

Principal Investigator: _____

Date Approved: _____

Peroxide Forming Chemicals

Peroxide-forming chemicals (PFCs) are flammable organic liquids which are capable of forming potentially explosive R-O-O-R' peroxide bonds (where R = organic group) upon exposure to air or oxidizing impurities. Peroxides formed in a chemical container are particularly likely to accumulate within the threads of the screw cap, and **may explode** when subjected to heat, light, friction or mechanical shock (e.g. unscrewing the cap). It is particularly dangerous to allow these materials to evaporate to dryness, such as during distillation, leaving the crystals of peroxide on the surfaces of the container.



Personal Protective Equipment & Personnel Monitoring		
 Lab Coat	 Gloves	 Eye Protection
Flame-resistant lab coat.	Nitrile or chloroprene gloves typically provide adequate protection against minor splashes. Consult with your PI or supervisor to determine whether any materials involved in your process require alternative hand protection.	ANSI Z87.1-compliant safety glasses or goggles if a splash hazard is present.

Labeling & Storage

PFCs should be stored in a flammable storage cabinet with self-closing hinges or in a refrigerator rated for flammable storage. Containers greater than 1 gallon (4L) in size are not recommended. All PFCs must be stored away from combustible materials and oxidizers.

PFCs must be marked with a receiving date and opening date. They must be disposed of or tested **within 12 months** from the date of opening, **within 18 months** of the date of receipt (if unopened), or **by the expiration date** as specified by the manufacturer. Pre-made labels are available from EH&S.

If the receiving and opening date is not known, promptly dispose as hazardous waste.

Class A	Class B		Class C
Chemicals known to form explosive levels of peroxides without concentration	Chemicals known to present peroxide hazards upon concentration (distillation/evaporation)		Chemicals that may autopolymerize as a result of peroxide accumulation
<i>Testing frequency:</i> Every 3 months after opening; store under nitrogen, if practical	<i>Testing frequency:</i> Every 12 months after opening OR anytime before distillation		<i>Testing frequency:</i> Every 12 months after opening if inhibitors are present; uninhibited materials must be disposed after 24 hours
<i>Examples</i>	<i>Examples</i>		<i>Examples</i>
<ul style="list-style-type: none"> • Divinyl acetylene • Divinyl ether • Isopropyl ether • Sodium amide • Potassium amide • Potassium metal • Vinylidene chloride 	<ul style="list-style-type: none"> • Acetaldehyde • Benzyl alcohol • 2-Butanol • Cyclohexene • Cyclohexanol • Dicyclopentadiene • Diethyl ether • Dioxanes • Ethyl ether 	<ul style="list-style-type: none"> • Isopropyl alcohol • Geraniol • Methylcyclopentane • Methyl methacrylate • 3-Methyl-1-butanol • 4-Methyl-2-pentanol • 2-Propanol • Tetrahydrofuran • Other 2° alcohols 	<ul style="list-style-type: none"> • Acrylic acid • Butadiene • Chlorotrifluoroethylene • Methyl methacrylate • Styrene • Tetrafluoroethylene • Vinylacetylene • 2-Vinylpyridine
Assessing peroxide level results	<25 ppm Considered safe for general use	25-100 ppm Not recommended for distilling or concentrating	>100 ppm Avoid handling; contact EH&S for safe disposal

WARNING MAY FORM EXPLOSIVE PEROXIDE

Store in tightly closed original container. If crystals, discoloration or layering visible do not open - Contact EHS

Date Received: _____ Date Opened: _____

PEROXIDE TEST RESULTS

If > 100 ppm don't use, contact EH&S for disposal

Date: _____ Result: _____ ppm Date: _____ Result: _____ ppm

Date: _____ Result: _____ ppm Date: _____ Result: _____ ppm

Engineering Controls, Equipment, & Materials

Fume Hood

If your protocol requires handling PFCs outside of a fume hood, contact EH&S to determine whether alternative engineering controls or additional respiratory protection is warranted.

Cautions & Considerations

Static Electricity

Large containers of PFCs are discouraged given the strict limits on prolonged storage. If required due to high demand, all large containers should always be grounded, and should be bonded to the receiving container during transfer. Always transfer flammable chemicals from glass containers to glassware or from glass container/glassware to plastic. Transferring these types of chemicals between plastic containers or unbonded metal containers may lead to a fire hazard due to static electricity.

Housekeeping

Spills

Treat all spills of this material as a major spill. Notify others in the area of the spill, including your supervisor. Evacuate the location where the spill occurred. Call 911 and alert TWU DPS (940-898-2911 in Denton; 214-689-6666 in Dallas; 832-870-6128 in Houston). Report any exposure to EH&S at 940-898-4001. Remain on-site (at a safe distance) to provide detailed information to first responders.

Decontamination

Decontamination methods will vary based on the materials handled and equipment being used. Please review the chemical Safety Data Sheet for guidance on cleaning materials.

Waste

Refer to the TWU Chemical Hygiene Plan for details. Empty containers of PFCs can still pose a hazard, and may quickly evaporate to dryness. Containers should be triple rinsed; the first rinse should be collected for disposal as hazardous waste.

First Aid & Emergencies

Skin or Eye Contact

Remove contaminated clothing and accessories; flush the affected area with water. If symptoms persist, seek medical attention.

Inhalation

Move affected individual(s) into fresh air. Seek medical attention immediately.

Ingestion

Rinse mouth with water. If symptoms persist, seek medical attention.

