

Chemical Storage and Management

Description

The following is a general guideline on how chemicals should be stored in a laboratory setting. Always consult the Safety Data Sheet to identify incompatible materials and determine proper storage requirements.

General Rules for Chemical Storage

Chemical Storage Guidelines

1. Do not store liquid chemicals above shoulder height.
2. Flammable chemicals in amounts exceeding 10 gallons must be stored in flammable storage cabinets or safety containers.
3. Only two 1 lb propane cylinders can be stored in the lab, with an additional two in a flammable storage cabinet.
4. Bottles may not be stored on the floor unless they are contained in tubs or other secondary containment.
5. Excessive chemical storage in hoods is not acceptable; this practice interferes with the airflow in the hood and reduces the available workspace.
6. Chemical waste shall be placed at the designated accumulation area, in appropriate receptacles, properly labeled and segregated by hazard class.

Solid or Powdered Chemicals

Most solid chemicals may be shelved alphabetically with the following exceptions:

1. Phenol crystals must be separated from oxidizers.
2. Cyanide compounds must not be stored near acids.
3. Flammable solids should be stored segregated from other solids or in Flammable Storage Cabinets.
4. Powdered metals should be stored as directed on the bottle label or SDS.
5. Storage of some metals may depend on the conditions in which they are packed (e.g., in a flammable solvent), which may require storage in flammable storage cabinets.

Liquid Chemicals

All liquid chemicals must be segregated by hazard classification and stored only with compatible substances. The following categories of liquid chemicals should be segregated from other categories.

1. Acids: Organic acids should be kept separate from inorganic (mineral) acids. For example, store acetic and formic acids separate from hydrochloric and sulfuric acids. Not all inorganic acids are

compatible, please refer to the acid compatibility guide.

2. Bases: May react violently with acids, oxidizers or flammables.
3. Oxidizers: Keep away from acids, bases, organics and metals; keep cool. Examples of strong oxidizers: Perchloric acid, nitric acid, concentrated hydrogen peroxide.
4. Flammable liquids: Minimize the amount of solvents on the benchtop or open shelving. A maximum of 10 gallons may be left out in the lab.
5. Flammables, acids, bases, and oxidizers must all be kept separated from each other due to their incompatibility towards each other.
6. Toxic or poisonous liquids: Must be segregated and stored separately, as they could be released and/or intensified when reacting with the other chemicals. Examples of this may be cyanide solutions. Other chemicals, such as formaldehyde should be stored in plastic bottles at the lowest shelf or storage space.

Corrosive Chemicals

Corrosives consist of four major classes: acids, bases, dehydrating agents and oxidizing agents. Inhalation of the vapors of these substances can cause severe respiratory tract irritation. Contact with these chemicals may cause burns to the skin, respiratory tract and eyes.

Chemical Storage Guidelines

Acids and bases Image not found or type unknown

1. Store separately in a cool ventilated area, away from metals, flammables and oxidizing material.
2. Secondary containment, such as chemical resistant tubs or bottle carriers, should be used to isolate and protect bottles, especially when being transported.
3. The storage area should be checked regularly for spills and leaks.
4. Suitable spill clean-up materials must be available.
5. Always pour acids into water, never the reverse. **Remember: “AAA – Always Add Acids”**
6. Cap bottles securely. The only exception to this will be the loose capping of mixtures if they generate gases during storage. Examples would be Aqua Regia, piranha solutions and similar highly corrosive mixtures. These should be stored in fume hoods or vented cabinets.

Flammable/Combustible Liquids

1. Storage of flammable materials should comply with those requirements specified in the NFPA 45 and EH&S regulations and guidelines.
2. Keep only small quantities (500 ml or less) of flammable materials available for immediate use.
3. Quantities greater than ten (10) gallons stored cumulatively throughout a laboratory will require the use of safety cans or a flammable storage cabinet.
4. An approved safety can with a self-closing cover, vent, and flame arrestor is the best container for storing flammable liquids or waste solvents in small quantities. An ordinary five-gallon container does not provide adequate protection in case of fire.
5. Fifty-five (55) gallon drums are not allowed in labs unless they are stored in flammable storage cabinets with appropriate spill control and grounding. This must be approved in advance by EH&S.

Flammable-Storage-Rated-Refrigerators

Household refrigerators and freezers are not equipped with electrical-safe controls and shall not be used to store flammable liquids. The flammable storage refrigerator/freezer is constructed with its controls mounted outside the storage compartment. This type of refrigerator is suitable for storing flammable liquids and is labeled by the manufacturer as such.

Oxidizers

Included in this class of chemicals are nitrates, permanganates and oxides. These compounds present fire and explosion hazards that can occur in contact with organic compounds and other oxidizing substances. Suggestions for safe use and storage:

1. Oxidizing agents should be stored separately from flammable liquids, corrosives, organics, dehydrating agents and reducing agents.
2. Strong oxidizing agents should be stored and used in glass or other inert containers. Corks and rubber stoppers should not be used.
3. Oxidizing agents should be used with caution in the vicinity of flammable materials.