



## Brandeis Safety Operating Guidelines

Title: **Chemical Storage Compatibility**

Revision 00

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### WHAT IS THE SCOPE OF THIS GUIDELINE?

This Guideline applies to all lab personnel working with hazardous materials in a lab.

The storage of chemicals properly is critical in reducing potential interactions that could cause fire, explosion, evolution of toxic fumes or gases and other potentially hazardous conditions.

### HOW DO I PROTECT MYSELF?

Review the material safety data sheet (MSDS) prior to using these materials.

Store hazardous materials in accordance with manufacturer's recommendations, material safety data sheet information and this guidance.

### COMPATABILITY INFORMATION

#### ***Segregation and Storage With Respect To Hazard Class***

##### **Acids**

- Segregate acids from reactive metals such as sodium, potassium, and magnesium.
- Segregate oxidizing acids from organic acid and flammable and combustible materials.
- Store acetic acid as a flammable liquid. This is an organic (carboxylic) acid that will react if it comes in contact with an oxidizing acid.
- Nitric acid and hydrochloric acid may be stored in the same corrosive storage cabinet, but they must be kept in separate drip trays. These can combine to form chlorine and nitrosyl chloride gases—both are toxic.

- Segregate acids from chemicals that could generate toxic or flammable gases upon contact, such as sodium cyanide, iron sulfide and calcium carbide.
- Segregate acids from bases.

### **Bases**

- Segregate bases from acids, metals, explosives, organic peroxides and easily ignitable materials.
- Do not store aqueous sodium and potassium hydroxide solutions in aluminum drip trays. These will corrode aluminum.

### **Solvents (Flammable and combustible liquids)**

- Store in approved safety cans or cabinets.
- Segregate from oxidizing acids and oxidizers.
- Keep away from any source of ignition: heat, sparks, or open flames.

### **Oxidizers**

- Keep away from combustible and flammable materials.
- Keep away from reducing agents such as zinc, alkali metals, and formic acid.

### **Cyanides**

- Segregate from aqueous solutions, acids and oxidizers.

### **Water-Reactive Chemicals**

- Store in a cool, dry place, away from any water source.
- Make certain that a Class D fire extinguisher is available in case of fire.

### **Pyrophoric Substances**

- If in original container store in a cool, dry place, making provisions for an airtight seal.
- Store in a glove box after the material has been opened.

### **Light-Sensitive Chemicals**

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

## Peroxide-Forming Chemicals

- Most peroxide forming chemicals are also flammable liquids. Therefore, store in airtight containers in a flammable storage locker.
- Segregate from oxidizers and acids.

## Toxic Chemicals

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

## SEGREGATION TABLE

CHEMICAL	KEEP OUT OF CONTACT WITH
Acetic acid	Chromic acid, nitric acid, hydroxyl compounds, ethylene glycol, perchloric acid, peroxides, permanganates and other oxidizers
Acetone	Concentrated nitric and sulfuric acid mixtures, and strong bases
Acetylene	Chlorine, bromine, copper, fluorine, silver, mercury
Alkali metals	Water, carbon tetrachloride or other chlorinated hydrocarbons, carbon dioxide, the halogens
Ammonia, anhydrous	Mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid
Ammonium nitrate	Acids, metal powders, flammable liquids, chlorates, nitrites, sulfur, finely divided organic or combustible materials
Aniline	Nitric acid, hydrogen peroxide
Arsenic materials	Any reducing agent
Azides	Acids
Bromine	Same as chlorine
Calcium oxide	Water
Carbon (activated)	Calcium hypochlorite, all oxidizing agents
Carbon tetrachloride	Sodium
Chlorates	Ammonium salts, acids, metal powders, sulfur, finely divided organic or combustible materials

Chromic acid and chromium trioxide	Acetic acid, naphthalene, camphor, glycerol, glycerin, turpentine, alcohol, flammable liquids in general
Chlorine	Ammonia, acetylene, butadiene, butane, methane, propane (or other petroleum gases), hydrogen, sodium carbide, turpentine, benzene, finely divided metals
Chlorine dioxide	Ammonia, methane, phosphine, hydrogen sulfide
Copper	Acetylene, hydrogen peroxide
Cumene hydroperoxide	Acids, organic or inorganic
Cyanides	Acids
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Hydrocarbons	Fluorine, chlorine, bromine, chromic acid, sodium peroxide
Hydrocyanic acid	Nitric acid, alkali
Hydrofluoric acid	Ammonia, aqueous or anhydrous, bases and silica
Hydrogen peroxide	Copper, chromium, iron, most metals or their salts, alcohols, acetone, organic materials, aniline, nitromethane, flammable liquids
Hydrogen sulfide	Fuming nitric acid, other acids, oxidizing gases, acetylene, ammonia (aqueous or anhydrous), hydrogen
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, any heavy metals
Nitrites	Acids
Nitroparaffins	Inorganic bases, amines
Oxalic acid	Silver, mercury
Oxygen	Oils, grease, hydrogen; flammable liquids, solids, or gases

Perchloric acid	Acetic anhydride, bismuth and its alloys, alcohol, paper, wood, grease, and oils
Peroxides, organic	Acids (organic or mineral), avoid friction, store cold
Phosphorus (white)	Air, oxygen, alkalis, reducing agents
Potassium	Carbon tetrachloride, carbon dioxide, water
Potassium chlorate and perchlorate	Sulfuric and other acids
Potassium permanganate	Glycerin, ethylene glycol, benzaldehyde, sulfuric acid
Selenides	Reducing agents
Silver	Acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
Sodium	Carbon tetrachloride, carbon dioxide, water
Sodium nitrite	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 (or compounds with similar light metals, such as sodium, lithium, etc.)
Tellurides	Reducing agents

(Berkeley National Labs)

## HANDLING EMERGENCIES

Anticipate emergency situations, have proper handling equipment in the lab and readily available for spills. Check the MSDS to determine what is appropriate.

In the event of a spill or adverse reaction notify lab personnel immediately that an incident has occurred. Do not attempt to handle a large spill/reaction/fire, or one in which you are not trained or equipped for. Turn off all ignition sources if this can be done safely, vacate the area and call for assistance.

Laboratory emergencies should be reported to the Public Safety Office at **63333**. Public Safety will also contact the EH&S Office at **64262**. Communicate the following:

- Location of spill/incident
- Type of material involved and quantity
- Injuries involved
- Fire/explosion
- Your location/contact information (or who to contact for further information)

Notify the PI or designated Safety Officer as soon as possible also.

### [WASTE DISPOSAL REQUIREMENTS](#)

Disposal requests should be called into the Waste Hotline at **62561**.