

Explosive and Potentially Explosive Chemical Families

Acetylene or acetylide compounds:

N-Chloro-3-aminopropyne
Propiolic acid
Propynethiol

Acyl azides

Acetyl azide
Cyanodiazooacetyl azide
Phenylphosphonic azide chloride

Acyl hypohalites

Acetyl hypobromite
Hexafluoroglutaric dihypochlorite

Alkyl nitrates

Ethylidene dinitrate
Glyceryl trinitrate
Propyl nitrate

Alkyl perchlorates

Hexyl perchlorate
Ethyl perchlorate
1-Chloro-2-propyl perchlorate

Allyl trifluoromethanesulfonates

2-Chloro-2-propenyl trifluoromethanesulfonate

Amminemetal oxosalts

Ammonium hexanitrocobaltate
Bis(1,2-diaminoethane) diaquacobalt (III) perchlorate
Trihydrazine nickel (II) nitrate

Aromatic nitrates

Picric acid
Trinitrobenzene
Picryl sulfonic acid

Azides

Sodium azide
Lead azide
Hydrogen azide

Aziridines

1-Bromoaziridine

Azocarbonanes

1,1'-Azo-1,2-dicarbadecaborane

N-Azolium nitroimidates

Benzimidazolium 1-nitroimide
4-Nitroamino-1,2,4-triazole
2-(N-Nitroamino)pyridine N-oxide

Diazo compounds

2-Buten-1-yl diazoacetate
Diethyl diazomalonate
Dinitrodiazomethane

Diazonium carboxylates, perchlorates, salts, sulfates, tetrahaloborates, and, triiodides

Benzenediazonium-2-carboxylate
4-Aminobenzenediazonium perchlorate
6-chloro-2,4-dinitrobenzenediazonium sulfate
2-Nitrobenzenediazonium tetrachloroborate
4-Toluenediazonium triiodide

Difluoroaminoalkanoles

1,1-Difluorourea
Perfluoro-N-cyanodiaminomethane

Fluoro-nitro compounds

1-Fluoro-1,1-dinitrobutane
Fluorodinitromethyl azide

Fulminating metals

Lead fulminate
Gold fulminate
Silver fulminate

Furazan N-oxides

Dicyanofurazan N-oxide
4-Oximino-4,5,6,7-tetrahydrobenzofurazan N-oxide

Hydroxooxidiperoxochromate salts

1-Ammonium hydroxooxidiperoxochromate
Potassium hydroxooxidiperoxochromate

Iodine Compounds

Calcium 2-iodylbenzoate
Iodobenzene
2-Iodylvinyl chloride

Isoxazoles

3-Aminoisoxazole
3,5-Dimethylisoxazole

Metal Azide Halides

Chromyl azide chloride
Molybdenum diazide tetrachloride
Tungsten azide pentachloride

Metal Azides

Aluminum azide
Bis(cyclopentadienyl)tungsten diazide oxide
Mercury (I&II) azide
Sodium azide

N-Metal Derivatives

Cadmium nitride
Dibutylthallium isocyanate
Sodium amide

Metal Fulminates

Mercury (II) fulminate
Sodium fulminate
Tripropyllead fulminate

Metal Halogenates

Lead bromate

Metal Hydrides

Stibine (Antimony hydride)

Metal Nitrophenoxides

Lithium 4-nitrothiophenoxide
Potassium 4-nitrophenoxide

Metal Oxides

Bis (1-chloroethylthallium chloride) oxide
Magnesium chloride trioxide

Metal Oxohalogenates

Ammonium iodate
Lead acetate-lead bromate

Metal Oxometallates

Bis (benzene) chromium dichromate

Metal Perchlorates

Chromyl perchlorate

Metal Peroxides

Many transition metal peroxides are dangerously explosive.

Metal Peroxomolybdates

2-Potassium tetraperoxomolybdate
2-Sodium tetraperoxomolybdate

Metal Picramates

Palladium picramate
Uranyl picramate

Nitroaryl Compounds

N-Chloro-4-nitroaniline

Nitrogenous Base Nitrite Salts

Methylammonium nitrite

aci-Nitroquinonoid Compounds

Sodium 1,4-bis(aci-nitro)-2,5-cyclohexadienide

aci-Nitro Salts

Ammonium aci-nitromethanide
Dipotassium aci-dinitromethanide

Thallium aci-phenylnitromethanide

Nitroso Compounds

Dinitrosylnickel
Ethyl N-methyl-N-nitrosocarbamate
Potassium nitrosodisulfate

N-S Compounds

Disulfur dinitride
Potassium sulfurdiimide
Tetrasulfur tetranitride
Thiotriithiazyl nitrate

Organic Acids

Picric acid
Trinitroresorcinol

Organic Azides

Diazidomethyleneazine
Picryl azide
Vinyl azide

Organolithium Reagents

o-Trifluoromethyl phenyllithium
m-Bromo phenyllithium

Organomineral Peroxides

Bis(triethyltin) peroxide
Diethylhydroxotin hydroperoxide

Oximes

Bromoacetone oxime
Hydroxycopper glyoximate
Potassium cyclohexanehexone 1,3,5-trioximate

Oxosalts of Nitrogenous Bases

Ammonium tetranitroplatinate (II)
Diamminepalladium (II) nitrate
1,2-Diammonioethane nitrate

Ozonides

trans-2-Butene ozonide
Ethylene ozonide (1,2,4-trioxolane)
Trifluoroethylene ozonide

Perchlorate Salts of Nitrogenous Bases

Pyridinium perchlorate
Tetraethylammonium perchlorate

Perchloramide Salts

Barium perchloramide
Mercury (II) N-perchloryl benzylamide
Silver perchlorylamide

Perchloryl Compounds

2,6-Dinitro-4-perchlorylphenol
Perchloryl fluoride
N-Perchloryl piperidine

Peroxyacid salts

Calcium peroxodisulfate
Potassium tetraperoxomolybdate
Tetramethylammonium pentaperoxodichromate

Peroxyacids

Benzeneperoxyselemonic acid
Peroxyacetic acid
Peroxyformic acid

Peroxy carbonate esters

O-O-tert-Butyl isopropyl monoperoxy carbonate
Diallyl peroxydicarbonate
Dimethyl peroxydicarbonate

Phosphorus esters

Diethyl phosphite
Dibenzyl phosphorochloridate

Picrates

Nickel picrate (anhydrous)
S-7-Methylnonylthiuronium picrate
Sodium picrate

Platinum Compounds

Amminedecahydroxydiplatinum
cis-Diammineplatinum (II) nitrate
Trimethylplatinum hydroxide

Poly(dimercuryimmonium) Compounds

Poly(dimercuryimmonium picrate)
Poly(dimercuryimmonium permanganate)
Poly(dimercuryimmonium trinitrobenzoate)

Polymerization (violent)

Acrylic acid
Ethylene oxide
Vinyl acetate

Polynitroalkyl Compounds

Dinitroacetonitrile
Hexanitroethane
Potassium trinitromethanide

Polynitroaryl Compounds

5,6-Dinitro-2-dimethyl aminopyrimidinone
4-Nitro-1-picryl-1,2,3-triazole
2,4,6-Trinitrotoluene

Silver Compounds

Silver nitride (fulminating silver)
Disilver ketenide
Phenylsilver
Silver azide
Silver Osmate

Strained-Ring Compounds

2-Azatricyclo[2.2.10^{2,6}]hept-7-yl perchlorate
Dicyclopropyldiazomethane
Prismane

Tetrazoles

5-Aminotetrazole
Silver and mercury salts of 5-nitrotetrazole
Tetrazole

Triazoles

3-Diazo-5-phenyl-3H-1,2,4-triazole
4-Hydroxy-3,5-dimethyl-1,2,4-triazole
1,2,3-Triazole

Chemicals that May Explode due to Over-pressurized Containers

(From M.J. Pitt and E. Pitt, *Handbook of Laboratory Waste Disposal*, Ellis Horwood Publisher, UK, 1985. Formic acid and phenol have been added to the list.) Note: This list may not be all-inclusive.

Aluminum chloride
Aluminum lithium hydride
Ammonia solution
Ammonium hydroxide
Ammonium persulfate
Anisyl chloride
Aqua regia
Benzenesulphonyl chloride
Bleach
Bleaching powder
Calcium carbide
Calcium hydride
Calcium hypochlorite
Chloroform
Chromic acid
Cumene hydroperoxide
Cyclohexene
Diethyl pyrocarbonate
Dimethylamine
Formic Acid
Hydrogen peroxide
Lauroyl peroxide
Lithium aluminum hydride
Lithium hydride
Nitric acid
Nitrosoguanidine
Peracetic acid
Phenol
Phosphorus trichloride
Potassium Persulphate
Silicon tetrachloride
Sodium borohydride
Sodium dithionite
Sodium hydride
Sodium hydrosulphite
Sodium hypochlorite
Sodium peroxide
Sodium persulphate
Thionyl chloride
Urea peroxide
Zinc