



## STANDARD OPERATING PROCEDURE

# Oxidizers

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### 1.0 PURPOSE

The purpose of this standard is to provide guidelines for the safe handling of oxidizers. Consult the MSDS for specific information about a particular oxidizer.

### 2.0 DEFINITIONS

**Oxidizer** means a chemical other than a blasting agent or explosive as defined in § 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases. In chemistry terms, it is an agent that receives electrons from a reducing agent during an oxidation-reduction reaction.

### 3.0 POTENTIAL HAZARDS

**Inorganic Peroxides** are noncombustible, but react vigorously with water to release oxygen. Reaction with organic and oxidizable substances may cause fire.

**Nitrates** are not combustible but enhance combustion of other substances. They give off irritating or toxic fumes (or gases) in a fire. Some nitrates may become shock sensitive when mixed with organic

materials.

**Organic Peroxides** are unstable, highly reactive, and extremely flammable in the dry, crystalline state. They are highly sensitive to heat, friction, impact, light, and strong oxidizing and reducing agents.

**Perchlorates** are stable under normal conditions, but may become explosive when mixed with combustible materials.

#### **4.0 EXPOSURE HAZARDS**

##### **4.1 Contact/Absorption**

Contact with skin may cause redness, irritation, and possible burns.

##### **4.2 Inhalation**

Inhalation may cause:

1. Respiratory tract irritation, sore throat, and possible burns.
2. Central nervous system effects such as nausea and headache.
3. Methemoglobinemia, which is characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), rapid heart rate and chocolate-brown colored blood.
4. Pulmonary edema.
5. Death.

##### **4.3 Ingestion**

Ingestion may cause the following:

1. Severe gastrointestinal tract irritation with nausea, vomiting and possible burns.
2. Methemoglobinemia
3. Severe and permanent damage to the digestive tract.
4. Central nervous system effects.
5. Liver and kidney damage.

#### **5.0 PERSONAL PROTECTIVE EQUIPMENT**

Use chemical splash goggles for eye protection; for operations that may involve splashing, include a face shield. Thick butyl rubber, neoprene, nitrile, or polyethylene gloves may be appropriate. Check glove manufacturer for recommendations on a suitable glove for the specific chemical.

Wear a lab coat and closed-toed shoes (non-fabric) with non-slip soles.

If a respirator is needed, then user must follow guidelines of the Respiratory Protection Program.

#### **6.0 ENGINEERING AND VENTILATION CONTROLS**

All procedures involving oxidizing materials must be conducted in a fume hood to protect against exposure.

### **7.0 SPECIAL HANDLING PROCEDURES**

1. CONDUCT PROCEDURES IN A FUME HOOD.
2. Minimize the quantity of oxidizers stored in the work area.
3. Keep oxidizers away from combustible materials; violent reactions may occur when oxidizers are mixed with or contaminated by combustible materials (e.g., wood, paper, metal powders and sulfur).
4. Exercise due care when mixing oxidizing agents and combustible materials for research. Use very small amounts to reduce exothermia and control the reaction.

### **8.0 LABELING REQUIREMENTS**

Label storage cabinets or areas with the word: **OXIDIZER**.

### **9.0 STORAGE REQUIREMENTS**

1. Minimize the amount of oxidizers used and stored.
2. Store oxidizers away from organic, flammable, dehydrating, or reducing agents.
3. Do not store oxidizers in wooden cabinets or on wooden shelves.
4. Do not return unused material to the original container.
5. Provide secondary containment for strong oxidizing acids such as perchloric and chromic acid.
6. Do not use corks or rubber stoppers.

### **10.0 FIRST AID**

See CHP 7.9.2 Chemical Exposure.

### **11.0 SPILL AND ACCIDENT PROCEDURES**

See CHP 7.9.1 Chemical Spill Clean Up.

### **12.0 WASTE DISPOSAL**

See Hazardous Waste Management and Disposal.

### **13.0 PROGRAM APPROVAL AND REVIEW**

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