

Hazardous Materials and Laboratory Safety

Environmental Health and Safety
San José State University

Why Does it Matter?

- We highly encourage you to watch this video:
 - <http://www.youtube.com/watch?v=ALBWxGik64A>
- The video examines three university lab accidents, their consequences, and what should be done to prevent their reoccurrence.
- Case studies examined by the Chemical Safety Board:
 - UCLA
 - Criminal charges filed against UCLA and professor
 - Faced up to 4.5yrs jail \$1.5million fines
 - Settled 800hrs community service, \$10k fines
 - Dartmouth
 - Texas Tech

Hazardous Materials

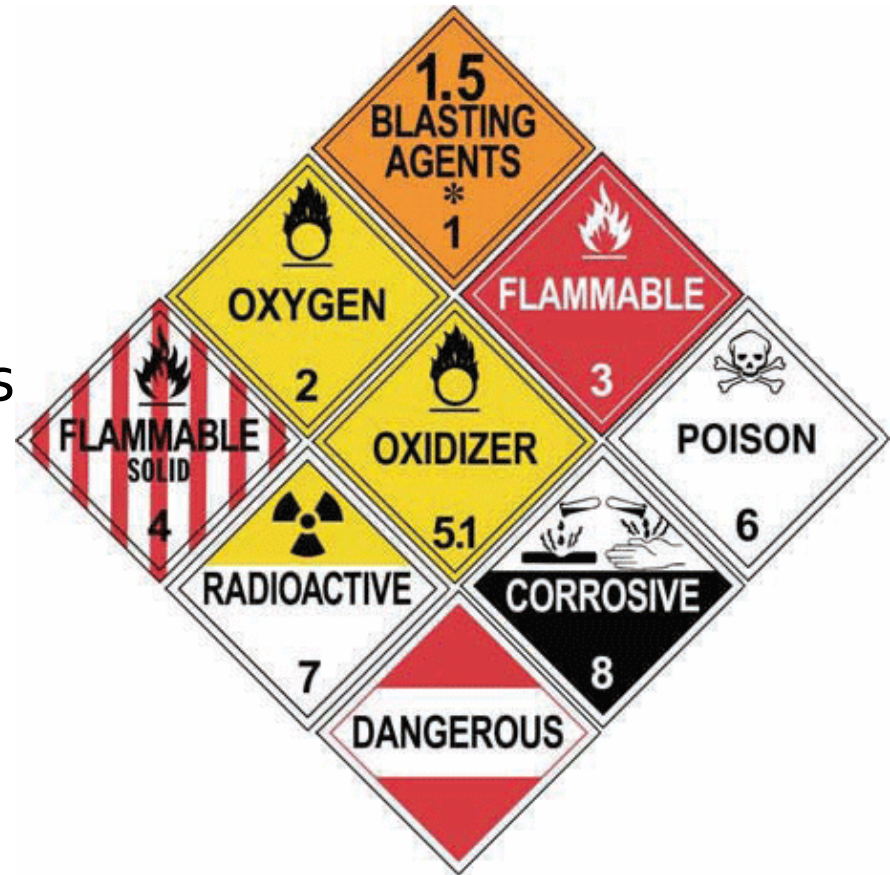
- What makes a material hazardous?
- In General, we abide by 4 hazardous classifications
 - Ignitability
 - Corrosivity
 - Reactivity
 - Toxicity

A Hazardous Material

- **Ignitability** - Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F).
- **Corrosivity** - Corrosive wastes are acids or bases (pH less than or equal to 2, or greater than or equal to 12.5) that are capable of corroding metal containers, such as storage tanks, drums, and barrels. Battery acid is an example.
 - Why 2 and not 2.5 to mirror the 12.5 on the basic side?
- **Reactivity** - Reactive wastes are unstable under "normal" conditions. They can cause explosions, toxic fumes, gases, or vapors when heated, compressed, or mixed with water. Examples include lithium-sulfur batteries and explosives.
- **Toxicity** - Toxic wastes are harmful or fatal when ingested or absorbed (e.g., containing mercury, lead, etc.). When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water.

DOT Hazardous Materials

- The Department of Transportation further classifies Hazardous Materials into 9 categories
- These are usually represented as placards on packaging and transport vehicles
- If we ever ship hazardous materials, we have to follow these standards



DOT Hazard Classification

Hazard Class 1: Explosives	1.1 mass explosion hazard 1.2 projectile hazard 1.3 minor blast/projectile/fire 1.4 minor blast 1.5 insensitive explosives 1.6 very insensitive explosives
Hazard Class 2: Compressed Gases	2.1 flammable gases 2.2 non flammable compressed 2.3 poisonous
Hazard Class 3: Flammable Liquids	Flammable (flash point below 141°) Combustible (flash point 141°-200°)
Hazard Class 4: Flammable Solids	4.1 flammable solids 4.2 spontaneously combustible 4.3 dangerous when wet
Hazard Class 5: Oxidizers and Organic Peroxides	5.1 Oxidizer 5.2 Organic Peroxide
Hazard Class 6: Toxic Materials	6.1 Material that is poisonous 6.2 Infectious Agents
Hazard Class 7: Radioactive Material	Radioactive I Radioactive II Radioactive III
Hazard Class 8: Corrosive Material	Destruction of the human skin Corrode steel at a rate of 0.25 inches per year
Hazard Class 9: Miscellaneous	A material that presents a hazard during shipment but does not meet the definition of the other classes

Hazard Communication

- Now that we know what constitutes a hazardous material, how do we communicate those hazards?
- Required to comply with OSHA Hazard Communication Standard (Hazcom)
 - Chemical Labeling
 - MSDS/SDS
- Globally Harmonized System (GHS) amendments to Hazcom Standard
 - 9 pictograms

Pictograms

Health Hazard



- Carcinogen
- Mutagenicity
- Reproductive toxicity
- Respiratory sensitizer
- Target organ toxicity
- Aspiration toxicity

Flame



- Flammables
- Pyrophorics
- Self-heating
- Emits flammable gas
- Self-reactives
- Organic peroxides

Exclamation Mark



- Irritant (skin and eye)
 - Skin sensitizer
- Acute toxicity (harmful)
 - Narcotic effects
- Respiratory tract irritant
- Hazardous to ozone layer (non-mandatory)

Pictograms

Gas Cylinder



- Gases under pressure

Corrosion



- Skin corrosion/burns
 - Eye damage
- Corrosive to metals

Exploding Bomb



- Explosives
- Self-reactives
- Organic peroxides

Pictograms

Flame Over Circle



- Oxidizers

Environment*



- Aquatic toxicity

**under EPA jurisdiction*

Skull & Crossbones



- Acute toxicity (fatal or toxic)

Sample Label

Product Identifier

Pictograms



Hazard Statements

Signal Word

Precautionary Statements

Name, address and telephone number of the chemical manufacturer, importer or other responsible party

OXI252
(2-methyl kaboom)
CAS #: 111-11-11xx



Danger

- May cause fire or explosion; strong oxidizer
- Causes severe skin burns and eye damage

Keep away from heat. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Wear protective neoprene gloves, safety goggles and face shield with chin guard. Wear fire/flammable resistant clothing. Do not breathe dust or mists. Wash arms, hands and face thoroughly after handling. Store locked up. Dispose of contents and container in accordance with local, state and federal regulations.

First aid
IF ON SKIN, HAIR OR CLOTHING: Immediately rinse any contaminated clothing and skin with plenty of water before removing clothes. Wash contaminated clothing before reuse.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present. Continue rinsing.
IF INHALED: Remove person to fresh air and keep him or her comfortable.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call poison center.
SPECIFIC TREATMENT: Treat with doctor-prescribed burn cream.

Fire
In case of fire: Use water spray.
In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Great Chemical Company
55 Main Street, Anywhere, CT 064XX
Telephone: 888-777-8888

Labels

- Labels must be legible, in English, and prominently displayed on the container.
- Labels on incoming containers of hazardous chemicals must not be removed or defaced.



NFPA 704 Diamond Label

The system is intended to provide basic information to emergency personnel so they could evaluate what fire fighting techniques to employ when they enter a facility where hazardous materials are present.

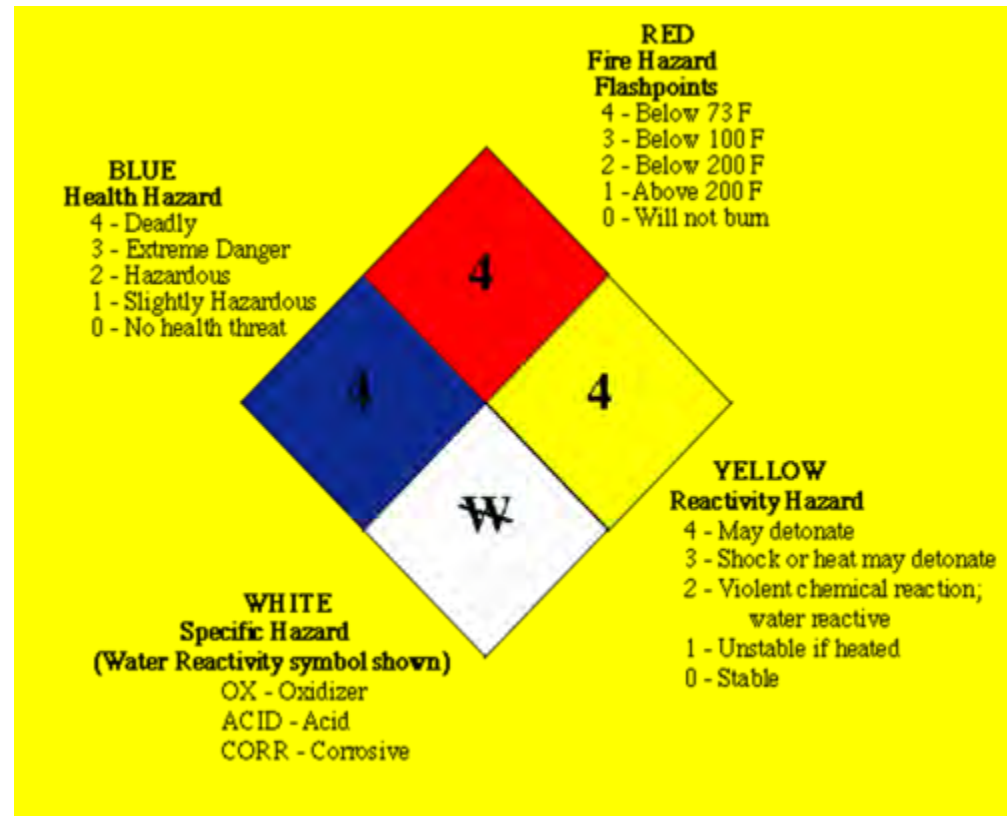
There are four categories of hazards identified by the NFPA system:

- Health
- Flammability
- Instability (Reactivity)
- Special/Specific Hazard



NFPA 704 Hazard Divisions

- Five divisions ranging from zero (no hazard) to four (severe hazard) indicate the degree of severity for each hazard numerically.
- The blue square indicates health hazard, the red square represents flammability, and the yellow square indicates instability.
- The fourth square represents a specific hazard, such as unusual reactivity with water.
- The usual symbol for alerting fire-fighting personnel to the possible hazard of using water is the letter W with a line through it.
- [Santa Clara Environmental Health also enforces Fire Code, so they expect to see this](#)



OSHA Labeling

Hazardous substances in the workplace must be labeled:

- **Identity** of the hazardous substance(s). The name of the substance must be spelled out in its entirety, and not by its empirical chemical formula, e.g. Sodium Chloride for NaCl.
- **Concentration** of the hazardous substance(s). The concentration may be expressed as in parts per million, percent or molarity.
- **Contain a statement of the hazardous property** (e.g. toxic, corrosive, acid, base, reactive, flammable).



Container Labels

- To Label or Not To Label?
- Portable containers into which hazardous substances are transferred from labeled containers, and which are intended *only for the immediate use* of the person who performs the transfer, are *not required to be labeled.*
- *Portable containers which are in use for greater than the day or shift must be labeled and capped.*



Storage and Handling

- We're building...
 - We've talked about what a hazardous material is and how to ID them
- Now we'll discuss how to store chemicals and how to safely handle them

Safety in the Lab Begins & Ends with Housekeeping



Pictures taken during County inspection



A Proper Container

Containers must be:

- In good condition;
- Compatible with the waste held;
- Kept closed except when adding or removing waste.
- Must be product-tight.

- 22 CCR §66262.34



Bad Examples of Chemical Containers



Secondary Containment

Secondary Containment is a liquid-tight barrier that will contain hazardous materials that are released from a primary storage container.

- Secondary containment is **required for the storage of all regulated hazardous materials**. Secondary containment for a **single** container will be **110 percent of the primary container**.
- Secondary containment for **multiple containers** will be **150 percent** of the largest container's volume or 10 percent of the aggregate volumes of all containers, whichever is greater.



Secondary Containment



Secondary Containment is necessary even when an experiment is underway.



These pictures are examples of no secondary containment, no labeling, poor housekeeping, and placement of containers too close to the counter's edge

Proper Use of Chemical Storage Containers

- Never use food containers for chemical storage.
- Make sure all containers are properly closed.
- After each use, carefully wipe down the outside of the container with a paper towel before returning it to the storage area. Properly dispose of the paper towel as a hazardous waste after use.
- Store bottles and containers in Secondary Containment, segregated by their compatibility.



**Secondary Containment is Good.
But are the chemicals compatible?**

Secondary Containment

- Do not store bottles on the bottom of storage cabinets.
- The cabinet bottom provides Secondary Containment for the stored containers.
- Containers placed in the bottom will displace and minimize secondary containment capacity.



Storage DOs

STORAGE

- Store chemicals inside a closeable cabinet or on a sturdy shelf with a front-edge lip to prevent accidents and chemical spills; a $\frac{3}{4}$ -inch front edge lip is recommended.



Storage Don'ts

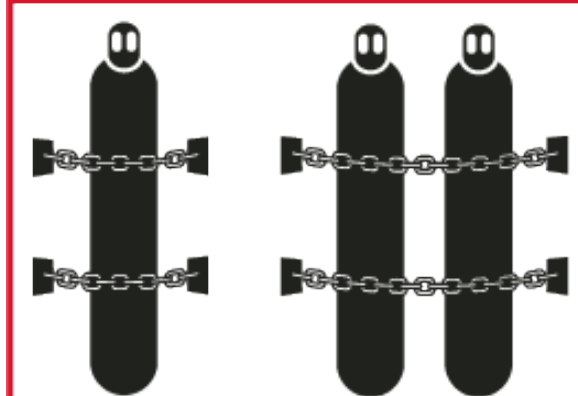
- Do not place heavy materials, liquid chemicals, and large containers on high shelves.
- Do not store chemicals on tops of cabinets.
- Do not store chemicals on the floor, even temporarily.
- Do not store items on bench tops and in laboratory chemical hoods, except when in use.
- Do not store chemicals on shelves above eye level.
- Do not store chemicals with food and drinks.



Compressed Gas Cylinder Storage

- Cylinders must be stored upright.
- Metal restraints at 1/3 AND 2/3 height of cylinder.
- Max of 2 cylinders per set of chains.
- Cylinder bench clamps are NOT allowed.
- Attach valve cap when compressed gas cylinder is not in service.

Restrain Cylinders



*Restrain no more than two cylinders in any restraint configuration

**Secure up to two cylinders with
TWO chains at 1/3 and 2/3 height**

Contact SOM Health and Safety Programs @ 723-0110



What is wrong with this picture?

Compressed Gas Cylinder Storage

- Label empty cylinders **"EMPTY"** and date the tag.
- Store empty cylinders separately from full cylinders.
- Always attach valve safety caps when storing or moving cylinders.
- Transport cylinders with an approved cart with a safety chain; never move or roll gas cylinders by hand.

**FULL
CYLINDER**

**EMPTY
CYLINDER**



Compressed Gas Cylinder Storage

- Store cylinders by gas type, separating oxidizing gases from flammable gases by either 20 feet or a 30-minute firewall that is 5 feet high.
- Well-ventilated - do not store in cold rooms!
- Separate from incompatibles and isolate from highly flammable materials (>20 ft)
- Signage - When storing flammable gases, post signs identifying flammable gas precautions (i.e., no smoking, no open flames).



Chemical Compatibility

- The next component of proper storage concerns compatibility
- Organize chemicals first by **COMPATIBILITY**—not alphabetic succession.
- Store alphabetically within compatible groups.



Compatibility Rules for Chemical Storage

Organics and Inorganics:

- Sort chemicals into organic and inorganic classes.
- Separate into the following compatible families...

- *School Chemistry Laboratory Safety Guide, October 2006, DHHS (NIOSH) Publication No. 2007-107*

<i>Inorganics</i>	<i>Organics</i>
1. Metals, Hydrides	1. Acids, Anhydrides, Peracids
2. Halides, Halogens, Phosphates, Sulfates, Sulfites, Thiosulfates	2. Alcohols, Amides, Amines, Glycols, Imides, Imines
3. Amides, Azides*, Nitrates* (except Ammonium nitrate), Nitrites*, Nitric acid	3. Aldehydes, Esters, Hydrocarbons
4. Carbon, Carbonates, Hydroxides, Oxides, Silicates	4. Ethers*, Ethylene oxide, Halogenated hydrocarbons, Ketenes, Ketones
5. Carbides, Nitrides, Phosphides, Selenides, Sulfides	5. Epoxy compounds, Isocyanates
6. Chlorates, Chlorites, Hydrogen Peroxide*, Hypochlorites, Perchlorates*, Perchloric acid*, Peroxides	6. Azides*, Hydroperoxides, Peroxides
7. Arsenates, Cyanates, Cyanides	7. Nitriles, Polysulfides, Sulfides, Sulfoxides
8. Borates, Chromates, Manganates, Permanganates	8. Cresols, Phenols
9. Acids (except Nitric acid)	
10. Arsenic, Phosphorous*, Phosphorous Pentoxide*, Sulfur	

Chemical Storage & Segregation

Chemical Category	Storage Consideration
Inorganic Acids	Store in an Acids or Corrosive Cabinet. Use secondary containment to separate from other acids and bases. (for example: organic acids, inorganic bases, oxidizing acids)
Organic Acids	Store in an Acids or Corrosive Cabinet and in secondary containment to separate from other acids and bases. If oxidizing acids are present move them to the flammables cabinet in secondary containment to separate from flammables.
Oxidizing Acids	Store in an Acids or Corrosive Cabinet. Use secondary containment to separate from other acids and bases. (for example: inorganic acids, inorganic bases) Remove ALL organic material from this cabinet.
Inorganic Bases	Store in a Bases or Corrosive Cabinet. Use secondary containment to separate from other acids and bases. (for example: inorganic acids, oxidizing acids)
Flammable and Combustible Liquids	Store in a Flammables Cabinet (preferably a metal, commercially manufactured cabinet designed for storage of flammables)
Gases	Gas cylinders need to be secured by two chains 1/3 and 2/3 of the way up the cylinder to prevent them from falling.
Organic Peroxides	This material is an organic oxidizer. Store by itself in secondary containment to separate from other organic and inorganic chemicals.
Oxidizers	Store in secondary containment to separate from other organic and inorganic chemicals.
Reactives (Water, Pyrophoric & Explosive Materials)	Due to the varying characteristics of these materials contact EHS for guidance.
Toxic and Environmentally Hazardous Chemicals	Store in separate Toxics storage area OR in separate secondary containment in a Flammables Storage Cabinet.

Safe Work Practices

The PI/Lab Supervisor

Has responsibility for the health and safety of laboratory personnel doing work in his/her laboratory.

- The PI/Laboratory Supervisor may delegate the safety duties for which he/she is responsible, but must make sure that any delegated safety duties are carried out.
- The PI/Laboratory Supervisor should train laboratory personnel under his/her supervision to work safely with hazardous chemicals and operations and maintain records of training.
- Maintain in functional working order appropriate personal protective equipment (e.g., gloves, goggles).
- Conduct periodic laboratory inspections and maintain records of inspections.

Safety Wear



- Eye or face protection should be worn continuously.
- Gloves should be worn which will resist penetration by the chemical being handled and which have been checked for pin holes, tears, or rips.
- Wear a laboratory coat or apron to protect skin and clothing from chemicals.
- Footwear should cover feet completely; no open-toed shoes.

Working with Acids

- **Store in an acid storage cabinet.**
- Segregate oxidizing acids from organic acids (see chart), flammables, and combustibles.
- Segregate acids from bases and active metals.
- Always carry acids in an acid bottle carrier when transporting.
- Know the location of acid or base spill neutralizing supplies in the building.
- Oxidizing acids can also present fire and explosion hazards if contacted with organic compounds or other oxidizable chemicals.

Strong Oxidizing Acids	Organic Acids
Chromic acids Hydrobromic acid Iodic acid Nitric acid Perchloric acid Sulfuric acid	Acetic acid Benzoic acid Formic acid Phenol Trichloroacetic acid Propionic acid Sulfamic acid Sulfanilic acid

Working with Oxidizers

- Oxidizers are corrosive and fire and explosion hazards.
- Avoid contact of these chemicals with organic compounds, flammables, combustibles and other oxidizable compounds.
- Keep away from reducing agents such as zinc, alkaline metals, and formic acid.
- **Store in glass or inert containers**, but do not cap with cork or rubber stopper.

Ammonium
dichromate

Ammonium
perchlorate

Ammonium
persulfate

Benzyl peroxide

Bromates, salts of

Calcium
hypochlorite

Ceric sulfate

Chlorates, salts of

Chromium trioxide

Ferric trioxide

Ferric chloride

Iodates, salts of

Iodine

Magnesium
perchlorate

Magnesium dioxide

Nitrates, salts of

Periodic acid

Potassium
dichromate

Peroxides, salts of

Potassium
permanganate

Potassium
ferricyanide

Sodium chlorite

Sodium bismuthate

Sodium nitrite

Sodium dichromate

Sulfates, salts of

Sodium perborate

Work Habits

- Never work alone in a science laboratory or storage area.
- Never eat, drink, smoke, chew gum or tobacco in a science laboratory or storage area.
- Do not store food or beverages in the laboratory environment.
- Never pipette by mouth.
- Wash hands before and after work in a science laboratory, and after spill cleanups.
- Restrain loose clothing (e.g. sleeves, full cut blouses, neckties, etc.) long hair and dangling jewelry.
- Never leave heat sources unattended (e.g. gas burners, hot plates, heating mantles, sand bathes, etc.)
- Do not store reagents and/or apparatus on lab bench, and keep lab shelves organized.
- Never place reactive chemicals (in bottles, beakers/flasks, wash bottles, etc.) near the edges of a lab bench.

Work Habits

- Use a fume hood when working with volatile substances.
- Never lean into the fume hood.
- Do not use the fume hood as a storage area.
- Obtain and read the Material Safety Data Sheets (MSDS) for each chemical before beginning any experiment.
- Analyze new lab procedures in advance to pinpoint hazardous areas.
- Analyze accidents for prevent repeat performances.
- Protection should be provided for not only the lab worker but also the lab partner working nearby.
- Do not mix chemicals in the sink drain.
- Always inform coworkers of plans to carry out hazardous work.
- Conduct regular in-house safety and health inspections with an emphasis on improvement rather than guilt.

Basic Laboratory Safety Guidelines

- Keep eye washes, emergency showers, fire extinguishers and alarm pull-boxes free from obstruction.
- Never eat, drink, smoke, chew gum, apply cosmetics, etc. in a laboratory.
- Prior to working with a chemical, always read the Material Safety Data Sheet.
- Keep emergency exits and all corridors free from obstruction.
- Do not work alone. Ensure that you have the approval of your PI/Lab Supervisor to be in the lab.
- Post Emergency Notification Instructions in the area.

Minor Chemical Splash on Skin

- Remove any contaminated clothing and use a sink to wash the affected area.
- Continue to flood the affected body area in COLD water for at least 15 minutes.
- Get medical attention as soon as possible if symptoms persist.
- DO NOT attempt to neutralize the chemical in situ (in place).

Large Chemical Splash on Skin

- Call the UPD Police at 9-1-1 from a campus phone for medical assistance.
- Get to the safety deluge shower instantly.
- Quickly remove all contaminated clothing **WHILE USING THE SHOWER!**
- Flood the affected body area in COLD water for at least 15 minutes.
- DO NOT attempt to neutralize the chemical in situ (in place).

Emergency Contact Numbers

- Pull the nearest fire alarm.
- Call SJSU UPD at 9-1-1 from campus phone.
- Call 408-924-2222 from cell or off campus phone, and
- Report the exact location of the incident.

"ACE" Fire Plan

ALERT, CONFINE and EVACUATE

Alert:

- Pull the nearest fire alarm
- Call UPD at 9-1-1 from campus phone.
- 408-924-2222 from cell or off campus and
- Report the exact location of the fire.

Confine & Evacuate

- **Confine:**
Close all doors in the fire area to confine fire and smoke.
- **Evacuate:**
Evacuate the building immediately and, once outside, report to your supervisor.

Waste Stream

- Ideally, we want to maintain a zero waste stream for hazardous materials
- But that's not always possible
- Unless the hazardous characteristics of the material have been neutralized as a result of our use of the chemical, we'll have to dispose of as hazardous waste
- Hazardous waste: cradle to grave
 - We are always liable for what we generate

Waste Minimization

- Source Reduction
 - Use less toxic materials if possible
 - Don't over order
- Process Improvement
 - Use smaller sample sizes if possible
- Reuse
- Recycle

Donations

Cost \$6,000
to dispose

- Free stuff is always great but...
- This is an instance where we should look a gift horse in the mouth
- The donation may come with other chemicals that are unlabeled and/or acutely hazardous
- Expensive to dispose and puts everyone at risk



unlabeled



Hazardous Waste

- Hazardous Waste is tightly regulated
- Have to follow all storage and compatibility requirements
- Have to follow additional labeling requirements
- All Hazardous Waste must be manifested and reported to the State
- Must be disposed of through licensed haulers and disposal facilities

Waste Accumulation Container Label

Labels

Information must be clearly marked on each point of generation accumulation container:

- The accumulation start date for the waste (i.e., the date waste was first placed in the container);
- The words "HAZARDOUS WASTE";
- The composition of the waste;
- The physical state of the waste (i.e., solid or liquid);
- The hazardous properties of the waste (i.e., flammable, corrosive, reactive, toxic);
- The name of the waste generator;
- The address of the waste generator;
- Generator ID
- Within 3 days of reaching the 55 gallon or one quart point of generation accumulation limit, the container must be marked with the date the quantity limit was reached.
- 22 CCR §66262.34

Hazardous Waste Label

HAZARDOUS WASTE WORKPLACE ACCUMULATION IDENTIFICATION		
SAN JOSE STATE UNIVERSITY ONE WASHINGTON SQUARE SAN JOSE, CA 95192-0222		
EPA I.D.#CAT080031206		
Container I.D. # _____		
Person to contact re information on tag: _____		Phone _____
Waste Location: Department _____	Building _____	Room _____
Accumulation start date _____		
GENERAL DESCRIPTION: _____ _____ _____ _____	<input type="checkbox"/> SOLID	<input type="checkbox"/> FLAMMABLE
	<input type="checkbox"/> LIQUID	<input type="checkbox"/> CORROSIVE
		<input type="checkbox"/> TOXIC/POISON
	pH _____	<input type="checkbox"/> OXIDIZER
		<input type="checkbox"/> EXTREMELY HAZARDOUS
CONTENTS:		%
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
HANDLE WITH CARE!		
NOTE: Hazardous Waste cannot be accumulated for more than 270 days (9 months).		

Universal Hazardous Waste Materials

- Fluorescent Lamp Bulbs and ballasts
- Batteries, all kinds, alkaline, lead-acid automotive, NiCad, lithium & NiMh.
- Mercury Switches
- Electronic Wastes
- Aerosol spray paints.

*Accumulation
Containers must have
a lid and label!*

**UNIVERSAL
WASTE**

CONTENTS _____

ACCUMULATION START DATE _____

SHIPPER _____

ADDRESS _____

CITY, STATE, ZIP _____

Proper Disposal of Chemical Waste

- *Do not pour chemicals down the drain.*
- Do not intentionally evaporate chemicals, such as in a laboratory hood.
- Do not intentionally treat hazardous waste, such as neutralizing an acid with a base.
- Contact the Department Laboratory Tech responsible for hazardous waste disposal in your building for waste pickup and disposal.



Storing Chemical Waste

- Store all waste in containers that are in good condition and are compatible with their contents.
- Clearly and permanently label each container as to its contents and label as hazardous waste.
- Store waste in a designated area away from normal laboratory operations and to prevent unauthorized access.



Storing Chemical Waste

- Store waste bottles using a method of Secondary Containment.
- Keep materials segregated by compatibility.
- Store waste bottles away from sinks and floor drains.
- Do not completely fill waste bottles; leave several inches of space at the top of each waste container.
- Cap all waste bottles.




Do not intentionally pour chemicals down the drain.



Lab Safety Inspections

- Safety Inspection reports generated by the Environmental Health and Safety office are maintained by Environmental Health and Safety for 6 years.
- Safety Inspection reports generated by the laboratory are maintained within the responsible department for 6 years.

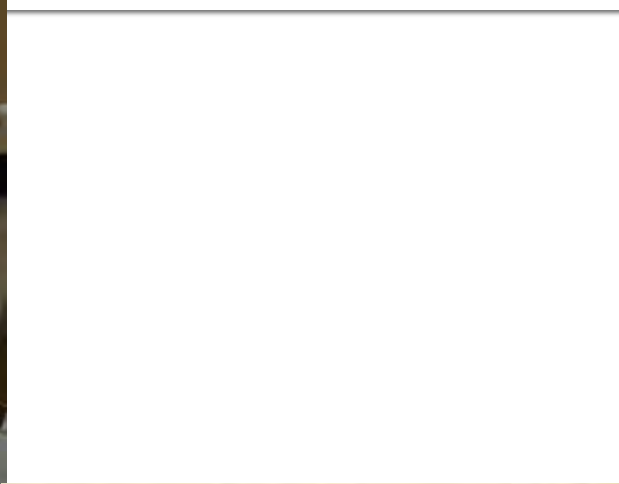
			Occupational Exposure to Hazardous Chemicals in Laboratories	
LABORATORY INSPECTION CHECKLIST¹²				
Building & Room:			Inspected By:	
PI/Area Supervisor:			Date:	
All laboratory spaces containing hazardous materials must be inspected at least semiannually. For each item check Yes, No, or N/A. Be sure to retain all documentation regarding inspections, including findings <i>and</i> corrective actions taken for any "No" responses, for a minimum of 3 years.				
Y	N	N/A	GENERAL SAFETY	
			Area around fire extinguishers, pull alarms, emergency showers, & electrical panels kept clear?	
			Eighteen-inch vertical clearance maintained below fire sprinkler heads (e.g., over shelves)?	
			Cabinets, furniture, and equipment taller than 4 feet braced or anchored?	
			Food and drink stored and consumed away from toxic and infectious materials?	
			Refrigerators/freezers labeled either "Food & Drink Only" or "No Food & Drink"?	
			Extension cords and power strips not daisy chained and no permanent extension cords in use?	
			No exposed wiring or damaged electrical cords?	
			Floors are clear and aisles and adjacent hallways unobstructed?	
			Floors dry & free of slip hazards; bench tops (including hoods) reasonably organized and clean?	
			HAZARDOUS MATERIALS & WASTES	
			All containers, including non-hazardous chemicals and wastes, legibly labeled with the full chemical or trade name (note: abbreviations/formulas are not adequate)?	
			All hazardous materials & oil pumps stored in secondary containment free of spilled material?	
			Incompatible materials properly segregated?	
			Chemical & waste containers in good condition & kept closed except during use (no funnels)?	
			Flammable liquids (including flammable waste & glacial acetic acid) stored in flammable liquid storage cabinets? <i>Note:</i> Up to 10 gallons per control area (NOT per individual lab) may be stored outside of cabinets.	
			Flammables that are refrigerated are placed in explosion-proof or flammables refrigerators only?	
			No hazardous materials near sinks or drains unless secondary containment is provided?	
			Lab practices minimize volatilization (i.e. traps used, open-container procedures minimized)?	
			"Chemical Waste Compliance" poster posted in lab where hazardous waste is accumulated?	
			Storage in fume hoods minimized and sashes kept closed when not in use?	
			Emergency contacts, chemical storage maps, & chemical inventory are current?	
			Hazardous material spill cleanup kits & first aid kits available (recommended)?	
			All hazardous wastes collected in compatible containers with completed waste tags & kept for no longer than 9 months from "accumulation date" on waste tag?	
			Biohazardous waste in red bags with proper signage in hard sided, closed secondary containment with biohazard symbols on four sides and top?	
			COMPRESSED GASES	
			Cylinders listed on chemical inventory, positioned so that contents label is visible, & stored in a dry, well-ventilated location protected from heat sources?	
			Cylinders > 26" tall secured to a rigid structure at 1/3 and 2/3 height with metal chains & a maximum of 2 cylinders per pair of chains (one restraint for cylinders <26" and dewars)?	
			Cylinder valves closed and valve caps in place when cylinders not in use?	

¹² http://www.stanford.edu/dept/EHS/prod/researchlab/lab/laboratory_inspections.html
SJSU_Chemical Hygiene Plan_2012-0625.doc

Area Inspected: _____

Explain any problems found and corrective actions taken in the "Comments" section.
THIS FORM DOES NOT APPLY TO UNDERGROUND TANKS - Maintain completed form at Safety Station.

What is wrong with these pictures?



What is wrong with these pictures?



Take Action ...

- Lab Rules and Emergency Contacts are Posted
 - Specify PPE for each laboratory.
 - Faculty, staff and students are properly trained.
 - Waste Accumulation Areas are Inspected monthly.
 - Containers are in good condition, properly labeled and stored.
- Ensure Emergency Equipment is in available and functional.
 - Follow the Chain of Command to Notify the Department Chair and Dean's Office of Accidents and Spills.

The End

Contact SJSU Environmental Health and Safety
Questions, Guidance, Training.

David Krack Ext. 4-1978
Director of Environmental Health and Safety

Matt Nymeyer (4-1969)
Chandra Gowda (4-2152)
Environmental Compliance Specialists