ENVIRONMENTAL HEALTH AND SAFETY | HAZARDOUS MATERIALS

Peroxide Forming Chemicals

Safety Practices for Peroxide Forming Chemicals

- Purchase peroxide formers with inhibitors added by the manufacturer.
- Use oxygen exclusion practices such as purging with inert gases or sealing containers with Parafilm.
- Periodically inspect the container for cloudiness or formed crystals in solution. If any of these are present do not open or move the container. Contact Environmental Health and Safety (EHS) to dispose of it immediately.

Proper Labeling of Peroxide Forming Chemicals

All peroxide forming chemicals need to be labeled with the following dates which will help improve management of peroxide formers:

- The date the container was received by the laboratory.
- The date the container was opened, if appliable.
- The expiration date for the container.

Below is an example of a label filled out for Vinyl chloride received and opened on July 1, 2024. Vinyl chloride is a Class C peroxide forming chemical and has an expiration date of three months once opened.

Peroxide Forming Chemical	
Date Received	7-1-2024
Date Opened	7-1-2024
Expiration Date	10-1-2024

Peroxide forming chemical labels can be requested from Environmental Health and Safety at ehs.hazmat@cuanschutz.edu.

Classification of Peroxide Forming Chemicals

*** This is not an exhaustive list and there may be other peroxide formers not listed here. Consult with the chemical manufacturer for definitive guidance and storage timelines. ***

Class A: Peroxides derived from the following compounds may explode without concentration. **Discard within three months of opening or one year of receipt.**

- Butadiene
- Chlorobutadiene (Chloroprene)
- Divinyl acetylene
- Potassium amide
- Sodium amide (sodamide)
- Isopropyl ether
- Tetrafluoroethylene
- Vinylidene chloride
- Potassium metal

Class B: Peroxide formers upon concentration (distillation/evaporation). **Discard within three months of opening or one year of receipt.**

- Acetal
- Acetaldehyde
- Allyl ethyl ether
- Allyl phenyl ether
- Allyl vinyl ether
- 1-Allyloxy-2,3-epoxypropane
- Benzyl-1-naphthyl ether
- Benzyl butyl ether
- Benzyl ethyl ether
- Bis(2-ethoxyethyl)ether
- Bix(2-ethoxymethyl)ether
- 2-Butanol
- Buen-3-yne
- Butyl ethyl ether
- Butyl formate
- Butyl vinyl ether
- 1-Chloro-2,2-diethoxyethane
- 2-Chloroacrynitrile
- 2-Chloroethyl vinyl ether
- Cinnamaldehyde
- Crotonaldehyde
- Cumene
- Cyclohexene
- Cyclooctene
- Cyclopentene
- Cyclopropyl methyl ether
- Diacetylene
- Decahydronaphthalene
- Diethylene glycol dimethyl ether (diglyme)
- Diethyl ether
- Diethyl fumatate
- Diethylketene
- 2,3-Dihydrofuran
- 2,3-Dihydropyran
- 1,1-Dimethoxyethane
- 1,2-Dimethoxyethane
- 2,2-Dimethoxypropane
- 3,3-Dimethoxypropane
- 2,2-Dimethyl-1,3-dioxolane
- 2,6-Dimethyl-1,4-dioxane
- 1,3-Dioxane
- 1,4-Dioxane
- 1,2-Dioxep-5-ene
- 1,3-Dioxol-4-3n-2-one
- Dipropoxymethane
- Dipropylether
- Di(2-propynyl)ether
- 1,2-Epoxy-3-isopropoxy propane
- 1-Ethoxy-2-propyne
- 2-Ethoxyethanol
- 2-Ethyl butanal
- Ethyl isopropyl ether
- Ethyl propenyl ether
- Ethyl vinyl ether
- 2-Ethylacrylaldehyde oxime
- Ethylene glycol dimethyl ether (glyme)
- Isopropoxypropionitrile
- Isopropyl alcohol
- Isopropyl propyl ether
- Isopropyl vinyl ether
- Isovaleraldehyde
- Limonene
- 1,5-p-Mentadiene
- Methoxy-1,3,5,7-cyclooctatetraene
- 1-Methoxyethanol
- 2-Methoxyethyl vinyl ether
- Methyl acetylene
- Methyl cyclopentane
- 4-Methyl-1,3-dioxane
- 2-(1-Methyleptyl)-4,6-dinitophenyl ether
- Methylisobutyl ketone
- 2,3-Methyl-2-methylene butanal
- 4-Methyl-2-pentanone
- 2-Methyltetrahydrofuran
- Methyl vinyl ether
- 2-Penten-4-yn-3-ol
- a-Pentylcinnamaldehyde
- 2-Propanol
- Propionaldehyde
- 2-Propyne-1-thiol
- Sodium ethoxyacetylide
- 1,1,2,3-Tetrachloro-1,3-butadiene

Decalin
Dially ether
Dibenzyl ether
p-Dibenzyloxybenzene
1,2-Dibenzyoxyethane
Dibutyl ether
Dicyclopentadiene
1,1-Diethoxyethane
1,2-Diethoxyethane
Diethoxymethane
3,3-Diethoxypropene
2-Ethylhexanal
2-Ethylhexyl vinyl ether
2-Furaldehyde
Furan
4,5-Hexadien-2-yl-1-ol
2,4-Hexadienal
2,5-Hexadiyn-1-ol
2-Hexanal
Indole-2-carboxyaldehyde
Isobutyl vinyl ether
Isobutyraldehyde
Tetrahydrofuran
Tetrahydronaphthalene
Tetrahydropyran
Tetralin
1,3,3-Trimethoxypropene
3,3,5-Trimethyl-2-cyclohexen-1-one
4-Vinylcyclohexene
Vinyl ethers

Class C: Unsaturated materials, especially those of low molecular weight, tend to polymerize violently and hazardously due to peroxide initiation. **Discard within three months of opening or one year of receipt.**

Acrylic acid
Acrylonitrile
1,3-Butadiene
Chlorotrifluoroethylene
Methyl methacrylate
Styrene
Tetrafluoroethyelne
Vinyl acetate
Vinyl acetylene
Vinyl chloride
Vinyl pyridine
Vinylidiene chloride

NOTE:30% Hydrogen Peroxide is not considered a peroxide forming chemical and therefore does not need a peroxide forming chemical label.

From: *Prudent Practices in the Laboratory*, National Academy Press, 2011, and other sources.