Orange					
	Fructose	Miscellaneous, Orange					
	Furfural	Organic #3A, Red					
	Fuchsin	Miscellaneous, Orange					
	Fumaric Acid	Organic #1, Red		Combustible			(3, 6)
	D-(+)-Galactose	Organic Misc., Orange					
	Gallic Acid, Monohydrate	Organic #1, Orange					
	Gallium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Gasoline	Organic #3, Red		Highly flammable			(3, 6)
	Gelatin	Miscellaneous, Orange					
	Gentian Violet	Miscellaneous, Orange		See Methyl Violet			

	Germanium, HydroLink 10,000 μg/mL (1.00% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Gibberellic Acid	Organic #1, Orange					
	Giemsa Stain	Organic #2, Dye, Red		Health and contact hazard, flammable			(3, 4, 6)
	Gilson Fluid	Organic #2, Orange		Contains acetic acid, nitric acid, ethyl alcohol, & zinc chloride			(4, 6)
	Glucose	Organic #2, Orange					
	Gluconic Acid	Organic #1, Orange					
	L-(+)-Glutamic Acid	Organic #1, Orange					
	L-(+)-Glutamine	Organic #2, Orange					
	Glutaraldehyde	Organic #3, White		Contact hazard			(4)
	Glutaric Acid	Organic #1, Orange					
	Glutathione Reduced	Organic, Orange					
	Glycerin	Organic #2, Orange		See Glycerol			(1)
	Glycerol	Organic #2, Orange					
	β-Glycerophosphoric Acid	Organic #1, Orange					
	Glycine	Organic #2A, Orange					
	Glycogen (from Oysters)	Organic misc., Orange					
	Glycolic Acid	Organic #1, Orange					
	Glyoxal	Organic #3A,Orange		Health hazard			(3)
	Gold, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Gold, 5,000 μg/mL (0.05% w/v)	Inorganic #1, White		Contact hazard			(4)
	Gold Chloride, Trihydrate, Crystal	Inorganic #2, White		Contact hazard			(4)
	Gold Foil	Inorganic #1, Orange					
	Gram's Iodine Stain	Miscellaneous, Dye, Orange					
	Graphite	Inorganic #1, Red		Flammable			(6)
	Guaiacol	Organic #8, Red					
	Guanidine Hydrochloride	Inorganic #2A, Orange					
	Guanidine Monothiocyanate	Inorganic #7A, Orange					
	Gum Arabic	Organic #1, Orange					

	Gum Tragacanth	Organic #2, Orange					
	Gypsum	Inorganic #2, Orange		See Calcium Sulfate			
	Hayem's Solution	Inorganic #2, Blue		Contains mercuric chloride, sodium chloride & sodium sulfate			(2, 3)
	Helium	Bottled gas					
	Hematoxylin	Organic #2, Orange		Health hazard			(3)
	HEPES, Free Acid	Organic #1, Orange					
	n-Heptane	Organic #3, Red		Flammable; explosive vapor air mixtures			(6)
	1-Heptanesulfonic Acid	Organic #1, Orange					
	Hexachlorobenzene	Organic #4, Blue		Health hazard			(2, 3)
	Hexachlorophene [2,2-Methylenebis (3,4,6 trichlorophenol)]	Organic #8, Blue		Health and contact hazard			(3, 4)
	Hexadecane	Organic #3, Orange					
	1-Hexadecylpyridinium Chloride, Monohydrate	Organic #4, Orange					
	Hexadecyltrimethylammonium Bromide	Organic #4, Orange					
	1,1,1,3,3,3-Hexafluoro-2-propanol	Organic #4, White		Contact hazard			(4)
	1,1,1,3,3,3-Hexamethyldisilazane	Organic #3B, Red Stripe		Flammability and contact hazard			(4, 6)
	Hexamethylenetetramine	Organic #2A, Orange					
	Hexanes	Organic #3, Red		Health hazard, flammable			(3, 6)
	Hexane (97% n-hexane)	Organic #3, Red		Flammable			(6)
	1,6-Hexanediamine	Organic #3, Red					
	2,5-Hexanedione	Organic #3, Red		Flammable			
	1-Hexanesulfonic Acid, Sodium Salt	Organic #1, Orange					
	1-Hexanol	Organic #2A, Red					
	2-Hexanone	Organic #4, Red		Health and flammability hazard			(3, 6)
	1-Hexene	Organic #3, Red		Flammable			(6)
	L-(+)-Histidine	Organic #2A, Orange					

	Holtfreter's Solution	Inorganic #2, Orange		Contains sodium chloride, potassium chloride, calcium chloride, sodium bicarbonate			
	Hydrazine, Anhydrous	Organic #2, Red Stripe		Health, flammability, reactivity and contact hazard			(3, 4, 5, 6)
	Hydrazine, Monohydrate	Organic #2, Red Stripe		Health and contact hazard, reactive, flammable			(3, 4, 5, 6)
	Hydrazine Dihydrochloride	Inorganic #2A, White Stripe		Health hazard			(3)
	Hydrazine Sulfate, Crystal	Inorganic #2A, Blue		Health hazard			(3)
	Hydriodic Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Hydrobromic Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Hydrobromic Acid (30-32% in Acetic Acid	InorganicRed		Contact and health hazard			(3, 4)
	Hydrochloric Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Hydrochloric Acid, 0.2N Volumetric Solution	Inorganic #9, Orange					
	Hydrofluoric Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Hydrogen	Bottled Gas, Red		Highly flammable, explosive gas/air mixture			(6)
	Hydrogen Peroxide>29%	Inorganic #6, Yellow		Enhances combustion of other substances, possible explosive mixed with other substances, contact hazard, reactive			(4, 5)
	Hydrogen Peroxide, 3%	Inorganic #6, Orange					
	Hydrogen Sulfide	Inorganic #5, Red		Highly flammable, explosive gas			(1, 2, 3, 4, 6)
	Hydroiodic Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	HydroLink Long Ranger Gel Solution, 50% Concentrate	Organic Misc., Blue		Health and contact hazard			(3, 4)
	HydroLink SEQ Non-Urea DNA Sequencing Gel Kit, 250N	Organic # , White Stripe		Health and contact hazard			(3, 4)
	HydroLink SEQ Non-Urea DNA Sequencing Gel Kit, 500N	Organic #, White Stripe		Health and contact hazard			(3, 4)
	HydroLink D600	Organic Orange		Health hazard			(3)

	HydroLink D5000	Organic Blue		Health and contact hazard			(3, 4)
	HydroLink Electro Transfer Kit	Organic White Stripe		Contact hazard			(4)
	HydroLink MDE Gel, 2x Concentrate	Organic Blue		Health and contact hazard			(3, 4)
	HydroLink Transfer Buffer (100x-High pH)	Organic White Stripe		Contact hazard			(4)
	HydroLink SEQ Non-Urea DNA Sequencing Gel Solution	Organic Blue		Contact and health hazard			(3, 4)
	HydroLink SEQ Denatruing Buffer	Organic Orange					
	HydroLink SEQ Running Buffer, 20x Concentrate	Organic White Stripe		Contact hazard			(4)
	Hydroquinone	Organic #3, Orange		Flammable, Health hazard, contact hazard			(2, 3, 4, 6)
	8-Hydroxy-7-iodo-5-quinoline-sulfonic Acid	Organic #1, Orange					
	Hydroxylamine Hydrochloride, Crystal	Inorganic #2A, Red		Health and reactivity hazard			(3, 4)
	Hydroxylamine Sulfate	Inorganic #2A, White		Contact hazard			(4)
	4-Hydroxy-4-methyl-2-pentanone	Organic #4, Red					
	Hydroxy Naphthol Blue	Misc., Dye, Orange					
	Hydroxy Naphthol Blue, Solid Dilution	Misc., Dye, Orange					
	Hypophosphorus Acid, 50%	Inorganic #9, Yellow Stripe		Reactivity hazard			(5)
	Imidazole	Organic 2A, White		Contact hazard			(4)
	Indigo	Miscellaneous, Dye, Orange					
	Indigo Carmine	Miscellaneous, Dye, Orange		Health hazard			(3)
	5,5'-Indigodisulfonic Acid, Disodium Salt	Organic #1, Orange					
	Indium Trichloride, Anhydrous	Inorganic #2, Blue		Health hazard			(2, 3)
	Indole	Organic #3A, Orange					
	Indolacetic Acid	Organic #1, Orange					
	Indole-3-butyric Acid	Organic #1, Orange					
	Indolphenol Sodium Salt	Inorganic #8, Orange					

	meso-Inositol	Organic Misc., Orange					
	Iodic Acid, Crystal	Inorganic #9, Orange					
	Iodine, Sublimed	Inorganic #2, White		Contact and health hazard			(4)
	Iodine (crystals)	Inorganic #2, White		Contact hazard			(4)
	Iodine, Tincture, 2%	Inorganic #2, Red		Flammability hazard			(3, 4)
	Iodine (Iodine-Iodide),DILUT-IT Analytical Concentrate, N/100 (0.01N)	Inorganic #2, White		Health and contact hazard			(3, 4)
	Iodine (Iodine-Iodide), 1N Volumetric Solution	Inorganic #2, Blue		Health hazard			(3)
	Iodine Monochloride	Inorganic #2, Yellow Stripe		Contact, health and reactivity hazard			(3, 4, 5)
	Iodine Pentoxide	Inorganic #4, Yellow		Reactivity and contact hazard			(4, 5)
	Iodoacetic Acid	Organic #1, White		Contact hazard			(4)
	Iodoform, Powder	Organic #3A, Blue		Health hazard			(3)
	Iodomethane (see Methyl Iodine)	Organic #3A, Blue		Health and contact hazard			(2, 3, 4)
	Iron Acetate	Inorganic #2, Orange		See Ferric Acetate			
	Iron, Powder	Inorganic #1, Red Stripe		Flammable			(6)
	Iron, Chips	Inorganic #1, Orange					
	Iron, DILUT-IT Analytical concentrate, Standard, 1 g Fe^{3+}	Inorganic #1, White		Health and contact hazard			(3, 4)
	Iron,10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			
	Iron, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			
	Iron Pyrite	Inorganic #2, Orange		See Ferrous Sulfide			
	Iron, metal	Inorganic #1, Orange					
	Isoamyl Alcohol	Organic #2, Red		Combustible			(6)
	Isobutyl Alcohol	Organic #2, Red		Combustible, explosive above 82ºF.			(6)
	Isopentyl Alcohol	Organic #2, Red		See Isoamyl Alcohol			(6)
	Isopropanol (Isopropyl Alcohol)	Organic #2, Red		Flammable, peroxidizable			(5, 6)
	Isopropyl Alcohol	Organic #2, Red		Flammable			(6)
	Isopropyl Ether	Organic #4, Red		Highly flammable, severe explosion hazard, peroxidizable			(1, 6)

	Janus Green B	Miscellaneous, Dye, Orange					
	Kaolin	Inorganic #4, Orange					
	Kerosene	Organic #3, Red		Combustible; above 110ºF. Vapor air mixtures are explosive			(3, 6)
	Kieselguhr	Inorganic #4A, Orange					
	Lactic Acid	Organic #1, White Stripe		Contact hazard			(4)
	Lactose	Miscellaneous, Orange					
	Lanolin	Organic Misc., Orange					
	Lanthanum, 1% w/v	Inorganic #1, White		Contact hazard			(4)
	Lanthanum, 1,000 μg/mL (0.10% w/v)	Inorganiic #1, White		Contact hazard			(4)
	Lanthanum Chloride, 7-Hydrate	Inorganic #2, Orange					
	Lanthanum Nitrate, 6-Hydrate	Inorganic #3B, Yellow					
	Lanthanum Oxide	Inorganic #4A, Orange					
	Lauric Acid	Organic #1, Orange		Combustible			
	Lead, Granular	Inorganic #1A, Blue		Health hazard			(2, 3)
	Lead, DILUT-IT Analytical Concentrate, Standard, 1g Pb^{2+}	Inorganic #1, White		Health and contact hazard			(3, 4)
	Lead, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Lead, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Lead Acetate	Inorganic #2, Blue		Health hazard			(3)
	Lead Arsenate	Inorganic #7, Blue		Health hazard			(3)
	Lead Carbonate	Inorganic #4, Blue		Health hazard			(2, 3, 4)
	Lead Chloride	Inorganic #2, Blue		Oxidant, Health hazard			(2, 3)
	Lead Chromate, Powder	Inorganic #8, Blue		Health hazard			(3)
	Lead Diacetate	Inorganic #1A, Blue		Health hazard			(2, 3)
	Lead Dioxide	Inorganic #4, Yellow		Enhances the combustion of other substances; oxidant; reacts violently, Health hazard			(2, 3, 5)
	Lead Iodide	Inorganic #2, Blue		Health hazard			(2, 3)
	Lead Monoxide (Litharge)	Inorganic #4, Blue		Health hazard			(2, 3)

	Lead Nitrate	Inorganic #3, Yellow		Enhances combustion of other substances; oxidant, Health hazard			(2, 3)
	Lead Oxide	Inorganic #4, Blue		Oxidant; strong reactant, Health hazard			(2, 3)
	Lead Peroxide	Inorganic #4, Yellow		See Lead Dioxide, Health hazard			(2, 3)
	Lead Sulfate	Inorganic #2, White		Health and contact hazard			(2, 3)
	Lead Sulfide	Inorganic #5, Blue		Health hazard			(2, 3)
	Lead Tetraacetate	Inorganic #2, Blue		Health hazard			(3)
	Lead Tetraoxide	Inorganic #4, Blue		See Lead Oxide, Health hazard			(2, 3)
	Lead, metal	Inorganic #1, Blue		Health hazard			(2, 3)
	Lime Water	Inorganic #4, Orange		See Calcium Hydroxide			(3)
	Linseed Oil	Organic #2, Red		Flammable			(6)
	Lithium, 10,000 μg/mL (1.00% w/v)	Inorganic #1B, Blue		Health hazard			(3)
	Lithium, 1,000 μg/mL (0.10% w/v)	Inorganic #1B, White		Contact hazard			(4)
	Lithium Aluminum Hydride	Inorganic #1B, Red Stripe		Flammability, reactivity and contact hazard			(4, 5, 6)
	Lithium meta-Borate	Inorganic #4, Orange					
	Lithium Carbonate	Inorganic #4, Orange		Contact hazard			(4)
	Lithium Chloride	Inorganic #2, Orange		Health hazard			(3)
	Lithium Hydroxide	Inorganic #4, White		Reacts violently with acids, Health and contact hazard			(3, 4)
	Lithium, metal	Inorganic #1, Red stripe		Flammable; reacts violently with water, oxidants (fireproof storage), contact hazard, do not store with acids, oxidizers or solvents			(5, 6)
	Lithium Nitrate	Inorganic #3, Yellow		Oxidant, Reactive			(5)
	Lithium Perchlorate, Anhydrous	Inorganic 6A, Yellow		Reactivity hazard, oxidant			(5)
	Lithium Sulfate	Inorganic #2, Orange					
	Lithium Tetraborate, Flux Grade	Inorganic #8, Orange					
	Litmus	Miscellaneous, Orange					
	Loeffler's Flagella Stain	Organic #2, Orange		Contains fuchsin, ethyl alcohol & aniline			(3)

	Logwood Extract (Hematin)	Organic #2, Orange					
	Lugol's Iodine	Inorganic #2, Blue					
	Luminol	Miscellaneous, Orange					
	Lycopodium Powder	Miscellaneous		Explosive as dust			(1)
	Lye	Inorg. #4, White stripe		See Sodium Hydroxide, Health and contact hazard			(3, 4)
	Lysine	Organic misc., Orange					
	Magnesium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Magnesium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Magnesium, Turnings	Inorganic #1B, Red Stripe					
	Magnesium, Ribbon	Inorganic #1B, Red Stripe					
	Magnesium Acetate	Inorganic #2, Orange					
	Magnesium Bromide	Inorganic #2, Orange					
	Magnesium Carbonate	Inorganic #4, Orange					
	Magnesium Chloride	Inorganic #2, Orange					
	Magnesium Nitrate	Inorganic #3, Yellow		Enhances combustion of other substances; oxidant, Reactive			(5)
	Magnesium Oxide	Inorganic #4, Orange					
	Magnesium Sulfate	Inorganic #2, Orange					
	Magnesium Trisilicate	Inorganic #4, Orange					
	Magnesium, metal	Inorganic #1, Red		Highly flammable in powder form; explosive			(1, 6)
	Malachite Green	Miscellaneous, Orange					
	Malachite Green Oxalate	Organic #3A, White		Health and contact hazard			(3, 4)
	Maleic Acid	Organic #1, Orange		Combustible			(6)
	Maleic Anhydride	Organic #1, White		Health and contact hazard			(3, 4)
	Malic Acid	Organic #1a, Orange					
	Malonic Acid	Organic #1, Orange		Contact hazard			(4)
	Maltose	Miscellaneous, Orange					
	Manganese, 10,000 μg/mL (1.00% w/v)	Inorganic #1B, Blue		Health hazard			(3)

	Manganese, 1,000 μg/mL (0.10% w/v)	Inorganic #1B, White		Contact hazard			(4)
	Manganese, DILUT-IT Analytical Concentrate, Standard, 1g Mn^{2+}	Inorganic #1B, White		Contact hazard			(4)
	Manganese Bromide (Manganous Bromide)	Inorganic #2, Orange					
	Manganese Carbonate (Manganous Carbonate)	Inorganic #4, Orange					
	Manganese Chloride (Manganous Chloride)	Inorganic #2, Orange					
	Manganese Dioxide	Inorganic #4, Orange		Enhances combustion of other substances; many reactions may cause fire and explosion, reactive			(5)
	Manganese Nitrate (Manganous Nitrate)	Inorganic #3, Yellow		Oxidant, reactive, contact hazard			(4, 5)
	Manganese Oxide (Manganous Oxide)	Inorganic #4, Orange		Unstable explosive. Powerful oxidizer			(1)
	Manganese Sulfate (Manganous Sulfate)	Inorganic #2, Orange					
	Manganese, metal	Inorganic #1B, Red stripe		Dust is flammable			(6)
	Mannitol, Powder	Organic #2A, Red					
	D-(+)-Mannose	OrganicOrange					
	Marble Chips	Misc., Orange					
	Mayer's Fluid	Inorganic #2, Orange					
	levo-Menthol	Organic Misc., Orange					
	Mercaptoacetic Acid	Organic #1, Orange					
	Mercaptoethanol	Organic #2A, Red		Flammable, contact hazard, stench			(3, 4, 6)
	Mercuric Acetate, Powder	Organic #4, Blue		Health and contact hazard			(3, 4)
	Mercuric Bromide	Inorganic #2A, Blue		Health and contact hazard			(3, 4)
	Mercuric Chloride	Inorganic #2, Blue		Health and contact hazard			(2, 3)
	Mercuric Iodide	Inorganic #2, Blue		Health and contact hazard			(2, 3)

	Mercuric Nitrate	Inorganic #3, Yellow stripe		Enhances combustion of other substances; strong oxidant, Health and contact hazard, reactive			(2, 3, 4, 5)
	Mercuric Oxide	Inorganic #4, Blue		Health and contact hazard			(2, 3, 4)
	Mercuric Sulfate	Inorganic #2, Blue		Decomposes on exposure to light, Health and contact hazard			(2, 3)
	Mercuric Sulfide	Inorganic #5, Blue		Health hazard, reactive			(2, 3)
	Mercuric Thiocyanate	Inorganic #7A, Blue		Health and contact hazard			(3, 4)
	Mercurous Chloride	Inorganic #2, Blue		Health and contact hazard			(2, 3)
	Mercurous Nitrate	Inorg. #3, Yellow stripe		Health, contact and reactivity hazard, , oxidant			(2, 3, 5)
	Mercurous Oxide	Inorganic #4, Yellow		Oxidant, reactive, Health hazard			(2, 3, 4, 5)
	Mercury	Inorganic # 1, Blue		Health hazard, Toxic Vapors, corrosive			(2, 3, 4)
	Mercury, DILUT-IT Analytical Concentrate, Standard, 1g Hg^{2+}	Inorganic #1, White		Health and contact hazard			(3, 4)
	Mercury, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Mercury, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Mercury, Triple distilled	Inorganic #1, Blue		Health and contact hazard			(3, 4)
	Mercury Bichloride	Inorganic #2, Blue		See Mercuric Chloride, Health and contact hazard			(2, 3, 4)
	Mesitylene	Organic #3A, Red					
	Methanol, Methyl Alcohol	Organic #2, Red		Flammable; vapor air mixture explosive (fireproof storage, separate from oxidants), Health hazard			(3, 6)
	DL-Methionine	Organic #2A, Orange					
	2-Methoxyethanol	Organic #2A, Red		Health and contact hazard			(3, 4)
	p-Methoxyphenol	Organic #8, Red					
	Methyl Acetate	Organic #4, Red		Flammable			(6)
	Methylamine (40% in H_2O)	Organic #2, Red		Flammable			(6)
	p-(Methylamino)phenol Sulfate	Organic #2, Orange					

	Methyl Benzoate	Organic #3A, Red					
	Methyl Bromide	Organic #2A, Orange		Health hazard, corrosive, severe inhalation hazard			(2, 3, 4)
	2-Methylbutane	Organic #3A, Red		Flammable			(6)
	Methyl iso-Butyl Ketone	Organic #4, Red		Flammable			(6)
	Methyl Cellulose	Miscellaneous, Blue		Health hazard			(3)
	Methyl Chloride (Chloromethane)	Organic #4, Blue		Health hazard, flammable gas			(2, 3)
	Methylcyclohexane	Organic #3A, Red		Flammable			(6)
	Methyl Ethyl Ketone (MEK)	Organic #2, Red		Highly flammable; vapor air mixtures explosive (fireproof storage, separate from oxidants), Health hazard			(2, 3, 4, 6)
	Methyl p-Hydroxybenzoate	Organic #3A, Orange					
	Methyl Iodide	Organic #4, Blue		Health and contact hazard, lachrymator			(3, 4)
	Methyl Isocyanate	Organic #5B, Red Stripe		Flammable, Contact and health hazard			(3, 4, 6)
	Methyl Methacrylate (Inhibited)	Organic #3, Red stripe		Flammable; vapor air mixture explosive (fireproof storage, cool)			(4, 6)
	N-Methyl-N-nitroso-p-toluenesulfonamide	Organic #2A, Orange					
	Methyl Orange	Miscellaneous, Orange					
	2-Methyl-2,4-pentanediol	Organic #2A, Orange					
	1-Methyl-2-pyrrolidinone	Organic #4A, Red					
	Methyl Red Hydrochloride, Crystal	Miscellaneous, Orange					
	Methyl Salicylate	Organic #3, Orange		Contact hazard			(4)
	Methyl Sulfoxide (Dimethyl Sulfoxide)	Organic #4, Orange					
	Methyl Violet	Miscellaneous, Orange					
	N,N' - Methylenebisacrylamide	Organic #2A, White		Health and contact hazard			(3, 4)
	Methylene Blue	Miscellaneous, Orange					(3)
	Methylene Bromide	Organic #4A, Orange		Health hazard			(3)

	Methylene Chloride	Organic #4, Blue		Health hazard			(2, 3)
	Mineral Oil	Organic #3, Orange		Flammable			(6)
	Molasses	Miscellaneous, Orange					
	Molybdenum, 10,000 μg/mL (1.00% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Molybdenum, 1,000 μg/mL (0.10% w/v)	Inorganic #1, Orange					
	Molybdenum Trioxide, Powder	Inorganic #4A, Orange					
	Molybdic Acid, 85% Powder	Inorganic #9, Orange					
	Monochloroacetic Acid	Organic #1, White		Contact hazard			(4)
	Monoethanolamine	Organic #2A, Red		Contact hazard			(4)
	Morpholine	Organic #2A, Red		Flammability and contact hazard			(4, 6)
	Naphthalene	Organic #2, Red		Flammable			(6)
	1-Naphthaleneacetic Acid	Organic #1, Orange					
	1-Naphthol	Organic #2, White		Contact hazard			(4)
	2-Naphthol	Organic #2, Orange		Health hazrd			(3)
	p-Naphtholbenzein	Organic #3A, Orange					
	1,2-Naphthoquinone-4-sulfonic Acid, Sodium Salt	Organic #7, Orange					
	N-1-Naphthylethylenediamine Dihydrochloride	Organic #2, Orange					
	Nessler's Reagent	Inorganic #2, Blue		Health hazard			(3)
	Niacin	Organic Misc., Orange					
	Nickel, Shot	Inorganic #1, Blue		Health and contact hazard			(3, 4)
	Nickel, DILUT-IT Analytical Concentrate, Standard, 1g Ni^{2+}	Inorganic #1, White		Health and contact hazard			(3, 4)
	Nickel, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Orange		Health hazard			(3)
	Nickel, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Nickel (II) Ammonium Sulfate	Inorganic #2, Blue		Health and contact hazard			(2, 3, 4)
	Nickel (II) Acetate	Inorganic #2, Blue		Health and contact hazard			(2, 3, 4)
	Nickel (II) Carbonate	Inorganic #6, Blue		Health and contact hazard			(2, 3, 4)
	Nickel Chloride	Inorganic #2, Blue		Health hazard			(2, 3)

	Nickel Hydroxide	Inorganic #4, Blue		Health hazard			(2, 3)
	Nickel Nitrate	Inorganic #3, Yellow		Oxidant, reactive, health and contact hazard			(2, 3, 5)
	Nickel Oxide	Inorganic #4, Blue		Health and contact hazard			(2, 3)
	Nickel Powder	Organic #1, Blue		Health hazard			(2, 3)
	Nickel Sulfate	Organic #2, Blue		Health and contact hazard			(2, 3)
	Nickel, metal	Organic #2, Blue		Health hazard			(2, 3)
	Nicotine	Organic #4, Blue		Health and contact hazard			(2, 3)
	Nicotine Sulfate	Organic #2, Blue		Health hazard			(2, 3)
	Nicotinic Acid (Niacin)	Organic #1, Orange		Health hazard			(2, 3)
	Nigrosine Black	Miscellaneous, Orange					
	Ninhydrin	Organic #2, Orange		Health hazard			(3)
	Niobium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Nitric Acid	Inorganic #3, Yellow		Many reactions may cause explosion, oxidant, health and contact hazard			(3, 4, 5)
	Nitrilotriacetic Acid	Organic #1, Blue		Health hazard			(3)
	p-Nitroaniline	Organic #2A, Blue		Health and contact hazard			(3, 4)
	Nitrobenzene	Inorganic #4, Red		Health and contact hazard			(3, 4)
	Nitrobenzeneazoresorcinol	Organic #8, Red		Combustible			
	Nitrogen	Bottled Gas					
	Nitroglycerin	Organic #4A, Red		Explosive			(1)
	Nitromethane	Organic #3A, Orange					
	o-Nitrophenol	Organic #8, Orange					
	1-Nitroso-2-naphthol	Organic #2, Orange					
	Nucleic Acid	Organic #1, Orange					
	Octane	Organic #3A, Red		Flammable			(6)
	1-Octanesulfonnic Acid	Organic #7, Orange					
	Octanol	Organic #3A, Red					
	Oleic Acid	Organic #1, Orange					
	Olive Oil	Miscellaneous, Orange					
	Orange IV (Torpeolin 00)	Miscellaneous					

	Orcein Staining Solution	Miscellaneous, Orange		Contains orcein, hydrochloric acid & ethyanol, Flammable liquid			(6)
	Orcinol	Organic #3A, Orange					
	L-(+)-Ornithine Monohydrochloride	Organic #4, Orange					
	Osmic Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Osmium Tetroxide	Inorganic #4, Blue		Vapors are highly irritating, Health hazard			(2, 3)
	Oxalic Acid	Organic #1, White		Separate from oxidants and strong bases, Health and contact hazard			(3, 4)
	Oxalyl Chloride	Organic #4, White		Health and contact hazard			(3, 4)
	2,2'-Oxydiethanol	Organic #2, Orange					
	Oxygen	Bottled gas		Oxidant and reactive			
	Palladium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Palladium, 500 μg/mL (0.05% w/v)	Inorganic #1, White		Contact hazard			(4)
	Palmitic Acid	Inorganic #1, Orange					
	Pancreatin	Miscellaneous, Orange					
	Parachloro-m-cresol	Organic #8, Orange		Health hazard			(3)
	Paraffin	Miscellaneous, Orange					
	Paraformaldehyde	Organic #3A, Red		Health and contact hazard			(3, 4, 6)
	Pararosanilin Hydrochloride	Organic #4, Blue		Health hazard			(3)
	Peanut Oil	Miscellaneous, Orange					
	Pentachlorophenol	Organic # 8, Blue		Health and contact hazard,			(2, 3, 4)
	Pentane	Organic #3, Red		Highly flammable; vapor air mixture explosive (fireproof storage)			(6)
	2,4-Pentanedione	Organic #4, Red					(6)
	1-Pentanesulfonic Acid, Sodium Salt, Monohydrate	Organic #7, Orange					
	3-Pentanol	Organic #2, Red					
	2-Pentanone	Organic #4, Red		Flammable			(6)

	2-Pentene	Organic #4, Red		Flammable			(6)
	iso-Pentyl Acetate	Organic #4, Red		Flammable			(6)
	Pepsin, Powder	Organic Misc., Orange					
	Perchloric Acid	Inorganic #6, Yellow		Reactive, health and contact hazard, oxidant, unstable in concentrations >72%			(1, 3, 4, 5)
	Perchloric Acid, 0.1N in Glacial Acetic Acid Volumetric Solution	Inorganic #6, Red		Contact hazard			(4)
	Periodic Acid	Inorganic #9, Yellow stripe		Health and contact hazard			(3, 4)
	Petroleum Ether	Organic #4, Red		Highly flammable			(6)
	Phenacetin, Powder	Organic #4, Blue		Health hazard			(3)
	1,10-Phenanthroline, Monohydrate	Organic #2A, Orange					
	1,10-Phenanthroline, Monohydrochloride,Monohydrate	Organic #2A, Orange					
	Phenethylamine	Organic #2A, Red					
	Phenol (carbolic acid)	Organic #8, Red Stripe		Health and contact hazard, flammable			(3, 4, 6)
	Phenolphthalein	Miscellaneous, Orange					
	2-Phenoxyethanol	Organic #2,Orange					
	Phenylacetic Acid	Organic #1, Orange					
	Phenylacetonitrile	Organic #4, Blue		Health hazard			(3)
	L-Phenylalanine	Organic #2, Orange					
	Phenylhydrazine	Organic #3B, Red Stripe		Health and contact hazard			(3, 4)
	Phenylhydrazine Hydrochloride	Organic #4, Blue		Health and contact hazard			(3, 4)
	Phenyl Isocyanate	Organic #5B, Red		Health and contact hazard, flammable			(3, 4, 6)
	Phenyl Isothiocyanate	Organic #5B, Blue		Health hazard			(3)
	Phenyl Red	Organic Misc., Orange					
	Phenyl Salicylate (Salol)	Organic #3, Orange		Combustible			
	Phloroglucinol, Dihydrate	Organic #3A, Orange					
	Phloxine B	Organic misc., Orange					
	Phosphate Buffer, M/15, pH 6.8	Inorganic #2A, Blue		Health hazard			(3)

	Phosphate, DILUT-IT Analytical Concentrate, Standard	Inorganic #2, Orange					
	Phosphomolybdic Acid, x-Hydrate, Crystal	Inorganic #9, Orange					
	Phosphoric Acid	Organic #1, White		Health and contact hazard			(3, 4)
	Phosphorus (Red)	Inorg. #10, Red stripe		Separate from oxidants, flammable			(6)
	Phosphorus (White)	Inorg. #10, Red stripe		Flammable; Ignites upon contact with air, health hazard			(3, 4, 6)
	Phosphorus Pentoxide	Inorganic #10, White		Many reactions may cause fire or explosion, vapors will ignite in air, health and contact hazard			(3, 4, 6)
	Phosphorus Oxychloride	Inorganic #2A, White stripe		Contact, health and reactivity hazard			(3, 4, 5)
	Phosphotungstic Acid, n-Hydrate, Crystal	Inorganic #9, Orange					
	o-Phthalaldehyde	Organic #4A, Blue		Health hazard			(3)
	Phthalic Acid	Organic #1, Orange					(3, 4)
	Phthalic Anhydride	Organic #1, White stripe		Contact and health hazard			(3, 4)
	Picric Acid and its salts, DRY	Organic #8, Red		Explosive if dry			(1!, 4, 5)) Bomb Squad
	Picric Acid and its salts, WET	Organic #8, Red		Keep wet!, >10% water			(1, 4, 5)
	Pilocarpine Nitrate	Organic, White		Health and contact hazard			(3, 4)
	Platinum, 500 μg/mL (0.05% w/v)	Inorganic #1, White		Contact hazard			(4)
	Platinum Chloride Solution	Inorganic #2, Blue		Health hazard			(3)
	Podophyllum Resin	White		Health and contact hazard			(3, 4)
	Polyethylene Glycol 200	Organic #2A, Orange					
	Polyvinyl Alcohol	Organic #2A, Red					
	Potash Solution	Inorganic #10, Red		Flammable			(6)
	Potassium Solution, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Potassium Solution, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)

	Potassium, DILUT-IT Analytical Concentrate, Standard, 1g K^+/L	Inorganic #1, Orange					
	Potassium, Lump	Inorganic #1B, Red Stripe		Contact, health, flammability and reactivity hazard			(3, 4, 5, 6)
	Potassium Acetate, Crystal	Organic #4, Orange					
	Potassium Bicarbonate	Inorganic #4, Orange					
	Potassium Biphthalate, Crystal, Acidimetric Standard	Organic #3A, Orange					
	Potassium Bisulfate	Inorganic #2, Orange					
	Potassium Bitartrate	Inorganic #2, Orange					
	Potassium Bromate	Inorganic #2, Yellow		Reactive			(5)
	Potassium Bromide	Inorganic #2, Orange					
	Potassium Carbonate	Inorganic #4, Orange					
	Potassium Chlorate	Inorganic #6, Yellow		Enhances combustion of other substances; if contaminated may explode from shock or mechanical friction			(5)
	Potassium Chloride	Inorganic #2, Orange					
	Potassium Chromate	Inorganic #8, Blue		Contact and health hazard			(2, 3, 4)
	Potassium Citrate	Organic #1, Orange					
	Potassium Cyanate, Crystal	Inorganic #7A, Orange					
	Potassium Cyanide	Inorganic #7B, Blue		Contact and health hazard			(3)
	Potassium Dichromate	Inorganic #8, Yellow		Strong oxidant, reactive, health and contact hazard			(3, 4, 5)
	Potassium Dichromate, DILUT-IT Analytical Concentrate, N/10 (0.1N)	Inorganic #8, Blue		Health and contact hazard			(3, 4)
	Potassium Ferrocyanide	Inorganic #7, Orange					
	Potassium Fluoride	Inorganic #2, Blue		Contact and health hazard			(3, 4)
	Potassium Hydroxide	Inorganic #4, White stripe		Reacts violently with acids, contact and health hazard			(3, 4, 5)
	Potassium Hydroxide, 0.5N in Methanol Volumetric Solution	Inorganic #4, Red		Health, flammability and contact hazard			(3, 4, 6)

	Potassium Hydroxide, 0.5N in Ethanol Volumetric Solution	Inorganic #4, Red		Health, flammability and contact hazard			(3, 4, 6)
	Potassium Hydroxide, DILUT-IT Analytical Concentrate, N/10 (0.1N)	Inorganic #4B, White Stripe		Contact and health hazard			(3, 4)
	Potassium Iodate	Inorganic #8 Yellow		Enhances combustion of other substances; strong oxidant			(5)
	Potassium Iodate, DILUT-IT Analytical Concentrate, N/10 (0.1N)	Inorganic #2, Orange					
	Potassium Iodide	Inorganic #2, Orange					
	Potassium Metal (see also Potassium)	Inorg. #1, Red stripe		Combustible; many reactions may cause fire and explosion; reacts violently with water (fireproof storage separately under paraffin or oil)			(1, 3, 4, 5, 6)
	Potassium Nitrate	Inorganic #3B, Yellow		Enhances combustion of other substances; oxidant; violent reactant			(5)
	Potassium Nitrite	Inorganic #3A, Yellow		Reactivity hazard			(5)
	Potassium Oxalate	Inorganic #2, White		Contact and health hazard			(3, 4)
	Potassium Oxide	Inorganic #4, White		Contact hazard			(4)
	Potassium Perchlorate	Inorganic #6A, Yellow		Reactivity hazard			(5)
	Potassium Periodate, meta	Inorganic #6, Yellow		Enhances combustion of other substances; many reactions may cause fire or explosion			(3, 5)
	Potassium Permanganate	Inorganic #8, Yellow		Enhances combustion of other substances; many reactions may cause fire and explosion; powerful oxidant; violent reactant			(2, 3, 4, 5)
	Potassium Permanganate, DILUT-IT Analytical Concentrate, N/10 (0.1 N)	Inorganic #8, Orange					
	Potassium Persulfate	Inorganic #8, Yellow		Reactive, strong oxidizer			(5)

	Potassium Phosphate	Inorganic #2, Orange					
	Potassium Pyrosulfate	Inorganic #2, Orange					
	Potassium Sodium Tartrate	Inorganic #2, Orange					
	Potassium Sorbate, Powder	Organic #, Orange					
	Potassium Sulfate	Inorganic #2, Orange					
	Potassium Sulfide	Inorganic #5, Red		May ignite spontaneously on contact with air: flammable; explosive on heating (fireproof storage)			(6)
	Potassium Tartrate	Inorganic #2, Orange					
	Potassium Tetroxalate	Organic, Orange					
	Potassium Thiocyanante	Inorganic #2, Orange		Reactive			(2, 3, 5)
	PPO	Organic #8, Orange					
	Procaine Hydrochloride	Organic #2A, Orange					
	Propane	Bottled gas, Red		Highly flammable; explosive air gas mixtures			(6)
	Propanol	Organic #2A, Red		Flammable			(6)
	Propionaldehyde	Organic #3A, Red		Flammable			(6)
	Propionic Acid	Organic #1, Red		Combustible, contact hazard			(4, 6)
	Propionic Acid, Sodium Salt	Organic #1, Orange					
	Propionic Anhydride	Organic #1, Red		Contact hazard			(4)
	Proprietary Solvent, Anhydrous	Organic #1, Red		Flammability and health hazard			(3, 6)
	iso-Propyl Acetate	Organic #4, Red		Flammable			(6)
	Propyl Alcohol	Organic #2, Red		Flammable; vapor-air mixtures explosive			(6)
	Propylene Carbonate	Organic #2A, Orange					
	Propylene Glycol	Organic #2A, Orange					
	Propylene Oxide	Organic #6, Red		Flammability and contact hazard			(4, 6)
	iso-Propyl Ether	Organic #4, Red		Flammable			(6)
	Pyridine	Organic #2, Red		Flammable; vapor-air mixtures explosive (fireproof storage separate from oxidants)			(5, 6)

	Pyridoxine Hydrochloride	Organic #4, Orange					
	Pyrocatechol	Organic #3A, Orange					
	Pyrogallic Acid	Organic #4, Blue		Contact and health hazards			(2, 3, 4)
	Pyrrole	Organic , Red					
	Pyrrolidine	Organic, Red		Flammable			(6)
	Pyruvic Acid, Sodium Salt	Organic #4, Orange					
	Quinaldine	Organic #3, Red					
	Quinhydrone	Organic #2, Orange					
	Quinine Monohydrochloride, Dihydrate	Organic #2, Orange					
	Quinine Sulfate	Organic #2, Orange					
	Quinoline	Organic #3, Blue		Contact hazard			(4)
	8-Quinolinol	Organic #2, Orange					
	Raffinose, 5-Hydrate	Organic Misc., Orange					
	Reinecke Salt, Monhydrate	Orange					
	Resazurin Sodium Derivative	Orange					
	Resorcinol	Organic #2, Red		Combustible			(6)
	Rhodamine B (orO)	Blue		Health hazard			(3)
	Rhodamine 6G	Orange					
	Rhodizonic Acid	Orange					
	Ringer's Solution	Miscellaneous, Orange					
	Rose Bengal	Organic Misc., Orange					
	Rosin	Miscellaneous, Red		Flammable			(6)
	Rosolic Acid	Organic #3A, Orange					
	Saccharin Sodium, Powder	Organic #3A, Blue		Health hazard			(3)
	Saffron, Spanish	Organic Misc., Orange					
	Safranine	Miscellaneous, Dye, Orange					
	Salicin	Organic 2A, Orange					
	Salicylaldehyde	Organic #3A, Red					
	Salicylic Acid	Organic #1, Orange		Dust explosive			(6)
	Sand	Miscellaneous, Orange					

	Saponin	Organic Misc., Orange					
	Scandium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Schiff Reagent	Organic #2, Orange		Contains fuchsin, sodium bisulfite and hydrochloric acid			(4)
	Sebacoyl Chloride	Organic #4, White Stripe		Health and contact hazard			(3, 4)
	Selenium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Selenium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Selenium	Inorganic #1, Blue		Health hazard			(3)
	Selenium and its salts	Inorganic #1, Orange		Inhalation hazard			(3)
	Selenium Dioxide	Inorganic #9, Blue		Health and contact hazard			(3, 4)
	Selenous Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Semicarbazide Hydrochloride, Crystal	Organic #4, Blue		Health hazard			(3)
	Sesame Oil	Organic #4, Orange					
	Silica Gel	Miscellaneous, Orange					
	Silicic Acid	Inorganic #9, Orange					
	Silicon, 10,000 μg/mL (1.00% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Silicon, 1,000 μg/mL (0.10% w/v)	Inorganic #1, Orange					
	Silicon, metal	Inorganic #1, Orange					
	Silicotungstic Acid, n-Hydrate, Crystal	Inorganic #9, White		Health and contact hazard			(3, 4)
	Silver (dust)	Inorganic #1, Blue		Contact and health hazards			(3, 4)
	Silver, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Silver, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(1, 2, 4, 5)
	Silver, DILUT-IT Analytical Concentrate, Standard, 1g Ag^+	Inorganic #1, Orange					
	Silver Acetate	Inorganic #2, Orange					(3, 4)
	Silver Chloride	Inorganic #2, Blue		Health hazards			(3)

	Silver Cyanide	Inorganic #7, Blue		Health and contact hazard			(3, 4)
	Silver Diethyldithiocarbamate	Organic #3, Orange					
	Silver Iodide	Inorganic #2, Blue		Health hazard			(3)
	Silver Nitrate, Crystal	Inorganic #3, Yellow		Many reactions cause fire and explosion; violent reaction with organic substances, Health and contact hazard			(3, 4, 5, 6)
	Silver Nitrate	Inorganic #3A, Orange		Many reactions cause fire and explosion; violent reaction with organic substances, Health and contact hazard			(3, 4, 5, 6)
	Silver Oxide	Inorganic #4, Orange		Oxidant			(5)
	Silver Sulfate	Inorganic #2, Orange		Health hazard			(3)
	Soda Lime	Inorganic #4, White		Contact hazard			(4)
	Sodium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard, flammable, separate from other flammables			(3, 5, 6)
	Sodium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard, flammable			(4, 6)
	Sodium, DILUT-IT Analytical Concentrate, Standard, 1g Na^+	Inorganic #1, Orange					
	Sodium, Lump	Inorganic #1B, Red Stripe		Contact, health, flammability and reactivity hazard			(3, 4, 5, 6)
	Sodium Acetate	Inorganic #2, Orange					
	Sodium Ammonium Phosphate, 4-Hydrate, Crystal	Inorganic #2A, Orange					
	Sodium Arsenate	Inorganic #7, Blue		Health hazard			(2, 3)
	Sodium Arsenite	Inorganic #7, Blue		Health hazard			(2, 3)
	Sodium Azide	Inorganic #3, Red		Explosion possible from concussion, friction (fireproof storage, mix with water, 20%), health hazard			(1, 2, 5)
	Sodium Benzoate	Organic #3A, Orange					
	Sodium Bicarbonate	Inorganic #4, Orange					

	Sodium Biphenyl	Organic #3A, Red		Flammable			(6)
	Sodium Bismuthate	Inorganic #7, Orange					
	Sodium Bisulfate	Inorganic #2, Orange					
	Sodium Bisulfite	Inorganic #2, Orange		Contact hazard			(4)
	Sodium Borate	Inorganic #8, Orange					
	Sodium Borohydride	Inorganic #1, Red		Flammable, reactive, contact hazard.			(4, 5, 6)
	Sodium Bromide	Inorganic #2, Orange		Reacts with acids and metal salts			(5)
	Sodium Carbonate	Inorganic #4, Orange					
	Sodium Chlorate	Inorganic #6, Yellow		Many reactions may cause fire and explosion; strong oxidant			(5)
	Sodium Chloride	Inorganic #2, Orange					
	Sodium Chromate	Inorganic #8, Blue		Oxidant, health and contact hazard			(3, 4)
	Sodium Citrate	Inorganic #8, Orange					
	Sodium Cobaltinitrite, Powder	Inorganic #3A, Orange					
	Sodium Cyanide	Inorganic #7, Blue		Health and contact hazard			(3, 4)
	Sodium Cyanoborohydride	Inorganic #7, Red		Health, flammability and contact hazard			(3, 4, 6)
	Sodium Dichromate	Inorganic #8, Yellow		Many reactions may cause fire and explosion; oxidant, health and contact hazard			(2, 3, 4, 5)
	Sodium Diethyldithiocarbamate, Trihydrate	Organic #3A, Orange					
	Sodium Diphenylaminesulfonate, Powder	Organic #7, Orange					
	Sodium Dithionite	Inorganic #2B, Red stripe		Oxidant, flammable			(5, 6)
	Sodium Dodecyl Sulfate	Organic #7, Orange					
	Sodium Ferrocyanide	Inorganic #7, Orange					
	Sodium Fluoride	Inorganic #2, Blue		Health and contact hazard			(3, 4)
	Sodium Formate, Crystal	Inorganic #4, Orange					
	Sodium Hexametaphosphate	Inorganic #2A, Orange					
	Sodium Hydride	Inorganic #1B, Red Stripe		Flammability, reactivity and contact hazard			(4, 5, 6)

	Sodium Hydrosulfite	Inorganic #2B, Red stripe		See Sodium Dithionite			(6)
	Sodium Hydroxide	Inorganic #4B, White stripe		Reacts violently with acid, contact and health hazard			(3, 4, 5)
	Sodium Hypochlorite	Inorganic #6, Orange		Reacts violently with acids; forms toxic fumes in presence of ammonia			(5)
	Sodium Hypophosphite, Monohydrate, Crystal	Inorganic #5, Orange					
	Sodium Hyposulfate	Inorganic #2, Orange		See Sodium Dithionite			
	Sodium Iodate	Inorganic #2, Yellow		Reactive			(5)
	Sodium Iodide	Inorganic #2, Orange					
	Sodium Lactate	Organic Misc., Orange					
	Sodium Lauryl Sulfate	Inorganic #2, Orange					
	Sodium Metabisulfite	Inorganic #2, Orange					
	Sodium Metal	Inorganic #1, Red Stripe		Combustible and reactive (reacts with water to form sodium hydroxide) store under paraffin or kerosene in flammable cabinet			(1, 3, 4, 6)
	Sodium Metaphosphate	Inorganic #2, Orange					
	Sodium Molybdate	Inorganic #2, Orange					
	Sodium Nitrate	Inorganic #3, Yellow		Enhances the combustion of other substances; strong oxidizer,			(2, 3, 5)
	Sodium Nitrite	Inorganic #3 Yellow		Reactive, health hazards`			(2, 3, 5)
	Sodium Nirtoferricyanide, Dihydrate, Crystal	Inorganic #7A, Blue		Health hazard			(3)
	Sodium Oleate, Powder	Organic #2A, Orange					
	Sodium Oxalate	Inorganic #2, White		Health and contact hazard			(3, 4)
	Sodium Perborate	Inorganic #8, Orange		Oxidant			(5)
	Sodium meta-Periodate	Inorganic #1, Yellow		Reactivity hazard			(5)
	Sodium Permanganate	Inorganic #8 Yellow		Oxidant, reactive			(5)
	Sodium Peroxide	Inorganic #6 Yellow stripe		Many reactions may cause fire and explosion; reacts violently with water, contact hazard, oxidant			(4, 5)

	Sodium Persulfate	Inorganic #2A, Yellow		Reactivity and contact hazard			(4, 5)
	Sodium Phosphate	Inorganic #2A, Orange					
	Sodium Pyrophosphate	Inorganic #2, Orange					
	Sodium Salicylate	Organic #1, Orange					
	Sodium Selenite, 5-Hydrate	Inorganic #5, Blue		Health hazard			(3)
	Sodium Silicate	Inorganic #2, Orange					
	Sodium Silicofluoride (Disodium Hexafluorosilicate)	Inorganic #4, White		Contact hazard			(4)
	Sodium Stannate, Trihydrate	Inorganic #4A, Orange					
	Sodium Sulfate	Inorganic #2, Orange					
	Sodium Sulphide (Anhydrous)	Inorganic #5, Red Stripe		Store separately from acids, oxidants, dry, flammable, contact			(4, 5, 6)
	Sodium Sulfite	Inorganic #2, Orange					
	Sodium Tartrate	Inorganic #2, Orange					
	Sodium Tetraborate	Inorganic #8, Orange		See Sodium Borate			
	Sodium Tetraphenylboron, Powder	Inorganic #8, Orange					
	Sodium Thiocyanate	Inorganic #7, Orange					
	Sodium Thiosulfate	Inorganic #2, Orange					
	Sodium Tungstate	Inorganic #2, Orange					
	Sorbic Acid	Organic #1, Orange					
	Sorbitol	Organic #2A, Orange					
	SPADNS	Organic #7, Orange					
	Stannic Chloride	Inorganic #2, White		Contact hazard			(4)
	Stannic Oxide	Inorganic #2, Orange					
	Stannous Chloride	Inorganic #2, Orange		Health hazard			(3)
	Stannous Oxide	Inorganic #4, Orange					
	Starch	Miscellaneous, Orange					
	Stearic Acid	Organic #1, Orange					
	Strontium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health and contact hazard			(3, 4)

	Strontium 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Strontium Bromide	Inorganic #2, Orange					
	Strontium Carbonate	Inorganic #4A, Orange					
	Strontium Chloride	Inorganic #2, Orange					
	Strontium Nitrate	Inorganic #3, Yellow		Reactive, oxidizer			(5)
	Strychnine	Organic #2A, Blue		Health hazard			(3)
	Strychnine Sulfate, 5-Hydrate	Organic #2A, Blue		Health hazard			(3)
	Styrene	Organic #3A, Red		Flammability and contact hazard			(4, 6)
	Succinic Acid, Crystal	Organic #1, White		Contact hazard			(4)
	Succinic Acid, Disodium Salt, 6-Hydrate	Organic #1, Orange					
	Succinic Anhydride	Organic #1, Orange					
	Sucrose	Miscellaneous, Orange					
	Sudan Black B	Miscellaneous, Dye, Orange					
	Sudan III	Miscellaneous, Dye, Orange					
	Sudan IV	Organic #2, Dye, Orange					
	Sugar	Miscellaneous, Orange					
	Sulfamic Acid	Organic #1, White		Separate from strong bases, contact hazard			(3, 4)
	Sulfanilamide (Not Sterilized)	Organic #2A, Orange					
	Sulfanilic Acid	Inorganic #10, Dye, Orange		Health hazard			(3)
	Sulfate	Inorganic #2A, Orange					
	Sulfathiazole	Organic #7, Orange					
	Sulfosalicylic Acid, Dihydrate, Crystal	Organic #1, Orange					
	Sulfur	Inorganic #10, Orange		Health hazard			(3)
	Sulfur Black Dye	Inorganic #10, Dye, Orange		Health hazard			(3)
	Sulfur Blue Dye	Inorganic #10, Dye, Orange		Health hazard			(3)
	Sulfur Yellow Dye (Napthol yellow, citronin)	Inorganic #10, Dye, Orange		Health hazard			(3)

	Sulfuric Acid	Inorganic #9, White		Many reactions may cause fire and explosion; water reactive, health and contact hazard			(3, 4, 5)
	Sulfurous Acid	Inorganic #9, White		Health and contact hazard			(3, 4)
	Sulfuric Acid Fuming	Inorganic #9, White		Many reactions may cause fire and explosion; water reactive, health and contact hazard			(3, 4, 5)
	Talc	Inorganic Misc., Orange					
	Tannic Acid	Organic #1, Blue		Health hazard			(3)
	Tantalum 10,000 μg/mL (1.00% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Tartaric Acid	Organic #1, Orange					
	TCLP Extraction Fluid 1	Inorganic Misc., Orange					
	Tellurium	Inorganic #1, Blue		Health hazard			(3)
	TEMED	Organic 32A, Red		Flammability hazard			(6)
	Tergitol NP-10 (Nonionic)	Organic #8, Orange					
	Terpineol	Organic #2, Red					
	Testosterone	Organic Misc., Blue		Health hazard			(3)
	1,1,2,2-Tetrabromoethane	Organic #4, Orange					
	Tetrabutylammonium Bromide	Organic #4, Orange					
	Tetrabutylammonium Chloride, Monohydrate	Organic #4, Orange					
	Tetrabutylammonium Hydroxide, 25% in Methanol	Organic #2A, Red		Health, Flammability and Contact hazard			(3, 4, 6)
	Tetrabutylammonium Hydroxide, in water	Organic #3A, White Stripe		Contact hazard			(4)
	Tetrabutylammonium Iodide	Organic #3A, Orange					
	Tetrabutylammonium Perchlorate	Organic #3B,Red Stripe		Reactivity hazard			(5)
	Tetrachloroethane	Organic #4, Blue		Health hazard, lachrymator			(3)
	Tetrachloroethylene	Organic #4, Blue		Health hazard			(3)
	Tetraethylammonium Bromide	Organic #3, Orange					
	Tetraethylammonium Hydroxide (10% in H_2O)	Organic #3, Orange					

	Tetraethyl Orthosilicate	Organic #3, Red					
	Tetrahydrofuran	Organic #4, Red		Highly flammable, vapor air mixtures are explosive; also forms explosive peroxides			(1, 3, 6)
	1,2,3,4-Tetrahydronaphthalene	Organic #3, Red					
	Tetramethylammonium Chloride	Organic #3, Blue		Health hazard			(3)
	Tetramethylammonium Hydroxide (23% in Methanol)	Organic #2, Red		Health, flammability and contact hazard			(3, 4, 6)
	Tetramethylammonium Hydroxide (10% in H_2O)	Organic #3, White		Contact hazard			(4)
	Tetramethylammonium Hydroxide 5-Hydrate	Organic #3, White		Health and contact hazard			(3, 4)
	1,1,3,3-Tetramethylguanidine	Organic #3, Red		Health and contact hazard			(3, 4)
	N,N,N',N'-Tetramethyl-p-phenylenediamine Dihydrochloride	Organic #2, Orange					
	Tetramethylsilane	Organic #3, Red		Flammability hazard			(6)
	Tetraphenylarsonium Chloride	Organic #3, Blue		Health hazard			(3)
	Tetrazolium Blue (Chloride)	Organic #3, Blue		Health hazard			(3)
	Thallic Nitrate, Trihydrate	Inorganic #3A, Yellow		Health reactivity and contact hazard			(4, 5)
	Thallium	Inorganic #1, Blue		Health hazard, combustible dust			(3)
	Thiamine Hydrochloride	Organic #1, Orange					
	Thermite Igniting Mixture	Inorganic #4, Red		Contains Fe_2O_2 and Al; flammable; burning difficult to stop once started (fireproof storage)			(6)
	Thioacetamide	Organic #2, Blue		Health hazard			(2, 3)
	2-Thiobarbituric Acid	Organic #1, Orange					
	Thionin	Organic misc., Orange					
	Thionyl Chloride	Inorganic #6A, White		Health hazard, reacts with moisture in the air, contact hazard			(3, 4, 5)
	Thiosemicarbazide, Powder	Organic #2, Blue		Health hazard			(3)
	Thiourea	Organic #2, Blue		Health hazard			(3)

	Thorin	Organic # Blue		Health hazard			(3)
	Thorium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Thorium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health hazard			(3)
	Thymol Blue	Miscellaneous, Orange					
	Thymol Iodide	Organic #8, Orange					
	Thymolphthalein	Organic Misc., Orange					
	Thyroxine	Miscellaneous, Orange					
	Tin, metal	Inorganic #1, Orange		Combustible as dust			
	Tin, 10,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Tin, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Titanium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, White		Health and contact hazard			(3, 4)
	Titanium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, Orange					
	Titanium Dioxide (Titanium Oxide)	Inorganic #4, Orange		Combustible; many reactions may cause fire and explosion; store under inert gas			(5, 6)
	Titanium Tetrachloride	Inorganic #2A, White		Health and contact hazard			(3, 4)
	Titanium Trichloride	Inorganic #2, Red		Flammable and contact hazard			(4, 6)
	Titanium, metal	Inorganic #1, Red		Combustible as dust			(6)
	o-Tolidine Dihydrochloride	Organic #3A, Blue		Health and contact hazard			(3, 4)
	Toluene	Organic #3B, Red		Flammable; vapor-air mixtures explosive (fireproof storage), keep separate from H_2SO_4			(2, 3, 4, 6)
	Toluene Diisocyanate	Organic #5B, Blue		Health and contact hazard			(3, 4)
	p-Toluenesulfonic Acid, Monohydrate, Crystal	Organic #1, White		Contact hazard			(4)
	p-Toluenesulfonyl Chloride	Organic #1, White		Contact hazard			(4)
	o-Toluidine	Organic #3A, Red		Health and contact hazard			(3, 4)
	Tributylamine	Organic #3A, Red					

	Tributyl Phosphate	Organic #3, Orange					
	Tricane Methane Sulfonate	Organic #2					
	Trichloroacetic Acid	Organic #1, White		Health and contact hazard			(3, 4)
	Trichlorobenzene	Organic #4, Orange		Health hazard			(3)
	Trichloroethane	Organic #4, Orange		Health hazard			(2, 3)
	Trichloroethylene	Organic #4, Blue		Health hazard			(2, 3)
	Trichlorotrifluoroethane (CFC)	Organic #4, Orange		CFC			
	Tricresyl Phosphate	Organic #8, Orange					
	Triethanolamine	Organic #2, Orange					
	Triethylamine	Organic #2, Red		Flammability and contact hazard			(4, 6)
	Triethylene Glycol	Organic #2, Orange					
	Triethylenetetramine	Organic #2, White		Contact hazard			(4)
	Trifluoroacetic Acid	Organic #1, White		Health and contact hazard			(3, 4)
	Trifluoroacetic Anhydride	Organic #1B, White Stripe		Health and contact hazard			(3, 4)
	4,4,4-Trifluoro-1-(2-thienyl)-1,3-butanedione	Organic #4, Orange					
	Trimethylpentane	Organic #3, Red		Flammable			(6)
	2,4,4-Trimethyl-1-pentene	Organic #3A, Red		Flammable			(6)
	2,4,6-Trimethylpyridine	Organic #3A, Red					
	2,4,6-Trinitrobenzenesulfonic Acid, Trihydrate	Organic #1, Red		Flammable			(6)
	Trioctylphosphine Oxide	Organic #2A, Orange					
	Triphenylphosphine	Organic #8, Orange					
	Triphenyl Tetrazolium Chloride	Miscellaneous, Orange					
	TRIS (Base)	Organic #3A, Orange					
	TRIS Hydrochloride	Organic #3A, Orange					
	Trisodium Phosphate	Inorganic #2, White		Separate from strong acids, contact hazard			(4, 5)
	Triton X-100	Organic #2A, Orange					
	Trolamine	Organic #2A, Orange					
	Tumreric Powder	Organic #2, Orange					
	Tungsten, metal	Inorganic #1, Orange		Dust is flammable			(6)
	Tungstic Acid	Inorganic #9, Orange					

	Turpentine	Organic #2, Red		Combustible (fireproof storage, separate from oxidants)			(4, 6)
	Tween 20	Organic #3A, Orange					
	Tween 80	Organic #3A, Orange					
	Tyrosine	Organic #2A, Orange					
	Ultramarine Blue	Miscellaneous, Orange					
	Uranium	Inorganic #1, Blue		Radioactive			(3)
	Uranyl Nitrate	Inorganic #3, Yellow		Radioactive			(5)
	Urea	Organic #2, Orange					
	Urethane (Ethyl Carbamate)	Organic #2, Blue		Health hazard			(2, 3)
	Uric Acid	Organic #2, Orange					
	Vanadium, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Vanadium, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Vanadium Pentoxide	Inorganic #4, Blue		Health hazard			(3)
	Vanillin	Organic #2, Orange					
	Vegetable Oil	Organic #2, Orange					
	Vinyl Chloride	Organic #4, Red		Flammable, health and contact hazard			(2, 3, 6)
	Water	Misc., Orange					
	Wood's Alloy, Sticks	Inorganic #1, Blue		Health hazard			(3)
	Woods' metal	Inorganic #1, Orange		Contains bismuth, lead, tin, cadmium			(3)
	Wright's Stain Solution	Miscellaneous, Red		Flammable			(6)
	Xanthen-9-ol	Organic #2A, Orange					
	Xylene	Organic #3, Red		Combustible; above 81° F explosive vapor air mixtures (fireproof storage)			(3, 6)
	Xylene Cyanol FF	Organic #2A, Orange					
	Xylene Orange	Organic misc., Orange					
	Xylose	Organic misc., Orange					
	Yeast	Miscellaneous, Orange					
	Yttrium	Inorganic #1, Blue					

	Zenker's Fluid	Inorganic #2, Blue		Contains mercuric chloride, potassium dichromate, sodium sulfate and acetic acid, health and contact hazard			(3, 4)
	Zeolite	Inorganic #4, Orange					
	Zinc, Shot (see Zinc Metal)	Inorganic #1, Orange					
	Zinc, Sticks (see Zinc Metal)	Inorganic #1, Orange					
	Zinc, Powder (see Zinc Metal)	Inorganic #1B, Red Stripe		Flammable			(6)
	Zinc, DILUT-IT Analytical Concentrate, Standard, 1g Zn^{2+}	Inorganic #1, White		Contact hazard			(4)
	Zinc, 10,000 μg/mL (1.00% w/v)	Inorganic #1, Blue		Health hazard			(3)
	Zinc, 1,000 μg/mL (0.10% w/v)	Inorganic #1, White		Contact hazard			(4)
	Zinc Acetate	Inorganic #2, Orange					(3)
	Zinc Bromide	Inorganic #6a, White					
	ZInc Carbonate	Inorganic #2, Orange		Contact hazard			(4)
	Zinc Chloride	Inorganic #2, White		Health and contact hazard			(3, 4)
	Zinc Nitrate	Inorganic #3, Yellow		Enhances combustion of other substances, reactive, contact hazard			(3, 4, 5)
	Zinc Oxide	Inorganic #4, Orange					
	Zinc Stearate	Inorganic #2, Orange					
	Zinc Sulfate	Inorganic #2, Orange					
	ZInc Sulfide	Inorganic #5, Orange					
	Zinc metal	Inorganic #1, Red stripe		Combustible as dust (fireproof storage separated from oxidants)			(3, 6)
	Zirconium	Inorganic #1, Orange					
	Zirconium Nitrate	Inorganic #3, Yellow		Reactive			(5

Section 6
Resources

Laboratory Resource Lists

■ Vendor Information *(not all-inclusive; not a product endorsement):*

- Ace Glass Inc., (microscale glassware), PO Box 688 Vineland, NJ 08362-0688, Phone: 1-800-223-4524 and FAX 1-800-543-6752.
- Advanced Environmental Recycling Corp., (mercury recycling for a fee), 1-800-554-2372.
- Baker, J.T., (lab equipment and chemicals, safety stickers), 1-908-859-2151.
- Bethlehem Resource Recovery Division, (mercury recycling for a fee), 610-838-7034.
- BFI- Medical Waste Systems, (bio-hazardous waste disposal), 425-814-2244.
- Chemglass Inc., (glassware and microscale glassware), Vineland, NJ, Phone: 1-800-843-1794 and FAX 1-800-922-4361.
- Consolidated Disposal Services, Inc., (disposal of biohazardous waste), Phone: 1-509-754-2468.
- Corning Inc., (lab equipment and microscale glassware), Julie Arnautou, sales representative, Phone: 1-800-222-7740 and FAX 1-607-974-0345.
- DFG Mercury Inc., (mercury recycling free in large quantities), Phone: 1-847-869-7800 and FAX 1-847-869-2531
- EMED Co., Inc., (safety signs), Phone: 1-800-442-3633.
- H-B Instrument Company, (non-mercury and mercury thermometers), FAX 610-489-9100
- Kontes, Glass Company, Phone: 1-800-223-7150 and FAX 1-609-692-3242.
- Lab Mart, J&H Berge, Inc., (lab instruments), Phone: 1-800-684-1234 and FAX 1-908-561-3002.
- Pope Scientific Inc., (distillation equipment), Phone: 1-414-268-9300
- Lab Safety Supply, (safety equipment), Phone: 1-800-356-0783 and FAX 1-800-543-9910.
- Safety Storage Inc., (safety storage containers, cabinets and units), Terry Hatfield, Phone: 1-800-344-6539 and FAX 1-831-637-7405.
- Ultratech International Inc., (drain covers and spill equipment), Phone: 1-800-353-1611 and FAX 1-904-292-1325.

■ Waste Exchanges

- Imex, Phone 1-206-296-4899 and FAX 1-206-296-3997 and website http://www.metrokc.gov/hazwaste/imex/

- Portland Chemical Consortium (PCC), Phone 1-800-547-8887 and FAX 1-503-725-3888 and website http://www-adm.pdx.edu/user/pcc/default.htm

■ General Reference Information:

- American Chemical Society, *Laboratory Waste Management, A Guidebook*, ISBN 0-8412-2849-3 Washington D.C., 1994.
- American Chemical Society, *Safety in Academic Chemistry Laboratories*, ISBN 0-8412-1763-7, 1991.
- Battele, *Laboratory Waste Minimization and Pollution Prevention*
- Armour, M.A., *Hazardous Laboratory Chemicals Disposal Guide*, 2nd edition, Lewis Publishers, Inc., Chelsea, Michigan, 1996. (ISBN 1-56670-108-2) (Note: some treatment methods cannot be done in the State of Washington, call Dept. of Ecology with questions)
- Fawcett, H.H. and W. S. Wood, *Safety and Accident Prevention in Chemical Operations*, 2nd edition, Wiley-Interscience, New York, 1982.
- Flury, Patricia A., *Environmental Health and Safety in the Hospital Laboratory*, Charles C. Thomas Publisher, Springfield IL, 1978.
- Green, Michael E. and Turk, Amos, *Safety in Working with Chemicals*, Prentice-Hall Englewood Cliffs NJ, 1978.
- Kaufman, James A., *Laboratory Safety Guidelines*, Dow Chemical Co., Box 1713, Midland, MI 48640, 1977.
- National Institutes of Health, *NIH Guidelines for the Laboratory use of Chemical Carcinogens*, NIH Pub. No. 81-2385, GPO, Washington, DC 20402, 1981.
- National Research Council, *Prudent Practices in the Handling and Disposal of Chemicals*, National Academy Press, Washington, DC, 1995.
- Renfrew, Malcolm, Ed., *Safety in the Chemical Laboratory*, Vol. IV, J. Chem. Ed., American Chemical Society, Vineland, NJ, 1981.
- Steere, Norman V., Ed., *Safety in the Chemical Laboratory*, J. Chem. Ed. American Chemical Society, Easlon, PA, 18042, Vol. I, 1967, Vol. II, 1971, Vol. III 1974.
- Steere, Norman V., *Handbook of Laboratory Safety*, the Chemical Rubber Company, 1971 Boca Raton, FL.
- Young, Jay A., Ed., *Improving Safety in the Chemical Laboratory*, John Wiley & Sons, Inc. New York, 1987.

■ Hazardous Substances Information:

- American Conference of Governmental Industrial Hygienists, *Threshold Limit Values for Chemical Substances and Physical Agents,* 1330 Kemper Meadow Drive Cincinnati, OH 45240-1634 (latest edition).
- *Annual Report on Carcinogens*, National Toxicology Program U.S. Department of Health and Human Services, Public Health Service, U.S. Government Printing Office, Washington, DC, (latest edition).
- *Best Company, Best Safety Directory*, Vols. I and II, Oldwick, N.J., 1981.
- Bretherick, L., *Handbook of Reactive Chemical Hazards*, 4th edition, Woburn, MA, 1991.

- Bretherick, L., *Hazards in the Chemical Laboratory*, 4th edition, Society of Chemistry, Port Washington, NY, 1986.
- *Code of Federal Regulations, 29 CFR part 1910 subpart Z*. U.S. Govt. Printing Office, Washington, DC 20402 (latest edition).
- IARC *Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man*, World Health Organization Publications Center, 49 Sheridan Avenue, Albany, New York 12210 (latest editions).
- NIOSH *Pocket Guide to Chemical Hazards*. NIOSH Pub. No. 85-114, U.S. Government Printing Office, Washington, DC, (latest edition).
- *NIOSH/OSHA Occupational Health Guidelines*, NIOSH Pub. No. 81-123 U.S. Government Printing Office, Washington, DC, 1981 (with subsequent supplements for chemical hazards).
- Patty, F.A., *Industrial Hygiene and Toxicology*, John Wiley & Sons, Inc., New York, NY (three volumes).
- *NIOSH Registry of Toxic Effects of Chemical Substances*, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, Revised Annually, for sale from Superintendent of Documents U.S. Govt. Printing Office, Washington, DC 20402.
- *The Merck Index: An Encyclopedia of Chemicals, Drugs and Biologicals*. Merck and Company Inc. Rahway, N.J., 1996 (or latest edition).
- Lewis, Richard and Saxis, NI, *Dangerous Properties of Industrial Materials*, 9th edition, John Wiley and Sons, NY., 1995.
- Sittig, Marshall, *Handbook of Toxic and Hazardous Chemicals and Carcinogens*, 3rd edition, Noyes Publications, Park Ridge, NJ, 1991.

■ Information on Ventilation:

- American Conference of Governmental Industrial Hygienists Industrial Ventilation, 23rd edition, 1330 Kemper Meadows Drive, Cincinnati, OH 45240-1634, 1998.
- American National Standards Institute, Inc. American National Standards *Fundamentals Governing the Design and Operation of Local Exhaust Systems* ANSI Z 9.2-1979 American National Standards Institute, N.Y. 1979.
- *Safety Standard for Laboratories in Health Related Institutions*, NFPA, 56c, 1980.
- Scientific Apparatus Makers Association (SAMA), *Standard for Laboratory Fume Hoods*, SAMA LF7-1980, 1101 16th Street, NW., Washington, DC 20036.
- Imad, A.P. and Watson, C.L. *Ventilation Index: An Easy Way to Decide about Hazardous Liquids*, Professional Safety pp 15-18, April 1980.
- National Fire Protection Association, *Fire Protection for Laboratories Using Chemicals* NFPA-45, 1982.
- *Fire Protection Guide on Hazardous Materials*, 7th edition, 1978.
- *National Fire Protection Association*, Batterymarch Park, Quincy, MA 02269.

■ Standards Organizations:

- American National Standards Institute (ANSI), 1430 Broadway, New York, NY 10018.

- American Society for Testing and Materials (ASTM), 1916 Race Street, Philadelphia, PA 19103. (Office of Management and Budget under control number 1218-0131.)
- State of Washington [Statutory Authority: Chapter 49.17 RCW. 90-17-051 (Order 90-10), § 296-62-40027, filed 8/13/90, effective 9/24/90.]

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- ***The Merck Index*****.** 12th ed., Rahway, New Jersey: Merck & Co., 1989
- Sittig, M., ***Handbook of Toxic and Hazardous Chemicals and Carcinogens***, 3rd ed., 1997
- State of Washington Department of Labor and Industries, ***Understanding "Right to Know", Chemical Hazard Communication Guidelines for Washington Employers*****.** P412-012-000, July 1996
- Washington State Department of Ecology, ***Chemicals of Special Concern in Washington State***, 92-66, July 1992
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- Washington State Department of Ecology, ***Domestic Sewage Exclusion*****,** A Technical Information Memorandum, Publication #94-136 (revised August 2001)
- Washington State Department of Ecology, ***Satellite Accumulation*****,** A Technical Information Memorandum, Publication #94-120