

## INCOMPATIBILITY OF COMMON LABORATORY CHEMICALS

When certain hazardous chemicals are stored or mixed together, violent reactions may occur because the chemicals are unsuitable for mixing, or are incompatible. Classes of incompatible chemicals should be segregated from each other during storage, according to hazard class. Use the following general guidelines for hazard class storage:

- Flammable/Combustible Liquids and Organic Acids
- Flammable Solids
- Mineral Acids
- Caustics
- Oxidizers
- Perchloric Acid
- Compressed Gases

Before mixing any chemicals, refer to this partial list, the chemicals' MSDS's or call OLSC at 4-3282 to verify compatibility:

<b>CHEMICAL</b>	<b>INCOMPATIBLE CHEMICAL(S)</b>
<b>Acetic acid</b>	aldehyde, bases, carbonates, hydroxides, metals, oxidizers, peroxides, phosphates, xylene
<b>Acetylene</b>	halogens (chlorine, fluorine, etc.), mercury, potassium, oxidizers, silver
<b>Acetone</b>	acids, amines, oxidizers, plastics
<b>Alkali and alkaline metals</b>	acids, chromium, ethylene, halogens, hydrogen, mercury, <b>earth</b> nitrogen, oxidizers, plastics, sodium chloride, sulfur
<b>Ammonia</b>	acids, aldehydes, amides, halogens, heavy metals, oxidizers, plastics, sulfur
<b>Ammonium nitrate</b>	acids, alkalis, chloride salts, combustible materials, metals, organic materials, phosphorous, reducing agents, urea
<b>Aniline</b>	acids, aluminum, dibenzoyl peroxide, oxidizers, plastics
<b>Azides</b>	acids, heavy metals, oxidizers
<b>Bromine</b>	acetaldehyde, alcohols, alkalis, amines, combustible materials, ethylene, fluorine, hydrogen, ketones (acetone, carbonyls, etc.), metals, sulfur

<b>Calcium oxide</b>	acids, ethanol, fluorine, organic materials
<b>Carbon (activated)</b>	alkali metals, calcium hypochlorite, halogens, oxidizers
<b>Carbon tetrachloride</b>	benzoyl peroxide, ethylene, fluorine, metals, oxygen, plastics, silanes
<b>Chlorates</b>	powdered metals, sulfur, finely divided organic or combustible materials
<b>Chromic acid</b>	acetone, alcohols, alkalis, ammonia, bases
<b>Chromium trioxide</b>	benzene, combustible materials, hydrocarbons, metals, organic materials, phosphorous, plastics
<b>Chlorine</b>	alcohol's, ammonia, benzene, combustible materials, flammable compounds (hydrazine), hydrocarbons (acetylene, ethylene, etc.), hydrogen peroxide, iodine, metals, nitrogen, oxygen, sodium hydroxide
<b>Chlorine dioxide</b>	hydrogen, mercury, organic materials, phosphorous, potassium hydroxide, sulfur
<b>Copper</b>	calcium, hydrocarbons, oxidizers
<b>Hydroperoxide</b>	reducing agents
<b>Cyanides</b>	acids, alkaloids, aluminum, iodine, oxidizers, strong bases
<b>Flammable liquids</b>	ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
<b>Fluorine</b>	alcohol's, aldehydes, ammonia, combustible materials, halocarbons, halogens, hydrocarbons, ketones, metals, organic acids
<b>Hydrocarbons (Such as butane, propane benzene, turpentine,</b>	acids, bases, oxidizers, plastics

etc.)	
<b>Hydrofluoric acid</b>	metals, organic materials, plastics, silica (glass), (anhydrous) sodium
<b>Hydrogen peroxide</b>	acetaldehyde, acetic acid, acetone, alcohol's carboxylic acid, combustible materials, metals, nitric acid, organic compounds, phosphorous, sulfuric acid, sodium, aniline
<b>Hydrogen sulfide</b>	acetaldehyde, metals, oxidizers, sodium
<b>Hypochlorites</b>	acids, activated carbon
<b>Iodine</b>	acetaldehyde, acetylene, ammonia, metals, sodium
<b>Mercury</b>	acetylene, aluminum, amines, ammonia, calcium, fulminic acid, lithium, oxidizers, sodium
<b>Nitrates</b>	acids, nitrites, metals, sulfur, sulfuric acid
<b>Nitric acid</b>	acetic acid, acetonitrile, alcohol's, amines, (concentrated) ammonia, aniline, bases, benzene, cumene, formic acid, ketones, metals, organic materials, plastics, sodium, toluene
<b>Oxalic acid</b>	oxidizers, silver, sodium chlorite
<b>Oxygen</b>	acetaldehyde, secondary alcohol's, alkalis and alkalines, ammonia, carbon monoxide, combustible materials, ethers, flammable materials, hydrocarbons, metals, phosphorous, polymers
<b>Perchloric acid</b>	acetic acid, alcohols, aniline, combustible materials, dehydrating agents, ethyl benzene, hydriotic acid, hydrochloric acid, iodides, ketones, organic material, oxidizers, pyridine
<b>Peroxides, organic</b>	acids (organic or mineral)
<b>Phosphorus (white)</b>	oxygen (pure and in air), alkalis

<b>Potassium</b>	acetylene, acids, alcohols, halogens, hydrazine, mercury, oxidizers, selenium, sulfur
<b>Potassium chlorate</b>	acids, ammonia, combustible materials, fluorine, hydrocarbons, metals, organic materials, sugars
<b>Potassium perchlorate (also see chlorates)</b>	alcohols, combustible materials, fluorine, hydrazine, metals, organic matter, reducing agents, sulfuric acid
<b>Potassium permanganate</b>	benzaldehyde, ethylene glycol, glycerol, sulfuric acid
<b>Silver</b>	acetylene, ammonia, oxidizers, ozonides, peroxyformic acid
<b>Sodium</b>	acids, hydrazine, metals, oxidizers, water
<b>Sodium nitrate</b>	acetic anhydride, acids, metals, organic matter, peroxyformic acid, reducing agents
<b>Sodium peroxide</b>	acetic acid, benzene, hydrogen sulfide metals, oxidizers, peroxyformic acid, phosphorous, reducers, sugars, water
<b>Sulfides</b>	acids
<b>Sulfuric acid</b>	potassium chlorates, potassium perchlorate, potassium permanganate

## Basic Chemical Segregation

CLASS OF CHEMICALS	RECOMMENDED STORAGE METHOD	EXAMPLES	INCOMPATIBILITIES SEE MSDS IN ALL CASES
Compressed Gases- Flammable	Store in a 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 Gases- Oxidizing	Store in a cool, dry area, away from flammable gases and liquids. Securely strap or chain cylinders to a wall or bench.	Oxygen, chlorine, bromine	Flammable gases.
Compressed Gases- Poisonous	Store in a cool, dry area, away from flammable gases and liquids. Securely strap or chain cylinders to a wall or bench.	Carbon monoxide, hydrogen sulphide (H <sub>2</sub> S)	Flammable and/or oxidizing gases.
Corrosives - Acids	Store in separate acid storage cabinet.	Mineral acids - Hydrochloric acid, sulfuric acid, nitric acid, perchloric acid, chromic acid, chromerge	Flammable liquids, flammable solids, bases, oxidizers.
Corrosives - Bases	Store in separate storage cabinet.	Ammonium hydroxide, sodium hydroxide	Flammable liquids, oxidizers, poisons, and acids.
Shock Sensitive Materials	Store in secure location away from all other chemicals.	Ammonium nitrate, Nitro Urea, Picric Acid (in dry state), Trinitroaniline, Trinitroanisole, Trinitrobenzene, Trinitrobenzenesulfonic acid, Trinitrobenzoic acid, Trinitrochlorobenzene, Trinitrophenol/Picric acid, trinitrotoluene, Urea Nitrate, Zirconium picramate	Flammable liquids, oxidizers, poisons, acids, and bases.
Flammable Liquids	In grounded flammable storage cabinet.	Acetone, benzene, diethyl ether, methanol, ethanol, toluene, glacial acetic acid	Acids, bases, oxidizers, and poisons.
Flammable Solids	Store in a separate dry, cool area away from oxidizers, corrosives, flammable liquids.	Phosphorus	Acids, bases, oxidizers, and poisons.
General Chemicals Non-reactive	Store on general laboratory benches or shelving preferably behind glass doors, or	Agar, sodium chloride, sodium bicarbonate, and most non-reactive salts	See MSDS

	below eye level.		
Oxidizers	Store in a spill tray inside a noncombustible cabinet, separate from flammable and combustible materials.	Sodium hypochlorite, benzoyl peroxide, potassium permanganate, potassium chlorate, potassium dichromate. The following are generally considered oxidizing substances: peroxides, perchlorates, chlorates, nitrates, bromates, superoxides	Separate from reducing agents, flammables and combustibles.
Poisons	Store separately in vented, cool, dry, area, in unbreakable chemically resistant secondary containers.	Cyanides, heavy metals compounds, i.e. cadmium, mercury, osmium	Flammable liquids, acids, bases, and oxidizers.
Water Reactive Chemicals	Store in dry, cool, location, protect from water fire sprinkler.	Sodium metal, potassium metal, lithium metal, lithium aluminum hydride	Separate from all aqueous solutions, and oxidizers.