Wake Forest Baptist Health	**Standard Operating Procedure (SOP) Template**	

OXIDIZERS

Effective Date:	**12/2/2011**	**Revised Date:**	**2/1/2012**

INTRODUCTION

A Standard Operating Procedure (SOP) describes how your lab will handle a hazardous chemical safely, including the amount and concentration you will use, how you obtain or create the working solution, and special handling procedures, engineering controls, and personal protective equipment. Chemical-specific SOPs are found on the EH&S website.

Wake Forest Baptist Medical Center has created Standard Operating Procedures (SOPs) for several chemical hazard categories and some commonly-used chemicals. The SOP provides only standard information and requires customization for each lab.

The Occupational Safety and Health Administration (OSHA) requires a written SOP for any work with hazardous chemicals in laboratories. There are additional requirements for SOPs for particularly hazardous substances, or PHSs. These SOPs are an important part of the Chemical Hygiene Plan.

AUTHORIZED USE Oxidizers are compounds which are capable of reacting with and oxidizing (i.e., giving off oxygen) other materials. A well known example of oxidation is the process we know as corrosion, where the metal reacts with air to form the metal oxides referred to as "rust". Examples of common oxidizers used at WFUHS:

- chlorates
- chlorites
- dichromates
- hypochlorites
- nitrates
- nitrites
- perchlorates
- peroxides
- permangranates

GENERAL LAB RULES

1. No eating, drinking, smoking, handling contact lenses, or applying cosmetics in the laboratory.
2. Persons shall wear buttoned lab coat, long pants, safety glasses or goggles and appropriate gloves when working with hazardous chemicals.
3. Mouth pipetting is prohibited; mechanical pipetting devices are to be used at all times.
4. All procedures are performed carefully to minimize the creation of splashes or aerosols.
5. Wash hands
    - after handling chemicals materials,

- after removing gloves, and
- before leaving the laboratory.

6. Plastic ware should be substituted for glassware whenever possible

Add Lab Specific Rules Here

PURPOSE

Add Lab Specific Purpose Here

PHYSICAL HAZARDS

The primary hazard associated with this class of compounds lies in their ability to act as an oxygen source, and thus to readily stimulate the combustion of organic materials.

Classification System for Oxidizing Materials	
Class Rating	**Hazard Description**
Class 1	An oxidizing material whose primary hazard is that it may increase the burning rate of combustible material with which it comes in contact.

Class 2	An oxidizing material that will moderately increase the burning rate or which may cause spontaneous ignition of combustible material with which it comes in contact.
Class 3	An oxidizing material that will cause a severe increase in the burning rate of combustible material with which it comes in contact or which will undergo vigorous self-sustained decomposition when catalyzed or

HEALTH HAZARDS

Oxidizers pose a physical hazard due to their potential to add to the severity of a fire or to initiate a fire. In general, oxidizers are corrosive and many are highly toxic.

Acute Health Effects:

- Some oxidizers, such as **nitric acid** and **sulfuric acid** vapors, **chlorine**, and **hydrogen peroxide**, act as irritant gases. All irritant gases can cause inflammation in the surface layer of tissues when in direct contact. They can also cause irritation of the upper airways, conjunctiva, and throat.
- Some oxidizers, such as **fluorine**, can cause severe burns of the skin and mucus membranes. **Chlorine trifluoride** is extremely toxic and can cause severe burns to tissue.
- **Nitrogen trioxide** is very damaging to tissue, especially the respiratory tract. Symptoms from an exposure may be delayed for hours, but fatal pulmonary edema may result.
- **Osmium tetroxide** is also dangerous due to its high degree of acute toxicity. It is a severe irritant of both the eyes and the respiratory tract. Inhalation can cause headache, coughing, dizziness, lung damage, difficulty breathing, and may be fatal. Osmium tetroxide is regarded by many in the field as having "poor warning properties" because it is difficult to detect by smell or other means.

Chronic Health Effects:

- Nitrobenzene and chromium compounds can cause hematological and neurological changes.
- Compounds of chromium and manganese can cause liver and kidney disease. Chromium (VI) compounds have been associated with lung cancer.

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PERSONAL PROTECTIVE EQUIPMENT

EYE PROTECTION

- Safety glasses, goggles or face shields shall be worn during operations in which OXIDIZERS might contact the eyes (e.g., through vapors or splashes of solution).
- Ordinary (street) prescription glasses do not provide adequate protection. Adequate safety glasses must meet the requirements of the Practice for Occupational Education Eye and Face Protection (ANSI Z87.1-1989) and must be equipped with side shields.

HAND PROTECTION

- Use nitrile or neoprene gloves when working with OXIDIZERS.
- Be sure to consult a glove compatibility chart to ensure the glove material is appropriate for the particular chemical with which you are working.
- Laboratory personnel should thoroughly wash hands with soap and water before and immediately upon removal of gloves.

LAB COATS, ETC.

- Button lab coats, closed toed shoes, long pants and long sleeved clothing shall be worn when handling OXIDIZERS. Protective clothing shall be worn to prevent any possibility of skin contact with OXIDIZERS.

DESIGNATED AREA FOR USE AND CONTAINMENT DEVICES

- All OXIDIZERS work shall be done in the laboratory fume hood. When working with volatile, toxic chemicals, in limited amounts, Biological Safety Cabinets (BSC) Class II, Type A2 exhausted or Class II, Types B1and B2 BSCs exhausted to the outside can be used.
- The fume hood's sash must be in the position where a face velocity of 100 feet per minute is achieved. The BSC must be certified annually by a qualified outside vendor.
- Environmental Health and Safety certifies fume hoods annually and places a yellow sticker to indicate the date of certification and the proper sash height for achieving proper fume hood face velocity.
- Contact Engineering (716-4351) immediately if fume hood is malfunctioning.
- Cylinders of compressed gases should be secured at all times.

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SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

- Store oxidizers away from flammables, organic compounds, and combustible materials.
- Keep away from reducing agents such as zinc, alkaline metals, and organic acids.
- Store in a cool, dry place.
- Strong oxidizing agents like chromic acid should be stored in glass or some other inert container, preferably unbreakable. Corks and rubber stoppers should not be used.
- Reaction vessels containing appreciable amounts of oxidizing material should never be heated in oil baths, but rather on a heating mantle or sand bath.

Add Lab Specific Special Handling/Storage Procedures

EMPLOYEE EXPOSURE MONITORING

- Users of OXIDIZERS are required to notify EH&S at 716-9375 so air sampling/monitoring may be performed to determine exposure level.
- Individuals planning a family or pregnant can contact EH&S for exposure determination, consultation, and recommendations.
- Exposure monitoring through EH&S is free of charge.

CHEMICAL USE WITH ANIMALS

Click here to enter text. Please consider other routes of exposure when handling animal (e.g., cage sign) and animal bedding.

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WASTE DISPOSAL

- Chemicals shall not be drain disposed unless prior approval is given by EH&S.
- Excess OXIDIZERS and all waste material containing OXIDIZERS must be placed in an unbreakable secondary container labeled with the following **"HAZARDOUS WASTE OXIDIZERS"**.
- Full containers of OXIDIZERS waste must be disposed of according to the EH&S Hazardous Waste Program.
- A Waste Ticket must be completed and submitted prior to disposing of OXIDIZERS through EH&S.

EMERGENCY PROCEDURES

Emergency Numbers:

Fire and Medical Emergencies	716-9111 (9 + 911 for Friedburg campus)
Principal Investigator's Emergency Number	Click here to enter text.
Employee Health	716-4801
Hospital Emergency Room	716-9008
Environmental Health and Safety	716-9375

Laboratory Contact Information:

Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.

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FIRST AID

- The nearest safety shower station is located: Insert text here
- The nearest safety eyewash is located: Insert text here

  If chemical exposure occurs, flush exposed area for 15 to 20 minutes using emergency eyewash station and/or safety shower.

- Call 716-9111 and describe the extent of injuries, chemical spilled and the amount.
- Keep people out of the area.
- Report all accidental exposures to Employee Health Services.
- Complete an online injury/illness report if there is an over-exposure to the chemical or if there is an accident involving the chemical.

SPILL AND ACCIDENT PROCEDURES

If the chemical spilled is considered a carcinogen, reproductive toxin or highly toxic chemical, contact 716-9111 and evacuate area immediately, regardless of spill amount. If you are unsure of type of chemical, contact 716-9111. For all other spills use the chart below for spill reporting and response: Chemical Spill Procedures

SPILL QUANTITY	PROPER SPILL RESPONSE
Spill less than 300 mL	**Contact Environmental Health and Safety (716-9375) and clean up spill using spill kit.**
Spill greater than 300 mL	**Do not attempt to clean up spill. Leave the Area and immediately report to WFBMC Security (716-9111).**

CERTIFICATION OF APPLICATION
PLEASE READ
THESE ITEMS AUTOMATICALLY BECOME A PART OF YOUR SOP

1. I understand that it is my responsibility to assure that all personnel working in my laboratory with any of these hazards are fully informed about their specific dangers, proper actions for safe use, steps to take in case of accidents, and are provided with all necessary safety equipment and instructions in its use.
2. I agree to follow the provisions of the Chemical Hygiene Plan.
3. I will ensure that all of my personnel attend Basic Lab Safety Training by EH&S prior to using chemical materials.
4. I agree to permit Representatives of WFSM Environmental Health and Safety to inspect the facilities where this work is being conducted.
5. All chemical waste will be disposed of through EH&S Chemical Waste Program. I understand that **drain disposal is NOT allowed**.
6. Chemical materials will be transported in closed containers.
7. Sharps and/or breakable plastic solid waste items will be placed in approved puncture-resistant container, i.e., a sharps container.
8. As soon as possible, the Chemical Occupational Hygiene Officer will be notified in writing of any proposed changes in locations where chemical materials are stored or used.
9. Additional chemicals or changes in possession limits will be requested in writing from the Chemical Occupational Hygiene Officer.
10. Chemical materials will not be transferred to other Authorized Users without prior approval of the Chemical Occupational Hygiene Officer.
11. Chemical materials will not be shipped anywhere off campus without prior approval of the Chemical Occupational Hygiene Officer.
12. Secure chemicals (including waste) to prevent unauthorized access or removal. In addition, you must control and maintain constant surveillance of chemicals that are not in storage or are in use. This can be achieved by: 1) Locking refrigerators and/or storage cabinets, 2) Locking the laboratory when no one is present, and 3) Challenging unknown persons entering the laboratory.
13. I will notify the Chemical Occupational Hygiene Officer of my intent to leave WFUHS at least **60 days** in advance. I will be responsible for disposing of my chemical materials inventory through EH&S Chemical Waste Program.

First	Last	Signature
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