Fact Sheet

OSU
ENVIRONMENTAL
HEALTH & SAFETY

Safety Instruction

Chemical Storage Guidelines

General Storage Requirements

- Always review a chemical's MSDS/SDS for proper storage procedures.
- Do not store glass chemical containers on the floor (without secondary containment) or window ledges.
- Chemical storage areas should be well lit, appropriately ventilated and kept away from aisles, exits, and heat.
- Minimize storage on the lab bench, in fume hoods, and other work areas.
- Use first-in, first-out system (oldest chemicals first); to avoid degradation of older chemicals and their containers.
- Inspect stored chemicals often for expiration, deterioration and chemical integrity.

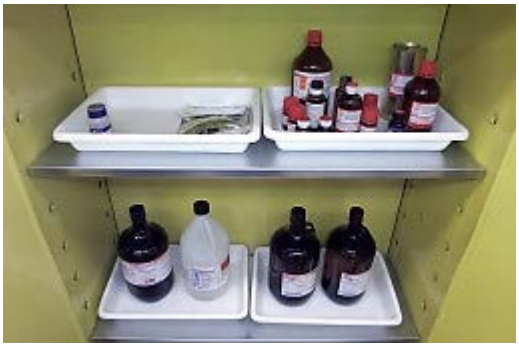
Storage Shelves/Cabinets

- Ensure chemical storage shelves are securely fastened to the wall and have lips or other suitable methods to prevent bottles from falling in the event of an earthquake.
- Avoid storing all chemicals above shoulder height. Large containers (1 gal or larger), liquids, and corrosive materials should be stored no higher than eye level.
- Do not overcrowd shelves.
- Flammables (in excess of 10 gal) must be stored in a flammable storage cabinet.
- Label chemical storage cabinets according to the type of chemical family or hazard classification found there (Acid Storage, Solvent Storage, etc.).

Storage in Refrigerators and Freezers

- Never store chemicals in office, domestic, or personal refrigerators; food and chemicals should never be stored together.
- When storing flammables in refrigerator, use an approved explosion proof or flammable storage refrigerator only.
- Label all refrigerator/freezers as to intended use.
- Frequently inventory materials stored in refrigerator/freezers and defrost occasionally to prevent chemicals from becoming trapped in ice formations.

Secondary Containment



- Use secondary containment, such as polyethylene or stainless steel trays, to separate incompatible chemicals stored in the same area and to provide spill containment.
- Provide secondary containers for storage of solvents and concentrated acids and bases.
- Use secondary containers during storage of all hazardous chemicals on the floor.

Storage of Hazardous Waste

- Minimize storage of hazardous waste.
- Store hazardous waste using the same guidelines as you would for storing chemical containers; use secondary containment, ensure the container is closed when not in use, and ensure proper labeling of the waste.

- If you no longer need a chemical, rather than keeping it stored, dispose of it properly (e.g. as hazardous waste) or follow the chemical reuse guidelines.
- Maximum storage times:
  - When storing untreated chemicals that degrade to unstable forms (e.g. peroxide formers such as ethyl ether), limit maximum storage time to one year from purchase or six months from first use. Note date received/date opened on such materials.
  - For other hazardous chemicals, use manufacturer's recommended storage time (if there is one) or other indications of degradation (e.g. discoloring of liquids).
- Expired chemicals should not be stored or used in laboratories and should be relinquished to EH&S for disposal.

Segregating Hazardous Chemicals

Store chemicals by hazard classification; avoid storing chemicals alphabetically unless they are compatible or already separated into appropriate hazard classes - this ensures that incompatible chemicals are segregated.

Accidental contact between incompatible chemicals can result in a fire, an explosion, the formation of highly toxic and/or flammable substances, or other potentially harmful reactions. If incompatible chemicals must be stored in the same cabinet, be sure to provide physical segregation (secondary containment).

Class of Chemicals	Recommended Storage Method	Examples	Incompatibles
Corrosives - Inorganic (Mineral) Acids	Store in a corrosive storage cabinet or in secondary containment	Hydrochloric acid, sulfuric acid, hydrofluoric acid, phosphoric acid	Bases and cyanides
Corrosives – Organic Acids	Store in a corrosive storage cabinet or in secondary containment	Acetic acid, trichloroacetic acid, lactic acid	Bases and cyanides
Corrosives - Bases	Store in a corrosive storage cabinet or in secondary containment	Ammonium hydroxide, sodium hydroxide	Acids
Explosives	Store in secure location away from all other chemicals	Acetone Peroxide, Trinitrobenzene	Flammable liquids, oxidizers, acids and bases
Flammable	Store in flammable storage cabinet (in excess of 10 gal) within secondary containment	Acetone, benzene, ethanol	Oxidizers
Oxidizers	Store in secondary containment, separate from flammable and combustible materials	Sodium hypochlorite, potassium chlorate, peroxides, nitrates	Separate from reducing agents, flammables, and combustibles
Water-Reactive	Store in dry, cool location, protect from water fire sprinkler	Sodium metal, potassium metal, lithium metal	Separate from all aqueous solution, and oxidizers
Compressed Gas - Flammable	Store in cool, dry area, away from oxidizing gases. Securely strap or chain cylinders to a wall or bench top	Methane, acetylene, propane	Oxidizing and toxic compressed gases, oxidizing solids
Compressed Gas - Oxidizing	Store in cool, dry area, away from flammable gases and liquids. Securely strap or chain cylinders to a wall or bench top	Oxygen, chlorine, bromine	Flammable gases

***Note*: Certain chemicals require special segregation precautions to be taken. Concentrated nitric and perchloric acids should be stored in their own secondary containment within a corrosive storage cabinet due to oxidizing characteristics. Amines are often flammable in addition to being corrosive and should be stored in their own secondary containment within a chemical storage cabinet.**