UNIVERSITÀ
DEGLI STUDI
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OPERATING PROCEDURE NO. 4

INCOMPATIBILITY

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Curated by:

Environment and Safety Office

INCOPATIBILITY

Purpose and scope

Before being transferred to authorized companies for transport/disposal, the waste is stored in a specific area called "**Temporary Storage**", where the grouping of waste is done by homogeneous categories. To reduce disposal costs and the volume of containers, it is important to group the substances to be eliminated as much as possible while respecting compatibility and the types of EWC codes. The laboratory technician, by evaluating the compatibility table and the relevant safety data sheets of the substances, will assess the possibility of combining compatible waste from laboratory activities in the same container, while keeping halogenated organic solvents separate from non-halogenated organic solvents.

Table of incompatibilities

The list provided is an exemplary and non-exhaustive list.

SUBSTANCE	***INCOMPATIBLE WITH***
(Concentrated) Nitric acid	Reacts violently with fuels and reducing agents, hydrogen sulfide, mineral spirits, amines and ammonia, bases, alkali metals, peroxides, and dichloroethane.
Acetic anhydride	Alcohols, chromic acid, amines, strong acids and bases, water, hydrogen peroxide, metal powders, potassium permanganate, anilines.
Activated carbon	All oxidizing agents, calcium hypochlorite.
Alcohols and Polyols	Nitric acid, perchloric acid, chromic acid, sulfuric acid, amines, benzoyl chloride.
Aluminum chloride	Water, alcohol, nitrobenzene, alkenes.
Ammonium chloride	Acids, alkalis, silver and its salts, aluminum.
Ammonium hydroxide	Strong oxidizers, acids, halogens, mercury, silver, hypochlorites, ethyl alcohol. It attacks copper, aluminum, zinc, and their alloys.
Ammonium nitrate	Acids, metal powders, aluminum, sulfur, chlorates, nitrates, finely powdered organic compounds, fuels, flammable liquids.
Anhydrous ammonia	Chloronitrobenzene, mercury, halogens, hypochlorites, iodine, bromine, fluorine, and halides. It attacks copper, aluminum, zinc, silver, cadmium, iron, and their alloys.
Aniline	Halogens, strong acids, acetic anhydride, sodium peroxide, alkali and alkaline earth metals, iron salts, zinc.

SUBSTANCE	***INCOMPATIBLE WITH***
Arsenic (materials containing it)	Acids, oxidizing agents (chlorates, dichromates, permanganates), silver nitrate, azides.
Azides	Water, acids, copper, lead, zinc, silver, magnesium, halogenated solvents. Do not heat.
Benzoyl chloride	Amines, alcohol, hydrochloric acid (can release phosgene), alkali and alkaline earth metals, dimethyl sulfoxide.
Benzoyl peroxide	Strong oxidizers, powdered metals, lithium aluminum hydride, amines, organic and inorganic acids, fuels. Heating above 103°C can create explosions; avoid friction and contact with paper and wood.
Bromo	Ammonia, acetylene, acetaldehyde, acrylonitrile, finely powdered metals (aluminum, mercury, titanium, iron, copper), alcohols.
Calcium	Water, halogenated hydrocarbons, acids, alkali hydroxides (lithium, sodium, potassium), lead chloride.
Calcium hypochlorite	Acids, amines, acetylene, carbon tetrachloride, iron oxide, methanol, ammonium salts. It reacts violently with ammonia, amines, and nitrogen compounds, posing an explosion hazard. It attacks many metals, forming explosive mixtures.
Carbon disulfide	Sodium, potassium, zinc, azides, amines, halogens.
Carbon tetrachloride	Sodium, potassium, aluminum, magnesium, barium, allyl alcohol, and oxidizing agents in general.
Chlorates	Ammonium salts, acids, metal powders, sulfur, finely powdered combustible substances.
Chlorine	Ammonia, acetylene, ether, butadiene, butane, benzene, gasoline, and other petroleum derivatives (methane, propane, ethane), hydrogen, sodium carbide, turpentine, and finely powdered metals.
Chlorine dioxide	Mercury, phosphorus, sulfur, potassium hydroxide.
Chloroform	Sodium, potassium, magnesium, aluminum, zinc, lithium, strong bases, and strong oxidizers.
Copper	Acetylene, azide, ethylene oxide, chlorates, bromates, iodates.
Copper sulfate	Acetylene, nitromethane, strong bases, magnesium, sodium, zirconium, hydrazine, hydroxylamine, powdered metals, strong reducing agents
Cyanides	Acids, alkalis, amines, alcohols, strong oxidizers, glycols, phenols, cresols, chloral hydrate, metal salts, iodine, peroxides.
Dichloroethane	Oxidizers, alkali metals, metal powders, nitric acid.
Dichloromethane	Aluminum and magnesium powders, strong bases, and strong oxidizers.
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, and halogens.
Fluorine	Organic compounds, water, nitric acid, reducing agents, ammonia, ethyl acetate.

SUBSTANCE	***INCOMPATIBLE WITH***
Hexane	Strong oxidizers, nitrogen tetroxide.
Hydrazine	Hydrogen peroxide, acids, halogens, metal oxides, and porous materials.
Hydrocarbons	Fluorine, chlorine, bromine, formic acid, chromic acid, sodium peroxide, peroxides, benzene, butane, propane, gasoline, turpentine.
Hydrofluoric acid	Ammonia (anhydrous or in aqueous solution), bases, acetic anhydride, aliphatic amines, alcohol.
Hydrogen peroxide	Chromium, copper, iron, most other metals and their salts, flammable liquids and other combustible products, aniline, nitromethane, and some strong acids such as sulfuric acid.
Hydrogen sulfide	Acetaldehyde, barium pentafluoride, chromium trioxide, copper, lead oxide, chlorine monoxide, sodium peroxide.
Iodine	Acetylene, and ammonia (anhydrous or in aqueous solution), other strong bases, acetaldehyde, antimony, lithium, potassium, metal powders, halides, oils. It rapidly corrodes rubber and plastics.
Mercury	Acetylene, azides, chlorine, chlorine dioxide, hydrogen, ammonia, alkali metals, ethylene oxide.
Metal aluminum	Water, acids, air, alcohol, metalloids oxides, sulfates, ammonium compounds, mercury compounds, alkaline salts, metal salts, halogens, sulfides, non-metal halides, alkaline hydroxides, halogenated hydrocarbons, oxidizing agents, nitrates, metal oxides, non-metal oxides.
Nitrites and Nitrates	Combustible and reducing materials, ethyl acetate.
Nitrocellulose/ Nitroparaffin	Alkaline materials, strong acids and strong oxidizers, amines, metals.
Organic peroxides	Acids (organic or mineral), most metals, and fuels (avoid friction and high temperatures).
Oxalic acid	Strong oxidant, silver and its compounds, alkali metals, bases, sodium hypochlorite, chlorates.
Oxygen	Various organic materials, fuels, and reducing agents.
Perchloric acid	Acetic acid, acetic anhydride, bismuth and its alloys, alcohol, paper, wood, fats, strong bases, metals, acetonitrile, sulfides, trichloroethylene. It can cause an explosion if heated. Contact with alcohols, glycols, or polyhydroxyl compounds generates explosive compounds.
Phosphorus (white/yellow)	Air, alkalis, oxidizing agents, sulfur, halogens, aldehydes.
Phosphorus pentoxide	Water, strong bases, perchloric acid, hydrofluoric acid, formic acid, potassium, sodium, ammonia, peroxides, magnesium.
Picric acid	Copper, lead, zinc, violent reaction with oxidizers (chlorates, nitrates) and reducing materials. It can explode if heated.
Potassium	Water, carbon tetrachloride, carbon dioxide, chloroform, dichloromethane.

SUBSTANCE	***INCOMPATIBLE WITH***
Potassium perchlorate	Sulfuric acid and other acids, acetic anhydride, bismuth and its derivatives, alcohol, paper, wood, fats, and organic oils.
Potassium permanganate	Glycerin, ethylene glycol, propylene glycol, sulfuric acid, hydroxylamine, combustible materials, powdered metals, peroxides, zinc, and copper.
Selenium and selenium fluorides	Oxidizing agents, strong acids, cadmium, chromic acid, phosphorus, and some metals (nickel, zinc, sodium, potassium, platinum).
Silver and salts	Acetylene, oxalic acid, tartaric acid, ammonia, hydrogen peroxide, bromoazide.
Silver nitrate	Acetylene, alkalis, ammonia, hydrogen peroxide, antimony, halides, alcohols.
Sodium	Water, halogenated hydrocarbons, phosphorus and its compounds, sulfur and its compounds.
Sodium azide	Lead, copper, silver, and other metals, potassium hydroxide, benzoyl chloride, acids, carbon disulfide, bromine. It can explode upon heating.
Sodium hypochlorite	Acids, ammonia, ethanol.
Sodium nitrate	Reducing agents, metal powders, carbon, aluminum oxide, phenol. It can cause the ignition of combustible materials. Do not heat solutions with other substances.
Sodium nitrite	Aluminum, ammonium compounds, amines, metal powders. It can cause the ignition of combustible materials.
Sodium peroxide	Water, acids, powdered metals, organic compounds (combustible and reducing materials).
Sulfur	Acids.
Sulfur	Halogens, phosphorus, sodium, tin, zinc, ammonium nitrate, ammonia
Sulfuric acid	Chlorates, chlorides, iodides, perchlorates, permanganates, peroxides and water, picrates, metal powders, fuels, phosphorus (III) oxides, anilines.
Tellurium and tellurium fluorides	Halogens, acids, zinc, cadmium.
Zinc metal	Acids, water, air, azides, sulfur, benzene and carbon derivatives, carbon disulfide, chlorinated ammonium compounds, halogens including hydrocarbons, halides of halogens, alkaline hydroxides, hydroxylamine, metals, alkaline oxides.

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