UCONN HEALTH

Office of the Vice President for Research
Environmental Health and Safety

LAB SPECIFIC OPERATING PROCEDURE (LSOP) for Peroxide Forming Chemicals

Principal Investigator (PI):	
Building:	**Lab(s) Covered by LSOP:**
Department:	**Lab Phone Number(s):**

SECTION 1. PHYSICAL & CHEMICAL PROPERTIES

The main hazard related to organic peroxides are their **fire and explosion hazards**. Organic peroxides **may also be toxic or corrosive.** Depending on the material, route of exposure (inhalation, eye or skin contact, or swallowing) and dose or amount of exposure, they could harm the body. Corrosive organic peroxides can also attack and destroy metals.

It is the double oxygen of the "peroxy" group that makes organic peroxides both useful and hazardous. The peroxy group is chemically unstable. It can easily decompose, giving off heat at a rate that increases as the temperature rises. Many organic peroxides give off flammable vapors when they decompose. These vapors can easily catch fire.

Most undiluted organic peroxides can catch fire easily and burn very rapidly and intensely. This is because they combine both fuel (carbon) and oxygen in the same compound. **Some organic peroxides are dangerously reactive**. **They can decompose very rapidly or explosively if they are exposed to only slight heat, friction, mechanical shock or contamination with incompatible materials.**

Organic peroxides can also be strong oxidizing agents. **Combustible materials contaminated with most organic peroxides can catch fire very easily and burn very intensely (i.e., deflagrate)**. This means that the burn rate is very fast: it can vary from 1 m/sec to hundreds of metres per second. Also the combustion rate increases as the pressure increases and the combustion (or reaction) zone can travel through air or a gaseous medium faster than the speed of sound. However, the speed of combustion in a solid medium does not exceed the speed of sound.

This is one characteristic that distinguishes deflagration from detonation. We mention these two terms because they are used in classifying organic peroxide formulations (see next question). **Deflagrations and detonations are similar chemical reactions except that in detonations the burn rate in a solid medium is faster than the speed of sound. This supersonic speed results in a shock wave being produced. They can transmit the shock wave at speeds of about 2,000 to 9,000 m/sec and is not dependent on the surrounding pressure. This is another difference between detonation and deflagration: deflagration rates increase as the pressure becomes greater.**

Explosive decomposition is a rapid chemical reaction resulting in almost instantaneous release of energy. This term includes both deflagration and detonation.

SECTION 2. OSHA's (GHS)-SDS INFORMATION

Chemical Name	GHS Pictogram(s)	Generic Chemical Definition

Peroxide Forming Chemicals		These are a group of chemicals that have an oxygen-to-oxygen bond (R–O–O–R). Care must be taken when handling inorganic or organic peroxides, since they tend to be unstable and can, depending on the compound, decompose violently. Some peroxides are used as reactants, but peroxides as contaminants in other chemicals are also a concern. **Peroxides that contaminate organic solvents are of particular concern.** Peroxides form slowly in some organic solvents, and as their concentrations increase they present a greater hazard. Should these compounds be needed, only the quantity needed for experiments should be ordered so that there is no need for storage. Organic peroxides are reactive chemicals and can be dangerous if mistreated or mishandled. Proper storage is critical to the safe handling and use of organic peroxides, particularly those requiring controlled temperature storage. **Improper storage could lead to an uncontrolled decomposition. The most important aspect of peroxide storage is temperature control.** An understanding of published temperatures and their relationship to peroxide safety and quality is essential.

OSHA's GHS Signal Word is (DANGER)

SECTION 3. PEROXIDE FORMING SOLVENTS (2) CATAGORIES DEFINED

A significant number of laboratory solvents can undergo **autoxidation** under normal storage conditions **to form unstable and potentially dangerous peroxide by-products.** This process is **catalyzed by light and heat and occurs when susceptible materials are exposed to atmospheric oxygen.** Molecular structure is the primary factor relating to a material's potential for hazardous peroxide formation.

Most overviews of potential peroxide-forming chemicals classify various materials into three categories, on the basis of peroxide formation susceptibility, each with general handling and use guidelines.

- **The two categories relevant to solvents are defined as solvents that pose a peroxide related safety risk without having to be pre-concentration (see Category 1. (Group A)/ Next section) and solvents that necessitate pre-concentration in order to form peroxides (see Category 2. (Group B)/following Group A section)**
- **Please note that the storage time indicated below are based on these solvents continually being stored in opaque containers and under inert atmospheric gases.**

Category 1. (Group A)

(e.g.) Isopropyl ether

Chemicals that form explosive levels of peroxides without concentration.

Severe peroxide hazard after prolonged storage, especially after exposure to air.

Test for peroxide formation before using or discard after 3 months.

Category 2. (Group B)

- **Acetal**
- **Acetaldehyde**
- **Benzyl Alcohol**
- **2-Butanol Chlorofluoroethylene**
- **Cumene (isopropylbenzene)**
- **Cyclohexene**
- **2-Cyclohexen-1-ol**
- **Cyclopentene**
- **Decahydronapthalene(decalin)**
- **Diacetylene(butadiyne)**
- **Dicyclopentadiene**
- **Diglyme**
- **Diethyl ether**
- **Dioxanes**
- **Ethylene glycol ether acetates**
- **Furan**
- **4-Heptanol**
- **2-Hexanol**
- **Methyl Acetylene**
- **3-Methyl-1-butanol**
- **Methyl-isobutyl ketone**
- **4-Methyl-2-pentanol**
- **2-Pentanol**
- **4-Penten-1-ol**
- **1-Phenylethanol**
- **Tetrahydrofuran**
- **Tetrahydronapthalene**
- **Vinyl Ethers**
- **Sec. Alcohols**

Peroxide hazards on concentration

Test for peroxide formation before distillation or evaporation.

Test for peroxide formation or discard after 1 year

The solvents most commonly used in the laboratory, such as;

- **Diethyl ether, tetrahydrofuran, cyclohexene, glycol ethers**, decalin and 2-propanol are shown in Group B of the previous section.
- These compounds produce organic peroxides that are significantly less volatile than the solvent in which they are formed, as a result, evaporative concentration or distillation can produce dangerous levels of peroxides.
- In fact, most Group B solvents are sufficiently volatile that **multiple openings of a single container can result in significant and dangerous peroxide concentration.**

General Handling Considerations for Peroxidizeable Solvents

All peroxide-forming solvents should be checked for the presence of any peroxides prior to distillation or evaporation.

Solvents containing low levels of free radical scavengers such as BHT should be used whenever the presence of the stabilizing species does not interfere with intended application.

Uninhibited materials should be stored with care and frequently checked for peroxide formation.

Peroxide-forming solvents should **be purchased in limited quantities** and older material in inventory should be preferentially selected for use.

Materials should be stored away from light and heat with tightly secured caps and labeled with dates of receipt and opening.

Periodic testing to detect peroxides should be performed and recorded on previously opened material.

Peroxide Detection for Peroxidizeable Solvents

A variety of methods are available to test for the presence of peroxides in organic solvents with the two most common tests described below.

100 ppm is widely used as a general control point with respect to minimum hazardous peroxide concentration in a solvent, however, this value lacks scientific validation and is likely too liberal or conservative depending on the solvent in question and intended application.

If there are **visible crystals, visible precipitate or an oily viscous layer present in the material, these are visual indicators of dangerous high peroxide levels, immediately contact your company's EH&S** (Environmental, Health and Safety) department or its equivalent, to manage this hazardous situation and to dispose of this material.

(e.g.) Quantofix® Peroxide Test Strips (Sigma-Aldrich Part # Z249254 and Z101680) can be used & in the presence of hydrogen peroxide the test paper turns blue. Quantofix® Peroxide test sticks can also be used for the determination of peracetic acid and other organic and inorganic hydroperoxides. To test for hydroperoxides in organic solvents, the test zone is wetted with one drop of water after evaporation of the solvent.

Interferences: In the pH range of 2-9, the accuracy of the determination is independent of the pH of the test solution. Buffer strongly acidic solutions with sodium acetate and adjust alkaline solutions to about pH 5-7 with citric acid. Falsely positive results can only be caused by strong oxidizing agents.

Storage: Avoid exposing the sticks to sunlight and moisture. Store unopened packs in refrigerator (+2 °C to +8 °C). Opened packs: store container in a cool and dry place.

Potassium Iodide Indicator-Add 0.5-1.0 ml of the sample solvent to an equal volume of glacial acetic acid containing about 0.1 g of sodium iodide or potassium iodide crystals. A yellow color indicates iodine formation via iodide oxidation by sample peroxide; a brown color indicates high concentration. A blank determination should be made particularly when color development is faint since iodide/acetic acid mixtures will, over time, turn a yellow - brown color due to air oxidation.

A more sensitive variation of the above method adds one drop of a saturated, aqueous starch solution to the sample solution. Starch and iodine combine to form a bright blue complex that is more easily visualized than the yellow color generated by iodine alone. **Dark blue solution color would be indicative of high peroxide concentration.**

SECTION 4. ADMINISTRATIVE CONTROLS

1.	**ALWAYS:** Refer to the Product Label or Material Safety Data Sheet (MSDS sections 7 and 9) for product specific Storage Temperature requirements and SADT. **ALWAYS:** Maintain product below the MAXIMUM Storage Temperature.

	ALWAYS: Have a facility safety protocol in place if the storage temperature reaches the emergency temperature, 10°C / 18°F below the SADT. **ALWAYS:** Practice First-In-First-Out (FIFO) Inventory Management.
2.	**First-In-First-Out (FIFO)** inventory management is essential due to the unique characteristics of organic peroxides. Customers should have a system to carefully control their inventories and use older product first to assure desired peroxide activity in end-use applications. A procedure for out-of-date product should be developed. The following shelf-life guidelines are provided to aid in inventory control.
3.	Lab-specific safety training must be provided by the principal investigator (PI) or other qualified personnel to all researchers working with Peroxide Forming Chemicals
4.	The PI must perform a Workplace Hazard Assessment **(WHA)** form for Laboratories at, **http://research.uchc.edu/wp-content/uploads/sites/1137/2015/09/workplace_hazard_assessment.pdf**
5.	Researchers must **not work alone** with Peroxide Forming Chemicals. Please note that UCONN Health/Storrs has a **Working Alone Policy,** found at **http://content.research.uconn.edu/pdf/uch/rcs/ehs/policy-workingalone2017.pdf**
6.	Documentation of training is required and satisfied upon review and sign-off of this LSOP and submission to EH&S for approval.
7.	In addition to reviewing this document, you must review the Safety Data Sheet **(SDS)** for Peroxide Forming Chemicals prior to use, and instruct your employees.
8.	Whenever possible, find **safer substitutes or reduce** the quantities of Peroxide Forming Chemicals.
9.	Experiments should be performed **during normal business hours** (e.g.) 8:00 am-5:00 pm Mon-Fri) if possible.
10.	Multiple transfers of small volumes/quantities of Peroxide Forming Chemicals are preferred over a single transfer of larger volumes/quantities.
11.	Any handling of Peroxide Forming Chemicals requires supervision from the Lab supervisor, PI or other experience employee.
SECTION 5.	**ENGINEERING CONTROLS**
12.	Chemical fume hoods must be running at over 90 linear feet/minute and tested by EH&S within the last year.
13.	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.
14.	Ensure that eyewash stations and safety showers are proximal to the workstation location and tested accordingly.
15.	EH&S certifies flow rates of fume hoods for UCONN Health, contact EH&S at 860-679-2723 for re-test.
16.	If the hood is not working properly, contact Facilities to repair the hood at 860-679-2125.
17.	Work with Peroxide Forming Chemicals – **the work must be conducted in a suitable/rated fume hood.**
18.	Sash height must be kept as low as possible to avoid escaping fumes and provide a physical barrier.
SECTION 6.	**PERSONAL PROTECTIVE EQUIPMENT** ***(At a minimum, the following PPE must be worn at all times.)***
	Eye and Face Protection
In case of eye contact-rinse thoroughly with plenty of water using an eyewash station for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses if possible.	
19.	Eye/face protection Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). ANSI Z87.1-compliant safety glasses with side shields, or chemical splash goggles.
20.	Ordinary prescription glasses will NOT provide adequate protection unless they also meet ANSI standard and have compliant side shields.
	Skin and Body Protection
Skin protection Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.	
21.	Lab coats are required when handling hazardous chemicals in the lab. Select the type of lab coat according to the substances at the specific workplace.
22.	Long pants, closed-toe/closed-heel shoes, covered legs, and ankles.

SECTION 7.	SPECIAL HANDLING & STORAGE REQUIREMENTS
	Conditions for safe handling
23.	Eliminate or substitute for a less hazardous material when possible.
24.	Design your experiment to use the least amount of material possible to achieve the desired result.
25.	Do not exceed the scale of procedures specified in Protocol/Procedure section without approval of the PI.
26.	Verify your experimental set-up and procedure prior to use.
27.	Know the location of the nearest eyewash, safety shower and fire extinguisher before beginning work.
28.	Upon leaving the work area, remove any personal protective equipment worn and wash hands.
29.	At the end of each project, thoroughly decontaminate the work area according to the material being handled.
	Conditions for safe storage
30.	**Maximum Storage Temperature:** The maximum storage temperature is the temperature below which the product can be stored safely, but at which it may lose assay if stored for long periods.
31.	**Minimum Storage Temperature:** The minimum temperature is the temperature above which the product can be stored safely, and below which freezing, crystallization or phase separation of the peroxide from the safety diluent increases the hazard. It is customarily listed only for those products that will exhibit this phenomenon.
32.	**Recommended (Preferred) Storage Temperature:** The recommended storage temperature is the best temperature for safe, longer-term storage and for preserving product quality.
33.	**Self-Accelerating Decomposition Temperature (SADT):** The SADT is the lowest temperature at which product in a typical package will undergo a self-accelerating decomposition. ➢ The reaction can be violent, usually rupturing the package, dispersing peroxide, liquid and gaseous decomposition products considerable distances. ➢ The heat generated might auto-ignite flammable vapors. There is generally a period of time after the SADT is reached and before the decomposition becomes violent. ➢ The length of time depends upon how much the SADT is exceeded, which can greatly accelerate the decomposition. ➢ The Emergency Temperature is 10°C / 18°F below the SADT. Under no circumstances should products be exposed to temperatures at or above the emergency temperature. ➢ Planned, preventive action should occur when this temperature is reached. ➢ If the SADT is reached, immediately evacuate the area and implement the facility emergency response plan. ➢ If decomposition occurs, it should be observed from a safe distance, taking only those measures necessary to preserve life and nearby property. ➢ Typically, the SADT is inversely proportional to package size. Larger packages will have a lower SADT due to a smaller surface-to-volume ratio that limits the dissipation of heat. ➢ Consult the product label and Safety Data Sheet (SDS) for product specific SADT data.
34.	**NFPA-432(02)PDF: Code for the Storage of Organic Peroxide Formulations (PDF)** NFPA 432 presents requirements for the safe storage of organic peroxide formulations. These criteria provide guidance that: ➢ Divides organic peroxide formulations **into five classes, with Class I being the most dangerous and Class V the least dangerous** ➢ Defines different types of allowable storage facilities ➢ Sets out fire safety requirements based on the material and facility class, including sprinkler protection requirements ➢ Provides rules for maintenance, operation, and electrical requirements The Annex material to the code includes a lengthy listed of recommended classifications for typical organic peroxide formulations. (Approx. 23 pp., 2002) This code shall apply only to commercially available organic peroxide formulations in U.S. Department of Transportation- or Canadian Ministry of Transport-approved packages. This code shall not apply to the storage of such formulations in process

areas where they are manufactured or used. This code does not apply to organic peroxide formulations that are capable of detonation in their normal shipping containers under conditions of fire exposure. Such formulations shall be handled and stored as Explosives 1.1 (formerly known as Class A explosives) in accordance with NFPA 495, Explosive Materials Code.

35. Organic Peroxide Shelf Life: The shelf life is the time period during which a peroxide must be used in order to realize desired, optimum activity in end-use applications.

- Organic peroxides are inherently unstable chemicals and therefore have a limited shelf-life, primarily depending upon the temperatures to which they are exposed.
- Typically, the **shelf-life period begins when the peroxide is delivered** to the customer and is primarily dependent upon storage temperature.

36. In accordance with US DOT 49CFR 173.21 and the UN Recommendations on the Transport of Dangerous Goods-Model Regulations (2.5.3.4.1),

- Organic peroxide formulations with a SADT of >50°C /122°F do not require controlled temperature transport.
- Ambient transport organic peroxides can be stored safely at or below a MAXIMUM storage temperature of 38°C / 100°F, however
- the RECOMMENDED storage temperature is below 30°C / 86°F to maintain product quality. Detached storage is preferred in a cool, well ventilated place out of direct sunlight.
- Organic peroxides must be stored away from combustibles and incompatible materials.
- Refer also to the National Fire Protection Association (NFPA) Code 432, Code for the Storage of Organic Peroxide Formulations for additional information.

37. In accordance with US DOT 49 CFR 173.21 and the UN Recommendations on the Transport of Dangerous Goods-Model Regulations (2.5.3.4.1),

- organic peroxide formulations with a SADT of < 50°C /122°F require controlled temperature transport. Transportation Emergency and Control Temperatures are derived from the SADT and are listed in the transport regulations for each specific product. Refer to the SDS (section 14), shipper'sBill of Lading or 49CFR173.225 for the required temperatures.
- The product-specific storage temperature for temperature controlled formulations is always AT or BELOW the transportation control temperature (refer to SDS or Product Label).
- At customer facilities, back-up or emergency refrigeration should be available in case primary refrigeration is lost.
- Emergency dry ice source(s) should be known in case of refrigeration failure.
- Temperature in storage areas should be monitored.
- Refrigeration systems should have at least a high temperature alarm to warn of loss of refrigeration, and preferably a secondary alarm set for the lowest Emergency Temperature of any peroxide in storage.
- **ALWAYS**: Refer to the Product Label or Material Safety Data Sheet (SDS section 7and 9) for product specific Storage Temperature and SADT.
- **ALWAYS**: Maintain product at or below the RECOMMENDED Storage Temperature.
- **ALWAYS**: Minimize exposure to ambient temperatures and prevent unnecessary exposure to sunlight.
- **UPON RECEIPT**: Promptly place product in a temperature controlled storage area.
- **ALWAYS**: Practice First-In-First-Out (FIFO) Inventory Management.

38. **When stored at or below the recommended storage temperatures in their original containers**;

- Organic peroxides will maintain activity in end-use applications for a minimum of three months after the date of delivery.
- Storage at temperatures higher than the published recommended temperatures and below the SADTs adversely affects product quality.
- The extent of assay change depends upon the temperature(s) and length of exposure.
- Product that has been exposed to temperatures greater than the recommended temperature for long periods of time should be analyzed to determine the assay and suitability for use. (Minor assay loss might mean simply making weight adjustments necessary for successful application, major loss might mean disposal instead of use.)
- First-In-First-Out (FIFO) inventory management is essential due to the unique characteristics of organic peroxides.
- Customers should have a system to carefully control their inventories and use older product first to assure desired peroxide activity in end-use applications.
- A procedure for out-of-date product should be developed.
- The following shelf-life guidelines are provided to aid in inventory control

39.

ORGANIC PEROXIDE FAMILY	SHELF-LIFE* (# of months after delivery)
DIPEROXYKETALS	6 Months
PEROXYDICARBONATES	3 Months

	PEROXYESTERS	6 Months
	DIACYL PREOXIDES (except benzoyl peroxide & benzoyl peroxide pastes)	6 Months
	· Benzoyl Peroxide · Benzoyl Peroxide Pastes	12 Months 6 Months (35-85°F) or 3 Months (86-100°F)
	KETONE PEROXIDES	6 Months (65-85°F) or 3 Months (86-100°F)
	DIALKYL PEROXIDES 12 Months	12 Months
	HYDROPEROXIDES	6 Months
	* Shelf-life when stored at or below recommended storage temperature.	
40.	Transportation Control Temperature: Per 49 CFR173.21, the transportation control temperature is the temperature above which a package of the material may not be offered for transportation. In general terms for all refrigerated products, this temperature is the maximum recommended temperature for transport and is listed in the DOT organic peroxide transportation table (49 CFR173.225) and appears on the shipper's bill of lading (BOL).	
41.	Transportation Emergency Temperature: Per 49 CFR173.21, the transportation emergency temperature is the temperature at which, due to imminent danger, emergency measures must be initiated. For all temperature controlled products, this temperature is set by the DOT to be 10°C below the SADT and is listed in the DOT organic peroxide transportation table (49 CFR173.225) and appears on the shipper's bill of lading (BOL).	
SECTION 8.	SPILLS, ACCIDENTS & EMERGENCY PROCEDURES	
42.	Call **911 or 7777** from landline if **Life Threatening** and call EH&S at **860-679-2723 for Non-Life Threatening** Spill Coordination efforts.	
43.	Evacuate the laboratory and inform others in the immediate area to leave the work area. Evacuate the laboratory calmly yet safely, and rally at the **Emergency Assembly Area (EAA)** as designated by the Fire Department	
44.	The **(EAA)** is a pre-determined safe zone for employees to meet during an emergency.	
45.	Upon evacuation, also try to **minimize damage; isolate/contain** if able. (e.g.) open hoods to accelerate dissipation in air, hit HVAC purge button to increase laboratory air changes, disconnect electrical sources etc.	
46.	Upon Evacuation, close door(s) to lab and post a "**NO ENTRY**" sign(s) or other warning information on the door.	
47.	The **Emergency Evacuation Attendants (EEA) are those who have been assigned** take roll call of employees and report to the **Emergency Evacuation Coordinator (EEC)**	
48.	No one shall be permitted to leave the **Emergency Assembly Area (EAA)** until the scene has been determined safe for re-entry by the On-Scene **Emergency Coordinator (EC)**-Senior Fire Department Official.	
49.	**Do not re-enter** the lab/area until instructed to do so by the On-Scene **Emergency Coordinator (EC)**-Senior Fire Department Official.	
50.	Should the **Emergency Assembly Area (EAA)** be compromised**, evacuees will be instructed by Emergency Evacuation Attendants (EEA's) or the Emergency Evacuation Coordinator (EEC) to re-locate to a secondary Emergency Assembly Area (SEAA)**	
51.	EH&S recommends that individual labs discuss emergency response and readiness at their laboratory meetings and practice drill. EH&S can aid in this effort along with Public Safety.	
52.	Report Spills, accidents which are also deemed non-life threatening or non-emergency situations to your respective PI/Supervisor and EH&S.	
SECTION 9.	FIRST AID PROCEDURES *(Have your SDS Available for First Responders)*	
First Aid- Eyes	1. Remove contact lenses (if applicable) 2. Forcibly hold eyelids open and flush eyes under eyewash for 15 minutes 3. If pain persists after 15 minutes, dial **911** 4. Keep flushing eyes until emergency personnel arrives 5. Report incident to PI/Supervisor and EH&S.	

First Aid- Skin	1. Remove contaminated clothing (if applicable) 2. Flush affected area(s) under safety shower for 15 minutes 3. If pain persists after 15 minutes, dial **911** 4. Keep rinsing affected area until emergency personnel arrives 5. Report incident to PI/Supervisor and EH&S. 6. Needle stick/puncture exposure-wash the affected area with antiseptic soap and warm water for 15 minutes.
First Aid- Inhalation	1. Move to fresh air 2. Dial **911** 3. Report incident to PI/Supervisor and EH&S.

SECTION 10. HAZARDOUS WASTE MANAGEMENT-(GENERAL)

48.	All hazardous wastes must be labeled with "Hazardous Waste" stickers or tags, use full chemical names to describe the waste (i.e. no chemical abbreviations or symbols), have 100% of the constituents by volume identified and be stored in containers with tight-fitting caps or lids, and be segregated by chemical compatibility.
49.	Hazardous wastes must be stored at or near a green (S.A.A.) aka "Satellite Accumulation Area" sign prior to disposal by EH&S.
50.	Hazardous wastes must accumulate under the control of the generator, with a container maintained in good condition, free of exterior residues on container or in the spill tray. All spills and residues must be immediately cleaned up.
51.	Hazardous wastes must be transferred within a chemical fume hood but then be removed for temporary storage with the generator's respective (SAA). When chemical waste is being transferred is the only time that it may remain open. Closed, means that no liquid will spill from a waste collection container, should the container be knocked over/inverted.
52.	All Peroxide Forming Chemicals solutions and contaminate solids will be collected and characterized by EH&S as chemical hazardous waste

SECTION 11. SPECIFIC PROCEDURE *(left blank intentionally; please see & follow instructions)*

(Document the Experiment Information with regard to use of** Peroxide Forming Chemicals**, too include the procedures for disposal of the waste and the selection and application of correct PPE)

Instructions As Follows:_____

_____
_____
_____
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SECTION 12. APPROVAL

I have reviewed, understand and agree to follow this LSOP regarding Peroxide Forming Chemicals. Failure to follow the LSOP and lab-specific training guidelines for research with Peroxide Forming Chemicals is a violation of the *University Health & Safety Policy* and *University Code of Conduct*. Further approval from the PI is required if any of the following events occur:

- A change in the agreed-upon experimental set-up is planned
- Signs of a failure in safety design or equipment are observed
- Signs or symptoms of a chemical exposure to any personnel are observed
- Unexpected and/or potentially dangerous experimental results occur (e.g., fire, uncontrolled buildup of heat and/or pressure, etc.)

PLEASE ENSURE THAT THIS LSOP AND THE SDS ARE REVIEWED, TRAINED UPON AND UNDERSTOOD BY END USERS. THIS FORM IS DESIGNED TO NOT ONLY PROVIDE UCONN HEALTH WITH RISK MITIGATION BUT FOR THE PRINCIPAL INVESTIGATOR AS WELL. PLEASE SEND A COPY OF THE COMPLETED LSOP TO EH&S FOR REVIEW AND APPROVAL. EH&S APPRECIATES YOUR COOPERATION WITH THIS MATTER.

Researcher Signature	Date	Trainer Signature	Training Date

SECTION 13. PRINCIPAL INVESTIGATOR CERTIFICATION	
I approve the contents of the lab-specific standard operating procedure listed above:	
PI Signature:	**Date:**
Date sent to EH&S for Review and Approval:	**Date:**