Peroxide Forming Chemical Safety Program

Certain laboratory chemicals form peroxides on exposure to oxygen in air. Over time, some chemicals continue to build peroxides to potentially dangerous levels whereas others accumulate a relatively low equilibrium concentration of peroxide, which becomes dangerous only after being concentrated by evaporation or distillation. These peroxide forming chemicals may explode violently when subject 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 Colgate University 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 by EHS:

PEROXIDE FORMING COMPOUND
DATE RECEIVED_____
DATE OPENED _____
TEST FOR PEROXIDE FORMATION OR DISCARD
WITHIN__ MONTHS AFTER OPENING

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 test / disposal periods will be used:

Group A - Chemicals that form explosive levels of peroxides without concentration (distillation / evaporation)
Note: EHS will test or dispose of Group A chemicals within 3 months of opening 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.

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

Group B - Chemicals that form explosive levels of peroxides on concentration (distillation / evaporation)

Note: EHS will test or dispose Group B chemicals within 6 months of opening container and every 6 months thereafter. EHS will test or dispose of unopened Group B chemicals within 18 months of receipt or upon manufacturer expiration date, whichever comes first.

Chemical Name	CAS#
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	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

Note 1: EHS will test or dispose inhibited Group C chemicals within 12 months of opening container and every 12 months thereafter. EHS will test or dispose of uninhibited Group C chemicals within 24 hours of opening container. EHS will test or dispose of unopened Group C chemicals within 18 months of receipt or upon manufacturer expiration date, whichever comes first.

Note 2: Do not store inhibited chemicals in this group under inert atmospheres

Chemical Name	CAS#
Acrylic Acid	79-10-7
Butadiene	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

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 solvent evaporates and/or air seeps into the bottle. If possible, purchase peroxide forming chemicals that contain an appropriate peroxide inhibitor such as butylated hydroxytoluene (BHT). If non-inhibited material must be stored, then material should be stored under an inert atmosphere.

Peroxide Forming Chemical Storage and Handling

Do not store peroxide forming materials in clear glass bottles (light can accelerate the chemical reactions that form peroxides). It is recommended that an amber transparent bottle be used. Do not store the material in a metal can or other container that must be opened to see 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.