COLGATE UNIVERSITY

Peroxide-Forming Chemical Safety Program

Certain laboratory chemicals form peroxides upon exposure to oxygen in air. Over time, some chemicals will continue to build peroxides to potentially dangerous levels while others accumulate a relatively low equilibrium concentration of peroxides. This becomes dangerous only after being concentrated by evaporation or distillation. Peroxide-forming chemicals may explode violently when subjected to thermal or mechanical shock. To prevent accidents, it is important that information on the age of peroxide-forming chemicals be maintained and that these chemicals are tested or disposed of on a regular basis. The Department of Environmental Health and Safety (EHS) tracks all peroxide-forming chemicals upon receipt and checks their status at least every 3 months.

The peroxide-forming compounds listed in the tables below will be labeled as follows upon receipt:

Peroxide Forming Compound
Date Received _____
Date Opened _____

Test for peroxide formation or discard
within _____ months

The date received and peroxide formation test periodicity will be filled in by EHS upon initial receipt of the chemical. The date opened will be filled in by the peroxide-forming chemical user the first time the container is opened. These labels should also be placed on any other chemicals not listed below but known to be peroxide formers. The following peroxide-forming chemical groups and associated tests/disposal periods will be used. EHS reserves the right to to increase or decrease testing periodicity based upon whether a chemical is inhibited or not and the storage conditions of the container.

Group A: Chemicals that form explosive levels of peroxides without concentration (distillation or evaporation)

EHS will test or dispose of Group A chemicals within 3 months of opening the container and every 3 months thereafter. EHS will test or dispose of unopened Group A chemicals within 18 months of receipt or upon manufacturer expiration date, whichever comes first.

Butadiene (liquid)	106-99-0
Chlorobutadiene (Chloroprene)	126-99-8
Divinyl acetylene	821-08-9
Isopropyl Ether	108-20-3
Potassium Amide	17242-52-3
Potassium Metal	7440-09-7
Sodium Amide (Sodamide)	7782-92-5
Tetrafluoroethylene	116-14-3
Vinylidene Chloride	75-35-4

Group B: Chemicals that form explosive levels of peroxides on concentration (distillation or evaporation)

EHS will test or dispose of stabilized Group B chemicals within 6 months of opening the container and every 6 months thereafter. EHS will test or dispose of unopened Group B chemicals within 2 years of receipt or upon manufacturer expiration date, whichever comes first.

2-Butanol	78-92-2
2-Hexanol	626-93-7
2-Pentanol	6032-29-7
Acetal	105-57-7
Isopropyl Benzene (Cumene)	98-82-8
Cyclohexene	110-83-8
Cyclooctene	931-87-3
Cyclopentene	142-29-0
Diacetylene	460-12-8
Dicyclopentadiene	77-73-6
Diethylene Glycol Dimethyl Ether (Diglyme)	111-96-6
Diethyl Ether	60-29-7
Dioxane	123-91-1
Ethylene Glycol Dimethyl Ether (Glyme)	110-71-4
Furan	110-00-9
Methyl Acetylene (Propyne)	74-99-7
Methyl cyclopentane	96-37-7
Methyl Isobutyl Ketone	108-10-1
Tetrahydrofuran (THF)	109-99-9
Tetrahydronaphthalene	119-64-2
Vinyl Ethers	109-93-3
Other Secondary Alcohols	

Group C: Chemicals which may autopolymerize as a result of peroxide accumulation

EHS will test or dispose of Group C chemicals within 12 months of opening the container and every 12 months thereafter. EHS will test or dispose of unopened Group C chemicals within 18 months of receipt or upon manufacturer expiration date, whichever comes first.

Do not store inhibited chemicals in this group under inert atmospheres.

Acrylic Acid	79-10-7
Butadiene (gas)	25339-57-5
Chlorotrifluorethylene	79-38-9
Ethyl Acrylate	140-88-5
Methyl Methacrylate	80-62-6
Styrene	100-42-5
Vinyl acetate	108-05-4
Vinyl chloride	75-01-4
Vinyl pyridine	1337-81-1

Group D: Potential Peroxide Forming Chemicals

EHS will test or dispose of inhibited Group D chemicals within 12 months of opening the container and every 12 months thereafter. EHS will test or dispose of unopened Group D chemicals within 2 years of receipt or upon manufacturer expiration date, whichever comes first.

1-octene	111-66-0
Benzyl ether	103-50-4

Chloromethyl methyl ether	107-30-2
cis-4-methyl 2-pentene	691-38-3
Cyclooctene	931-87-3
Diethoxy benzene	122-95-2
Diethyl acetal	2032-35-1
Ethyl vinyl ether	109-92-2
Ethylene glycol monoethyl ether	9004-74-4
Isophorone	78-59-1
Tert-butyl methyl ether	1634-04-4

The level of peroxides will be tested by EHS using peroxide test strips. Peroxide level assessments are based on laboratory prudent practices and hazardous waste disposal service provider criteria. EHS peroxide testing assessment levels are as follows:

Peroxide Level	Color Code	Assessment
<5 ppm	Green	Considered safe for general use
5 – 10 ppm	Yellow	Not recommended for distilling or evaporating
>10 ppm	Red	Avoid handling and contact EHS for safe disposal

Peroxide Forming Chemical Purchases

- If safer alternatives are available, do not purchase or use high-risk peroxide-forming chemicals without prior approval from EHS.
- Peroxides can build up over time as the solvent evaporates and/or air seeps into the bottle. If possible, purchase material that contains an appropriate peroxide inhibitor such as BHT (butylated hydroxytoluene). If non-inhibited material must be stored, then the material should be stored under an inert atmosphere.

Peroxide Forming Chemical Storage and Handling

- Do not store peroxide-forming materials in clear glass bottles as light can accelerate the chemical reactions that form peroxides. It is recommended that transparent amber glass bottles are used. Never store the material in a metal can or any container that must be opened in order to see the contents inside.
- Do not store peroxide-forming chemicals near heat, sunlight, or ignition sources. Avoid places that undergo temperature variations that can cause the bottle to “breathe in” oxygen.
- Do not distill, evaporate or concentrate the material unless it has been tested for the presence of peroxides. Peroxides are usually less volatile than their parent material and tend to concentrate upon distillation.
- Never touch or attempt to open a container of a peroxide-forming liquid if there are crystals around the cap and/or in the bottle. Place the container in safe storage and contact EHS immediately.