

**CHEMICAL STORAGE SEGREGATION GUIDELINES**  
**UNIVERSITY OF NORTH DAKOTA**  
**OFFICE OF SAFETY**

In order to store chemicals properly, they must be segregated based on the associated hazard. Never store chemicals alphabetically until they have been segregated by hazard class. The following broad hazard classes can serve as a guide for segregating your hazardous materials. It is a good practice to store solids above and liquids below.

CLASS OF CHEMICALS	RECOMMENDED STORAGE METHOD	CHEMICAL EXAMPLES	INCOMPATIBLES SEE SAFETY DATA SHEETS IN ALL CASES
Compressed Gases-Flammable (Includes Combustible)	Store in a cool, dry area, at least <b>20 feet</b> away from oxidizing gases. Securely strap or chain cylinders to a wall or bench top. North Dakota Fire Code may require a flammable gas cabinet for storage.	Methane, Acetylene, Hydrogen	Oxidizing and toxic compressed gases, oxidizing solids.
Compressed Gases-Liquefied Flammable	Store in a cool, dry area at least <b>20 feet</b> away from oxidizing gases. Securely strap or chain cylinders to a wall or bench top. North Dakota Fire Code may require a flammable gas cabinet for storage. Limit storage inside buildings to 16 oz. containers or less. Larger cylinders are for day use only inside buildings. Permanent storage should be located outside of the building.	Propane, Butane	Oxidizing and toxic compressed gases, oxidizing solids.
Compressed Gases – Reactive (Includes Oxidizing)	Store in a cool, dry area at least <b>20 feet</b> away from flammable gases and liquids. Securely strap or chain cylinders to a wall or bench top. Some gases may require a ventilated gas storage cabinet.	Oxygen, Chlorine, Bromine	Flammable gases

CLASS OF CHEMICALS	RECOMMENDED STORAGE METHOD	CHEMICAL EXAMPLES	INCOMPATIBLES SEE SAFETY DATA SHEETS IN ALL CASES
Compressed Gases – Threat to Human Health (includes Toxic and Corrosive)	Store in a cool, dry area away from flammable gases and liquids. Securely strap or chain cylinders to a wall or bench top. Some gases may require a ventilated gas storage cabinet.	Carbon monoxide, Hydrogen sulfide	Flammable and/or oxidizing gases
Corrosives- Acids INORGANIC	Store in a separate, lined/protected acid storage cabinet or plastic secondary container	<b>Inorganic (mineral) acids</b> - Hydrochloric acid, Sulfuric acid, Chromic acid, Nitric acid. <i>Note: Nitric acid is a strong oxidizer and should be stored by itself. Separate nitric acid from other acids by storing in a secondary container or separate acid cabinet.</i>	Flammable liquids, flammable solids, bases and oxidizers. <b>Organic acids.</b>
Corrosive – Acids ORGANIC	Store in a separate lined/protected acid storage cabinet or plastic secondary container.	<b>Organic acids</b> – Acetic acid, trichloroacetic acid, lactic acid	Flammable liquids, flammable solids, bases and oxidizers. <b>Inorganic acids.</b>
Corrosives – Bases	Store in a separate storage cabinet.	Ammonium hydroxide, potassium hydroxide, sodium	Oxidizers and Acids
Explosives	Store in a secure location away from all other chemicals. Do not store in an area where they can fall.	Ammonium nitrate, nitro urea, sodium azide, trinitroaniline, trinitroanisole, trinitrobenzene, trinitrophenol/picric acid, trinitrotoluene (TNT)	All other chemicals

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Flammable Liquids	Store in a flammable storage cabinet. <i>Note: Peroxide forming chemicals must be dated upon receiving and opening and disposed within 6 months. e.g., ether, tetrahydrofuran, dioxane</i>	Acetone, Benzene, Diethyl ether, Methanol, Ethanol, Hexanes, Toluene	Oxidizers and Acids
Flammable Solids	Store in a separate dry cool area away from oxidizers, corrosives	Phosphorus, carbon, charcoal	Oxidizers and Acids
Water Reactive Chemicals	Store in a cool dry location. Protect from water and the fire sprinkler system. If applicable. Label location – WATER REACTIVE CHEMICAL -	Sodium metal, potassium metal, lithium metal, lithium aluminum hydride	Separate from all aqueous solutions, and oxidizers
Oxidizers	Store in a spill tray inside a non-combustible cabinet, separate from flammable and combustible materials.	Sodium hypochlorite, benzoyl peroxide, potassium permanganate, potassium chlorate, potassium dichromate. <i>Note: The following chemical groups are considered oxidizers: Nitrates, Nitrites, Chromates, Dichromates, chlorites, permanganates, persulfates, peroxides, picrates, bromates, iodates, superoxides</i>	Separate from reducing agents, flammables, combustibles and organic materials.

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Toxics (Poisons)	Store separately in a vented cool, dry area in a chemical resistant secondary container	Cyanides, heavy metals compounds i.e. cadmium, mercury, osmium	See Safety Data Sheet (SDS)
Pyrophoric Liquids	Store under an inert atmosphere. Do NOT store in a flammable liquids cabinet. Store away from sources of ignition	Grignard reagents, n-butyl lithium, t-butyl lithium	Separate from all aqueous solutions and oxidizers
General Chemicals Non-Reactive	Store on general laboratory benches or shelving. Use upper shelving for non-hazardous chemicals only.	Agar, sodium chloride, sodium bicarbonate and most non-reactive salts.	See Safety Data Sheet (SDS)

The following gases will require ventilated storage: Ammonia, Arsenic pentafluoride, Arsine, Boron trifluoride, 1, 3-Butadiene, Carbon monoxide, chlorine trifluoride, chloroethane, cyanogen, diborane, dichloroborane, dichlorosilane, dimethylamine, ethylamine, ethylene, ethylene oxide, fluorine, formaldehyde, germane, hydrogen chloride, hydrogen cyanide, hydrogen fluoride, hydrogen selenide, hydrogen sulfide, methylamine, methyl bromide, methyl chloride, methyl mercaptan, nitrogen oxides, phosgene, phosphine, silane, silicon tetrafluoride, stilbine, trimethylamine, vinyl chloride