3.4.1 Chemical Compatibility Guide

All facilities and departments at Stephen F. Austin State University are responsible for safely managing chemical supplies and complying with fire code allowances in areas under their purview. An important rule of chemical storage is to segregate incompatible chemicals which, if accidentally mixed, could cause fire, explosion, or the generation of toxic gases. Hazardous chemical reactions can occur from improper storage when incompatible materials mix because of:

* Accidental breakage
* Container failure
* Fires and earthquakes
* Mixing of gases or vapors from poorly closed containers
* Mistakenly storing incompatibles together because of improperly labeled containers

3.4.1.1 Partial List of Incompatible Chemicals

Below list is an example of incompatible chemicals. Substances in the left hand column should be stored and handled so that they cannot accidentally contact corresponding substances in the right hand column under uncontrolled conditions.

Chemical	Separate From
Acetic Acid	Chromic acid, nitric acid, peroxides, permanganates
Acetic anhydride	Hydroxyl-containing compounds such as ethylene glycol, Perchloric acid
Acetone	Concentrated nitric and sulfuric acid mixtures, hydrogen peroxide
Acetonitrile	Strong acids and bases
Acetylene	Chlorine, bromine, copper, silver, fluorine, mercury
Alkali and alkaline earth metals, such as sodium, potassium, lithium, magnesium, calcium, powdered aluminum	Carbon dioxide, carbon tetrachloride, other chlorinated hydrocarbons (also prohibit the use of water, foam, and dry chemical extinguishers on fires involving these metals—dry sand should be employed)
Ammonia (anhydrous)	Mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrogen fluoride
Ammonium hydroxide	Strong acids, hydrogen peroxide, acidic metals
Aniline	Nitric acid, hydrogen peroxide
Chromic acid and chromium trioxide	Acetic acid, naphthalene, camphor, lycerol, turpentine, alcohol, other flammable liquids
Chlorine	Ammonia, acetylene, butadiene, butane, other

	petroleum gases, hydrogen, sodium carbide, turpentine benzene, finely divided metals
Chloroform	Alkali metals (e.g. sodium, potassium), acetone, strong bases
Copper	Acetylene, hydrogen peroxide
Fluorine	Isolate from everything
Formaldehyde	Nitric acid, sulfuric acid, hydrochloric acid, Perchloric acid, anhydrides, inorganic acids
Hydrazine	Hydrogen peroxide, nitric acid, any other oxidant
Hydrocarbons (benzene, butane, propane, gasoline, turpentine, etc.)	Fluorine, chlorine, bromine, chromic acid, peroxides
Hydrochloric acid	Strong bases, permanganates, chlorates, chlorites
Hydrocyanic acid	Nitric acid, alkalis
Methanol	Perchloric acid, sulfuric acid, nitric acid, highly reactive metals (e.g., potassium, sodium, magnesium)
Nitric Acid	Acetic anhydride, acetone, Acetonitrile, alcohols, thiols, amines, dichloromethane, DMSO, benzene, bases
Phenol	Nitric acid, Perchloric acid, sulfuric acid
Pyridine	dinitrogen tetroxide, acid chlorides, anhydrides, Perchloric acid

A are incompatible with	B
Alkali and alkaline earth	Water
• Carbides	Acids
• Hydrides	Halogenated organic compounds
• Hydroxides	Halogenating agents
• Metals	Oxidizing agents
• Peroxides	
Azides, inorganic	Acids
	Heavy metals and their salts
	Oxidizing agents
Cyanides, inorganic	Acids
	Strong bases
Nitrates, inorganic	Acids
	Reducing agents
Organic compounds	Oxidizing agents
• Organic acyl halides	Bases
	Organic hydroxy and amino compounds
• Organic anhydrides	Bases
	Organic hydroxy and amino compounds
Organic halogen compounds	Group IA and IIA metals
	Aluminum
Organic nitro compounds	Strong bases
Oxidizing agents	Reducing agents
Chlorates	Ammonia, anhydrous and aqueous
Chromates	Carbon
Chromium trioxide	Metals
Dichromates	Metal hydrides
Halogens	Nitrites
Halogenating agents	Organic compounds
Hydrogen peroxide	Phosphorus
Nitric acid	Silicon
Nitrates	Sulfur
Reducing agents	Oxidizing agents
	Arsenates
	Arsenites
	Phosphorus
	Selenites
	Selenates
	Tellurium salts and oxides
Sulfides, inorganic	Acids