

**VIRGINIA COMMONWEALTH UNIVERSITY &
MEDICAL COLLEGE OF VIRGINIA HOSPITALS**

SAFE STORAGE OF LABORATORY CHEMICALS

**OFFICE OF ENVIRONMENTAL HEALTH & SAFETY
CHEMICAL & BIOLOGICAL SAFETY SECTION
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revised September 24, 2007**

I. Guidelines For Safe Chemical Storage.

- A. Read chemical labels and MSDS for specific storage instructions.
- B. Store chemicals in a well-ventilated area; however, limit chemical storage in fume hoods.
- C. Maintain an inventory of all chemicals in storage.
- D. Return chemical containers to their proper storage location after use.
- E. Store glass chemical containers so that they are unlikely to be broken.
- F. Store all hazardous chemicals below eye level.
- G. Never store hazardous chemicals in a public area or corridor.

II. Separating Hazardous Chemicals. In addition to the guidelines above, there are storage requirements for separating hazardous chemicals. Alphabetical storage systems may place incompatible chemicals next to each other; therefore, OEHS recommends that chemicals be stored according to their hazard class. The proper hazard classes are: flammables, corrosives (acids and bases should be separated), oxidizers, carcinogens/toxins, water reactive chemicals, and pyrophoric chemicals. Once chemicals are separated into their proper hazard class, they may be alphabetized within the class.

III. Guidelines To Ensure That Hazardous Chemicals Are Stored Safely.

- A. Separate acids from bases. Store these chemicals at or near floor level but in any case, below eye level.
- B. Isolate perchloric acid from organic materials. Do not store perchloric acid on a wooden shelf or otherwise allow this acid to come into contact organic materials.
- C. Separate highly toxic chemicals and carcinogens from all other chemicals. This storage location should have an appropriate warning label and should be locked.
- D. Separate acids from flammables.
- E. Do not keep peroxide-forming chemicals longer than twelve months.
- F. Do not allow picric acid to dry out.
- G. If flammables need to be chilled, store them in a laboratory-safe refrigerator, not in a standard refrigerator.
- H. Flammables should be stored in a flammable storage cabinet.

Incompatible Chemicals

Chemical	Incompatibilities
Acetic acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene glycol, perchloric acid, peroxides, permanganates
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Acetone	Concentrated nitric and sulfuric acid mixtures
Alkali and alkaline metals (such as powdered aluminum or magnesium, calcium, lithium, sodium, potassium)	Water, carbon tetrachloride or other chlorinated hydrocarbons, carbon dioxide, halogens
Ammonia	Elemental mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid (anhydrous)
Ammonium nitrate	Acids, powdered metals, flammable liquids, chlorates, nitrites, sulfur, fine organic combustible materials
Aniline	Nitric acid, hydrogen peroxide
Arsenical materials	Any reducing agent
Azides	Acids
Bromine	Ammonia, acetylene, butadiene, butane, methane, propane, petroleum gases, hydrogen, sodium carbide, benzene, finely divided metals, turpentine
Calcium oxide	Water
Carbon (activated)	Calcium hypochlorite, all oxidizing agents
Carbon tetrachloride	Sodium
Chlorates	Ammonium salts, acids, powdered metals, sulfur, fine organic or combustible materials
Chromic acid and chromium (Chromerge)	Acetic acid, naphthalene, camphor, glycerol, alcohol, flammable liquids in general
Chlorine	Ammonia, acetylene, butadiene, butane, methane, propane, petroleum gases, hydrogen, sodium carbide, benzene, finely divided metals, turpentine
Chlorine dioxide	Ammonia, methane, phosphine, hydrogen sulfide
Copper	Acetylene, hydrogen peroxide
Cumene hydroperoxide	Acids (organic or inorganic)
Cyanides	Acids

Chemical	Incompatibilities
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Fluorine	All other chemicals
Hydrocarbons (such as butane, propane, benzene)	Fluorine, chlorine, bromine, chromic acid, sodium peroxide
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid (anhydrous)	Ammonia (aqueous or anhydrous)
Hydrogen peroxide	Copper chromium, iron, most metals and their salts, alcohols, acetone, organic materials, aniline, nitromethane, combustible material
Hydrogen sulfide	Fuming nitric acid, oxidizing gases
Hypochlorites	Acids, activated carbon
Iodine	Acetylene, ammonia (aqueous or anhydrous), hydrogen
Mercury	Acetylene, fulminic acid, ammonia
Nitrates	Sulfuric acid
Nitric acid (concentrated)	Acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide, flammable liquids, flammable gases, copper, brass, heavy metals
Nitrites	Acids
Nitroparaffins	inorganic bases, amines
Oxalic acid	Silver, mercury
Oxygen	Oils, grease, hydrogen, Flammable liquids, flammable solids, flammable gases
Perchloric acid	Acetic anhydride, bismuth and its alloys, alcohol, paper, wood, grease, oils
Peroxides (organic)	Acids (organic or mineral), friction, heat
Phosphorus (white)	Air, oxygen, alkalies, reducing agents
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chlorate	acids
Potassium permanganate	Glycerol, ethylene glycol, benzaldehyde, sulfuric acid
Selenides	Reducing agents

Chemical	Incompatibilities
Silver	Acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
Sodium	Carbon tetrachloride, carbon dioxide, water
Sodium nitrate	Ammonium nitrate and other ammonium salts
Sodium peroxide	Ethyl or methyl alcohol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulfide, glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
Sulfides	Acids
Sulfuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate, light metal compounds (sodium, lithium)
Tellurides	Reducing agents