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### C. Incompatible Chemicals Partial Listing

#### Chemical Incompatible Chemicals

Acetic acid

Chromic acid, nitric acid, permanganates, and peroxides

Acetic anhydride

Hydroxyl containing compounds such as ethylene glycol, perchloric acid

Acetone

Concentrated nitric acid and sulfuric acid mixtures, hydrogen peroxide

Acetylene

Bromine, chlorine, copper, fluorine, mercury, and silver

Alkaline and alkaline earth metals such as powdered calcium, cesium, lithium, magnesium, potassium, sodium, aluminum, etc.

Carbon dioxide, chlorinated hydrocarbons, water, and the halogens (dry sand should be used to extinguish fires)

Aluminum and its alloys (particularly powders)

Acid or alkaline solutions, ammonium persulfate, water, chlorates, chlorinated compounds, nitrates, and organic compounds in nitrate/nitrite salt baths

Ammonia (anhydrous)

Bromine, calcium hypochlorite, chlorine, hydrofluoric acid, iodine, mercury, and silver

Ammonium nitrate

Acids, chlorates, chlorides, lead, metallic nitrates, metal powders, finely divided organics or combustibles, sulfur, and zinc

Ammonium perchlorate, permanganate, or persulfate

Combustible materials, oxidizing materials such as acids, chlorates, and nitrates

Aniline

Hydrogen peroxide or nitric acid

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Barium peroxide

Combustible organics, oxidizing materials, water, and reducing agents

Bismuth and its alloys

Perchloric acid

Bromine

Acetone, acetylene, ammonia, benzene, butadiene, butane and other petroleum gases, hydrogen, finely divided metals, sodium carbide, and turpentine

Calcium or sodium carbide

Moisture in air or water

Calcium hypochlorite

(Activated) ammonia or carbon containing materials

Carbon, activated

Calcium hypochlorite and all oxidizing agents

Chlorates or perchlorates

Acids, aluminum, ammonium salts, cyanides, phosphorous, metal powders, finely divided organics or other combustibles, sugar, sulfides, and sulfur

Chlorine

Same as bromine

Chlorine dioxide

Ammonia, hydrogen, sulfide, methane, phosphine, and organic materials

Chemicals Incompatible Chemicals

Chromic acid

Acetic acid (glacial), acetic anhydride, alcohols, combustible materials, flammable liquids, Glycerine, naphthalene, nitric acid, sulfur, turpentine, reducing agents, and oxidizing materials

Copper

Acetylene, hydrogen peroxide, sodium azide

Cumene hydroperoxide

Acids (mineral or organic)

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Cyanides

Acids or alkalis

Flammable liquids

Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, and the halogens

Fluorine

Most materials (isolate from everything)

Hydrocarbons such as benzene, butane, gasoline, propane, turpentine, etc.

Bromine, chlorine, chromic acid, fluorine, hydrogen peroxide, and sodium peroxide

Hydrofluoric acid or anhydrous hydrogen fluoride

Ammonia (anhydrous or aqueous)

Hydrocyanic acid or hydrogen cyanide

Alkalies, nitric acid, oxidizers

Hydrogen peroxide 3%

Chromium, copper, iron, most metals or their salts

Hydrogen peroxide 30% to 90%

Same as 3% hydrogen peroxide plus aniline, any flammable liquids, combustible materials, nitromethane, and all other organic matter including alcohols

Hydrogen sulfide

Fuming nitric acid or oxidizing gases

Iodine

Acetylene, ammonia (anhydrous or aqueous), and hydrogen-reducing materials

Lithium

Acids, moisture in air, water, oxidizers

Lithium aluminum hydride

Acids, chlorinated hydro-carbons, carbon dioxide, ethyl acetate, and water-powered limestone as extinguishing agent

Magnesium (particularly powder)

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Carbonates, chlorates, heavy metal oxalates or oxides, nitrates, perchlorates, peroxides, phosphates, and sulfates

Mercuric oxide

Sulfur, reducing agents

Mercury

Acetylene, alkali metals, ammonia, nitric acid with ethanol, oxalic acid, azides

Nitrates

Combustible and flammable materials, esters, phosphorous, sodium acetate, stannous chloride, water, and zinc powder

Nitric acid (concentrate)

Acetic acid, aniline, chromic acid, flammable gases and liquids, hydrocyanic acid, and hydrogen sulfide

Chemicals Incompatible Chemicals

Nitric acid

Alcohols and other oxidizable organic material, hydriodic acid (hydrogen iodide), magnesium or other metals, phosphorous, and thiophene

Nitrites

Potassium or sodium cyanide, reducing agents

Oxalic acid

Mercury or silver

Oxygen (liquid or enriched air)

Flammable gases, liquids, or solids such as acetone, acetylene, grease, hydrogen, oils, and phosphorous

Perchloric acid

Acetic anhydrides, alcohols, bismuth and its alloys, grease, oils or any organic materials, reducing agents, paper, wood

Peroxides (organic)

Acids (mineral or organic), reducing agents

Phosphorous

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Chlorates and perchlorates, nitrates and nitric acid, organic materials, reducing agents, white phosphorous, air or oxygen in addition to others

Phosphorous pentoxide

Organic compounds, water, reducing agents

Picric acid

Ammonia heated with oxides or salts or heavy metals (particularly copper, lead, zinc) and friction with oxidizing agents and reducing agents

Potassium

Air (moisture and/or oxygen), water, carbon dioxide, carbontetrachloride

Potassium chlorate or perchlorate

Acids or their vapors, combustible materials, especially organic solvents, phosphorous, and sulfur

Potassium permanganate

Benzaldehyde, ethylene glycol, glycerine, and sulfuric acid

Silver

Acetylene, ammonium compounds, nitric acid with ethanol, oxalic acid, tartaric acid, fulminic acid, azides

Sodium

Carbon tetrachloride, carbon dioxide, and water

Sodium amide

Air (moisture and oxygen), water, oxidizers

Sodium chlorate

Acids, ammonium salts, oxidizable materials, and sulphur

Sodium hydrosulfite

Air (moisture) or combustible materials

Sodium nitrite

Ammonia compounds, ammonium nitrate or other ammonium salts, organic materials, friction

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Sodium peroxide

Acetic acid (glacial), acetic anhydride, alcohols, benzaldehyde, carbon disulfide, ethyl acetate, ethylene glycol, furfural, glycerine, methyl acetate, and other oxidizable substances, powdered metals, water, acids, organic materials

Chemicals Incompatible Chemicals

Sulfur

Any oxidizing materials

Sulfuric acid

Chlorates, perchlorates, permanganates, combustibles

Water

Acetyl chloride, carbides, chromic acid, phosphorous oxychloride, phosphorous pentachloride, sulfuric acid, and sulfur trioxide

Zinc chlorate

Acids or organic materials

Zinc (particularly powder)

Acids or water

Zirconium (particularly in powder form)

Carbon tetrachloride and other halogenated hydrocarbons, peroxides, sodium bicarbonate, water, and air

\*\*From Safety Engineering Standards, Industrial Indemnity Company and Prudent Practices in the Laboratory