



Guidelines for Managing Potential Peroxide Forming Chemicals

Some common groups of chemicals can form peroxides once exposed to oxygen. These general categories of chemicals include Aldehydes, Ketones, Ethers, Alkenes and Alkali metals. Once peroxides form, these chemicals may become extremely sensitive to thermal or mechanical shock and may explode.

- 1) Potential peroxide forming chemicals containers should be marked with the date(s) that they are received and opened.
- 2) The best method for managing potential peroxide forming chemicals is to purchase them in quantities that will allow them to be completely used before they have to be tested for formation of peroxides and/or before their expiration dates. Most potential peroxide forming chemicals have a shelf life of 18 months if **not opened** and 12 months once **opened and exposed to air**, unless noted otherwise.
- 3) Once opened, potential peroxide forming chemicals should be periodically tested for the formation of peroxides. Do not test or treat any peroxide forming chemical if there are any visible crystals, or a precipitate or oily viscous layer is present. One easy testing method is to use peroxide test strips available from a number of vendors, including Lab Safety Supplies. Potassium Iodide or Sodium Iodide may also be used to test for the presence of peroxides in most organic solvents.

To test using the Iodide method: Prepare a fresh solution of 100 mg of the sodium or potassium iodide dissolved in 1 ml of glacial acetic acid. Add 1 ml of the solvent to the iodide solution.

Results:

Iodide Test Color	Testing Strips Values	What to do
Slight yellow	0-30 ppm	Stabilize with an inhibitor (hydroquinone, t-butyl catechol or ferrous sulfate) (between 1 and 250 ppm or about 0.1 mg inhibitor/ Liter of solvent)
bright yellow	30-80 ppm	May pose a hazard if attempt to stabilize. Tag the container for EH&S Hazardous Waste pickup.
dark yellow/red	> 80 ppm	Do not attempt to stabilize. Tag the container for EH&S Hazardous Waste pickup



4) Potential peroxide forming chemicals that are past their expiration dates and/or safe shelf lives automatically become hazardous waste and are subject to hazardous waste regulations and management practices, unless documented that they have been tested and inhibited.

List of Common Peroxidizable Chemicals

Chemicals that may form peroxides without concentration: (3 month storage limit)

Divinyl ether	Potassium metal
Divinyl acetylene	Sodamide
Isopropyl ether	Vinylidene chloride (1,1-DCE)
Potassium amide	

Chemicals that may form peroxides upon concentration: (12 month storage limit)

Acetal	Dicyclopentadiene
Acetaldehyde	Dioxane
Acrolein	Diethyl ether
Alcohols (primary, secondary)	Diethylene glycol dimethyl ether (Diglyme)
Alcohols (allylic, benzylic)	Ethylene glycol dimethyl ether (Glyme)
Alkly-substituted cycloaliphatics	Furan
Cumene	Grignard reagents (ether solvents) Methyl acetylene
Cycloheptanone	Methyl cyclopentane
Cyclohexanone	Methyl isobutyl ketone (MIBK)
Cyclohexene	Tetrahydrofuran
Cyclopentene	Tetrahydronaphthalene
Cyclopentanone	Vinyl Ethers
Diacetylene	

Chemicals that may autopolymerize as a result of peroxide accumulation: (12 month storage limit)

Acrylic acid	Tetrafluoroethylene
Acrylonitrile	Vinyl acetate
Butadiene	Vinylacetylene
Chloroprene	Vinylchloride
Chlorotrifluoroethylene	Vinylpyridine
Methyl methacrylate	Vinyladiene chloride
Styrene	