Chemical Segregation and Storage Table

Adapted from Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, National Research Council, 1995, University of Texas/Health Science at Houston and Boston University Environmental Health and Safety.

Class of Chemical	Common Chemical Examples	Additional Concerns & Recommendations	Common Incompatible Chemical Types	Possible Reaction if Mixed/Health Concerns
Corrosive Acid-Organic 	▪ Acetic Acid ▪ Butyric Acid ▪ Formic Acid ▪ Glacial Acetic Acid ▪ Picric Acid ▪ Propionic Acid ▪ Trifluoroacetic Acid	Store in ventilated corrosives cabinet on protected shelving using secondary containment, keep away from water sources. *Do not store under the sink. *Do not store acids on metal shelving.	▪ Bases ▪ Cyanides ▪ Flammable Liquids ▪ Flammable Solids ▪ Inorganic Acids ▪ Oxidizers ▪ Poisons/Toxins ▪ Sulfides	▪ Gas Generation ▪ Heat ▪ Violent Reaction *DO NOT POUR WATER INTO ACID
Corrosive Acids-Inorganic 	▪ Chromic Acid ▪ Hydrochloric Acid ▪ Hydrofluoric Acid ▪ Nitric Acid ▪ Perchloric Acid ▪ Phosphoric Acid ▪ Sulfuric Acid	Store concentrated Nitric acid (≥68%) and Sulfuric acid (≥93%) in a secondary container. Store in a corrosive cabinet labeled "Acid" or on shelving using secondary containment. *Do not store under the sink. *Do not store acids on metal shelving. *Hydrofluoric acid should be stored in an area accessible only by authorized personnel; do not store in glass; use plastic containers and secondary containment.	▪ Bases ▪ Cyanides ▪ Flammable ▪ Flammable Solids ▪ Liquids ▪ Organic Acids ▪ Oxidizers ▪ Poisons/Toxins ▪ Sulphides	▪ Gas Generation ▪ Heat ▪ Violent Reaction *DO NOT POUR WATER INTO ACID *Perchloric acid vapor can form explosive compounds within fume hood ducts. *Hydrofluoric acid can result in severe burns to the skin and lungs
Corrosive/Bases-Organic/Caustic 	▪ Diamine ▪ Hydroxylamine ▪ Tetramethylethylamine ▪ Triethylamine	Store in a separate cabinet, preferable with ventilation, corrosive cabinet, or storage with a secondary container, away from potential water sources (DO NOT store under the sink).	▪ Acids ▪ Flammable liquids ▪ Flammable solids ▪ Inorganic Bases ▪ Poisons/Toxins	▪ Gas Generation ▪ Heat ▪ Violent Reaction
Corrosive/Bases Inorganic/Caustics 	▪ Ammonium Hydroxide ▪ Calcium Hydroxide ▪ Potassium Hydroxide ▪ Sodium Hydroxide	Store in a separate cabinet, preferably with ventilation, corrosive cabinet, or storage area with a secondary container, away from potential water sources (DO NOT store under the sink). Store solutions of inorganic hydroxides in labeled polyethylene containers.	▪ Acids ▪ Flammable liquids ▪ Flammable solids ▪ Organic Bases ▪ Poisons/Toxins	▪ Gas Generation ▪ Heat ▪ Violent Reaction
Flammable Solids 	▪ Carbon ▪ Charcoal ▪ Magnesium ▪ Paraformaldehyde ▪ Phosphorus	Keep in a dry, cool area away from oxidizers and corrosives	▪ Acids ▪ Bases ▪ Oxidizers ▪ Poisons/Toxins	▪ Fire Hazard ▪ Violent Reaction

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Flammable Liquids 	▪ Acetonitrile ▪ Acetone ▪ Acetone liquids with flashpoints < 100 F ▪ Benzene ▪ Diethyl Ether ▪ Ethanol ▪ Ethyl Acetate ▪ Glacial Acetic Acid ▪ Methanol ▪ Tetrahydrofuran ▪ Toluene ▪ Xylene	Flammable storage cabinet or refrigerator rated for flammable/hazardous storage/explosion-proof. *Peroxide-forming chemicals must be dated upon delivery and opening (two dates).	▪ Acids ▪ Bases ▪ Reactives ▪ Poisons/Toxins	▪ Heat ▪ Fire Hazard ▪ Violent Reaction
Poisons/Toxins 	▪ Acrylamide ▪ Carbon Tetrachloride ▪ Chloroform ▪ Cyanides ▪ Ethidium Bromide ▪ Formamide ▪ Heavy metal compounds (e.g., Cadmium, Mercury, Osmium, Oxalic Acid, Phenol, Formic Acid) ▪ *Hydrofluoric Acid - Hydrofluoric Acid is a highly acute poison ▪ 2- Mercaptoethanol Phenol ▪ Sodium Azide	Store in a dark, dry, ventilated, cool area in an unbreakable chemically resistant secondary container (polyethylene) * Store volatile toxins with evaporation rate above 1.0- (ether =1.0) in flammable cabinet. Store non-volatile liquid poisons in a refrigerator or cabinet; amounts less than 1 liter can be stored in a cabinet above bench level, ONLY if the cabinet has sliding doors (not swinging).	▪ Acids ▪ Bases ▪ Corrosives ▪ Flammable liquids ▪ Oxidizers ▪ Reactives Please consult Environmental Health and Safety (EH&S) for assistance prior to the use of poisonous/toxic chemicals. *Hydrofluoric Acid should be stored in an area accessible only by authorized personnel; do not store in glass; use plastic containers and secondary containment.	▪ Combustion ▪ Explosion Hazard ▪ Fire Hazard ▪ Generation of Toxic and Flammable Gas ▪ Heat ▪ Violent Reaction Chloroform explosively reacts with chemically reactive metals (e.g., Aluminum or Magnesium powder, Sodium, and Lithium), Strong Oxidizers, Strong Caustics (e.g., Alkalis), and decomposes in sunlight.
Explosives 	▪ Ammonium Nitrate ▪ Benzoyl Peroxide ▪ Diazoisbutylnitrile ▪ Nitro Urea ▪ Picric Acid ▪ Trinitroaniline ▪ Trinitrobenzene ▪ Trinitrobenzoic Acid ▪ Trinitrophenol ▪ Trinitrotoluene ▪ Urea Nitrate	Store in a secure location away from other chemicals; store in an area away from friction or shock.	Please consult the Safety Data Sheets (SDSs) and EH&S prior to the use of any explosive.	▪ Explosion Hazard ▪ Friction ▪ Heat ▪ Shock ▪ Violent Reaction
Oxidizers 	▪ Ammonium Persulfate ▪ Benzoyl Peroxide ▪ Bromates ▪ Chlorates ▪ Ethyl Acetate ▪ Ferric chloride ▪ Iodine ▪ Nitrates ▪ Peroxides ▪ Perchlorates ▪ Permanganates ▪ Potassium Dichromate ▪ Sodium Hypochlorite ▪ Super Oxides	Store in a secondary containment separately from combustibles and flammable materials.	▪ Combustibles ▪ Flammable ▪ Organic Materials ▪ Reducing Agents	▪ Fire hazard ▪ Gas Generation ▪ Toxic Gas

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Peroxide Formers 	▪ Acetals and Ketals, especially Cyclic Ethers and those with primary and/or secondary Alkyl groups ▪ Aldehydes (e.g., Acetaldehyde, Benzaldehyde) ▪ Acrylonitrile ▪ Butylated Hydroxytoluene (BHT) ▪ Dienes Tetrahydrofuran ▪ Dioxane ▪ Isopropyl Alcohol Ethers (e.g., Diethyl ether, Isopropyl Ether) ▪ Isopropyl Ether Vinyl and Vinylidene compounds	Store in airtight bottles, away from light and heat in a dark, cool dry area; avoid using containers with loose-fitting lids and ground glass stoppers; crystallization, discoloration, and formation or deposition of layers are signs of a peroxide former may have become shock sensitive; DO NOT use or move such containers: contact EH&S; all bottles of peroxide-forming chemicals MUST HAVE the received date marked on the container; when the bottle is first opened, the container must be marked with the date opened.	Always consult the SDS and EH&S prior to the use of any peroxide-forming chemical.	▪ Explosion Hazard ▪ Combustion ▪ (Exothermic Reaction) ▪ Shock Sensitive ▪ Violent Reaction If an old or expired container of a peroxide-forming chemical or reactive is found, DO NOT move it. Contact EH&S ext. 3-3531 for assistance in disposing of the container.
Water Reactive 	▪ Alkali Metal Hydrides ▪ Lithium Metals ▪ Potassium Metals ▪ Sodium Borohydride ▪ Sodium Metals	Store in a dry, cool area away from potential spray from fire sprinklers and other water sources (DO NOT store under the sink) Label this area for water-reactive storage	▪ Aqueous solutions ▪ Oxidizers Please consult the Safety Data Sheet (SDS) and EH&S prior to the use of water-reactive chemicals.	▪ Heat ▪ Violent Reaction
Flammable Compressed Gases 	▪ Acetylene ▪ Arsine ▪ Butane ▪ Ethane ▪ Germane ▪ Hydrogen ▪ Propane ▪ Methane ▪ Silane	Handle flammable compressed gases in a chemical hood. Store in a well-ventilated area; store away from oxidizers, open flames, sparks, and other sources of heat ignition. Post NO SMOKING signs around storage room(s); flammable gases stored outdoors where ambient temperatures exceed 125 deg F (51.7 deg C) shall be protected from direct sunlight. Use a spark-proof wrench to attach regulators and make other connections; install a flame/flash arrestor at the regulator outlet flow valve.	▪ Oxidizers ▪ Toxic Compressed Gases	▪ Fire Hazard ▪ Explosion Hazard
Oxidizing Compressed Gases 	▪ Chlorine ▪ Gas mixtures containing Oxygen higher than atmospheric concentrations ▪ Fluorine ▪ Oxygen ▪ Nitrogen oxides	Store oxidizers separately from flammable gas containers or combustible materials; the minimum separation requirement from these materials is 20 ft or a 5 ft noncombustible barrier with a fire-resistance rating of at least 30 minutes.	▪ Flammable Compresses Gases ▪ Toxic Compressed Gases	▪ Fire Hazard ▪ Explosion Hazard

		Clean equipment used for oxygen and nitrous oxide with oxygen compatible materials free from oils, greases, and other contaminants. Fluorine shall be handled in specially passivated containers and associated equipment		
Toxic Compressed Gases 	▪ Carbon Monoxide ▪ Hydrogen Chloride ▪ Hydrogen Sulfide ▪ Nitrogen Dioxide	Handle toxic compressed gases in a certified chemical fume hood. Indoor storage or use of toxic compressed gases shall be provided with a gas cabinet, exhaust enclosure, or gas room. Refer to the SDS information for additional guidance on the storage and compatibility requirements. Contact EH&S prior to working with toxic compressed gases.	▪ Flammable Compresses Gases ▪ Oxidizing Compressed Gases	Release of toxic gas Hydrogen Sulfide is a colorless, flammable, extremely hazardous gas with a "rotten egg" smell; Prolonged exposure may cause nausea, tearing of the eyes, headaches or loss of sleep, airway problems (bronchial constriction) in some asthma patients; possible fatigue, loss of appetite, headache, irritability, poor memory, dizziness, and slight conjunctivitis.
Strong Reducing Agents	▪ Acetyl Chloride ▪ Ferrous sulfide ▪ Maleic Acid ▪ Thionyl Chloride	Store in cool, dry, well-ventilated locations. Water-reactive. Segregate from all other chemicals.	Please consult with the specific SDS for the chemical and EH&S prior to working with a strong reducing agent.	Please consult with the specific SDS for the chemical and EH&S prior to working with a strong reducing agent.

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Carcinogens 	▪ Benzidine ▪ Benzene ▪ Beta-Propiolactone ▪ Beta-Naphthylamine ▪ Carbon Tetrachloride ▪ Methylene Chloride	Label all containers as "Cancer Suspect Agents" or the equivalent. Store according to the hazardous nature of the chemical, using appropriate security when necessary	Please consult with the specific SDS for the chemical and EH&S prior to working with a carcinogen.	Please consult with the specific SDS for the chemical and EH&S prior to working with a carcinogen.
Teratogen 	▪ Aniline ▪ Benzene ▪ Lead Compounds ▪ Mercury Compounds	Label all containers as "Suspect Reproductive Hazard" or "Reproductive Effecter" Store according to the hazardous nature of the chemical, using appropriate security when necessary	Aniline is incompatible with Nitric Acid and Hydrogen Peroxide. Please consult the specific SDS and EH&S prior to working with a teratogen.	Please consult with the specific SDS for the chemical and EH&S prior to working with a teratogen.
General Stock Chemicals	▪ Agar ▪ Most non-reactive salts ▪ Salt Butter ▪ Sodium Bicarbonate ▪ Sodium Chloride	Store on shelves, or laboratory benches or shelving preferably behind glass doors and below eye level with like chemicals	Please consult the specific SDS for the chemical and EH&S prior to working with general stock chemicals.	Please consult the specific SDS for the chemical and EH&S prior to working with general stock chemicals.