SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
Deemed to be University u/s 3 of UGC Act, 1956

1. Title	Standard operating procedure for "chemical storage"

2. Purpose	To provide information on the safe storage of chemicals and afford employee protection from potential health and physical hazards associated with accidentally mixing incompatible chemicals.

3. Scope	This procedure provides general safety procedures for chemical storage. Specific instructions on chemical storage may be obtained from the MSDS, container label, or by contacting OES.

4. Responsibility	Respective Store manager and Personnel utilizing chemicals

6. Definitions

4.1 Pyrophoric Substance - Materials which will react with the air to ignite when exposed, e.g., white phosphorus.

4.2 Oxidizing Agent – Reactive material that oxidizes another substance and is reduced.

4.3 Acid – Corrosive material that that produces H+ (aq) ions in aqueous solution. Strong acids ionize completely or almost completely in dilute aqueous solution. Weak acids ionize only slightly.

4.4 Base – Corrosive material that produces OH (aq) ions in aqueous solution. Strong bases are soluble in water and are completely dissociated. Weak bases ionize only slightly.

4.5 Flammable - A liquid as defined by NFPD and DOT as having a flash point below 37.8°C (100°F).

5. Procedure

5.1 Know the properties of the chemicals used.

5.2 In general, chemicals should be separated according to the following categories:

5.2.1 Solvents, which include flammable/combustible liquids and halogenated hydrocarbons (e.g., acetone, benzene, ethers, alcohols) Note: Store glacial acetic acid as a flammable liquid

5.2.2 Inorganic mineral acids (e.g., nitric, sulfuric, hydrochloric, and perchloric acids).

5.2.3 Bases (e.g., sodium hydroxide, ammonium hydroxide)

5.2.4 Oxidizers

5.2.5 Poisons

5.2.6 Explosives or unstable reactives, such as picric acid. Store separately outdoors in flammable storage cabinets. An inventory of all chemicals must be maintained. Inventories must include the full chemical name, location of storage, and associated hazard (e.g. corrosive or flammable

5.3 Inventories must be updated annually and signed by the person performing the update. Chemicals purchased throughout the year must be added to the inventory as soon as they are brought into the work area. Post chemical inventories inside the room with a hazard summary posting on the door for emergency response purposes.

5.4 Ensure that all containers are in good condition, properly capped, and labeled. If you are using short hand names or acronyms on any solutions, reagents, or aliquots of chemicals, you must maintain a cross-reference sheet that defines the short hand name or acronym in use such as EtOH = ethanol or PBS=phosphate buffered saline. Review this list annually to ensure that all short hand names or acronyms in use are recorded.

5.5 Store all hazardous liquid chemicals in drip trays that are chemically resistant. Photo trays provide good containment and are widely used at the Lab. Install Plexiglas lips or use equivalent means to prevent materials from falling off storage shelves.

5.6 Avoid storing chemicals on countertops or in fume hoods except for those being currently used.

5.7 Avoid storing chemicals above eye level. Select low shelves or cabinets for heavy containers. Never store chemicals or any other item closer than 18" to the ceiling. Storing an item close to the ceiling will impede the effectiveness of automatic fire suppression systems.

5.8 Do not store chemicals on the floor. Chemical containers could present a tripping hazard or could be knocked over causing a spill.

5.9 Label all containers (squeeze bottles and Nalgene bottles) to which hazardous materials are transferred with the identity of the substance and its hazards. Be aware that squeeze bottles and Nalgene bottles have varying resistances to different chemicals.

5.10 Limit the amount of chemicals stored to the minimum required.

5.11 Avoid exposure of chemicals to heat or direct sunlight. This may lead to the deterioration of storage containers as well as the degradation of the chemicals.

5.12 Use approved corrosive storage cabinets (constructed of chemically resistant components) for storing acids and bases.

5.13 Use flammable storage cabinets to store flammable liquids.

5.14 Refrigerators used for storing chemicals, samples or media must be labeled with words to the effect as follows: "Caution – Do Not Store Food or Beverages In This Refrigerator". Refrigerators used for food storage in or near work areas (shops and labs) must be labeled with words to the effect as: "Notice – Food May Be Stored In this Refrigerator". Labels may be fabricated by users provided they are legible and securely affixed to the refrigerator. Refrigerators used for food and beverage which are located in lunch rooms and office buildings, where there is no shop or lab type chemical usage do not require any posting.

5.15 Refrigerators and freezers for storing flammable liquids (including ethanol) must be designed, constructed and approved for that purpose. Domestic refrigerator/freezers as well as units that have been modified to remove spark sources are not acceptable alternatives.

5.16 Avoid mixing incompatible waste materials. A number of serious laboratory accidents have occurred when people have poured incompatible waste materials into hazardous waste containers. Use separate waste containers for each type of waste.

6.0 STORAGE ACCORDING TO HAZARD CLASSES

The following guidelines are provided for the safe storage of hazardous materials in accordance with their hazard classes:

6.1 Acids

6.1.1 Segregate acids from reactive metals such as sodium, potassium, magnesium.

6.1.2 Segregate oxidizing acids from organic acids, flammable and combustible materials.

6.1.3 Segregate acids from chemicals which could generate toxic or flammable gases upon contact, such as sodium cyanide, iron sulfide, calcium carbide

6.1.4 Segregate acids from bases.

6.2 Bases

6.2.1 Segregate bases from acids, metals, explosives, organic peroxides and easily ignitable materials.

6.3 Solvents (Flammable and Halogenated Solvents)

6.3.1 Store in approved safety cans or cabinets.

6.3.2 Segregate from oxidizing acids and oxidizers.

6.3.3 Keep away from any source of ignition: heat, sparks, or open flames.

6.4 Oxidizers

6.4.1 Store in a cool, dry place.

6.4.2 Keep away from combustible and flammable materials.

6.4.3 Keep away from reducing agents such as zinc, alkali metals, and formic acid.

6.5 Cyanides

6.5.1 Segregate from acids and oxidizers.

6.6 Water Reactive Chemicals

6.6.1 Store in a cool, dry place away from any water source.

6.6.2 Make certain that a Class D fire extinguisher is available in case of fire.

6.7 Pyrophoric

6.7.1 Store in a cool, dry place making provisions for an airtight seal.

6.8 Light Sensitive Chemicals

6.8.1 Store in amber bottles in a cool, dry, dark place.

6.9 Peroxide Forming Chemicals

6.9.1 Store in airtight containers in a dark, cool, and dry place.

6.9.2 Label containers with receiving, opening, and disposal dates.

6.9.3 Periodically test for the presence of peroxides.

6.10 Toxic Chemicals

6.10.1 Store according to the nature of the chemical, using appropriate security where necessary.

7.0 CONTINGENCIES:

7.1 In case of a fire, explosion, or gas leak evacuate individuals from the area and call the Campus Administration (7420) Notify supervision and adjacent personnel as quickly as possible. Observe appropriate procedures for personal injury or fire as provided in EHS Web site.

7.2 In case of a chemical spill, alert others in the immediate vicinity and notify your supervisor. Determine the severity of the spill and proceed as appreciate. Small spills may be cleaned up by laboratory personnel. For large spills, notify EMS Coordinator If possible to do so safely (without risk of over-exposure), take action to stop the release. Ensure that extraneous personnel remain at a safe distance until the spill is completely cleaned-up

6. References	1. Manufacture, Storage and Import of Hazardous Chemical Rules, 1989

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