

OXIDIZING CHEMICALS STANDARD OPERATING PROCEDURE

HAZARDOUS CHEMICALS/CLASS OF HAZARDOUS CHEMICALS

- Oxidizing chemicals are materials that spontaneously evolve oxygen at room temperature or with slight heating or promote combustion.
- This class of chemicals includes peroxides, chlorates, perchlorates, nitrates, and permanganates.
- Examples of strong oxidizers are listed at the end of this SOP.

HAZARD DESCRIPTION

- Strong oxidizers are capable of forming explosive mixtures when mixed with combustible, organic or easily oxidized materials

PROTECTION PROCESS

- Good laboratory technique
- Appropriate shielding through use of personal protective equipment
- Use of fume hood
- Availability of eye wash station and safety shower

PERSONAL PROTECTIVE EQUIPMENT

- Safety glasses/goggles (Wear chemical safety goggles when using small quantities or safety glasses or chemical safety goggles with face shield when using large quantities or when a splash potential exists.)
- Gloves should be worn when handling oxidizing chemicals. Disposable latex or nitrile gloves provide adequate protection against accidental hand contact with small quantities of most laboratory chemicals. Lab workers should contact OEHS for advice on chemical resistant gloves when direct or prolonged contact with hazardous chemicals is anticipated.
- Lab coats, closed toed shoes and long sleeved clothing should be worn when handling oxidizing chemicals.
- Additional protective clothing should be worn if the possibility of skin contact is likely.

ENGINEERING/VENTILATION CONTROLS

- The use of certain concentrations of perchloric acid must be performed in a fume hood equipped with wash down facilities. Contact the Office of Environmental Health and Safety for fume hood requirements.
- Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of oxidizing chemicals which pose this risk should occur in a fume hood with the sash in the lowest feasible position. Portable shields, which provide protection to all laboratory occupants are acceptable.
- A safety shower and eyewash must be available and accessible when working with acutely toxic chemicals.

SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

- Oxidizers should be stored in a cool and dry location.
- Keep oxidizers segregated from all other chemicals in the laboratory.
- Minimize the quantities of strong oxidizers stored in the laboratory.
- Never return excess chemicals to the original container. Small amounts of impurities may be introduced into the container which may cause a fire or explosion.

Spill AND ACCIDENT PROCEDURES

- Before beginning work with oxidizing chemicals, develop emergency procedures which address response actions to fires, explosions, spills, injury to staff, or the development of signs and symptoms of overexposure. The procedures should address as a minimum the following:
 - Who to contact: (University police, and Office of Environmental Health and Safety,
 - Principal investigator of the laboratory including evening phone number)
 - The location of all safety equipment (showers, spill clean up supplies, eye wash, fire extinguishers, etc.)
 - The method used to alert personnel in nearby areas of potential hazards
 - Special first aid treatment required by the type of corrosive material(s) handled in the laboratory
- Anticipate spills by having clean up equipment on hand. The appropriate clean up supplies can be determined by consulting the material safety data sheet. This should occur prior to the use of any oxidizing chemicals.
- Spill control materials for oxidizers are designed to be inert and will not react with the reagent.
- Never use paper towels or other inappropriate materials which are combustible.
- The waste materials generated during spill cleanup may pose a flammability risk and should not remain in the laboratory overnight unless it is stored in an appropriate container.
- In the event of a spill, all personnel in the area should be alerted.
- Do not attempt to handle a large spill of oxidizing chemicals. Vacate the laboratory immediately and call for assistance (Division of Environmental Health & Safety 292-1284 or 911).
- Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

WASTE DISPOSAL

- All materials contaminated with oxidizing chemicals pose a fire hazard and should be disposed of as hazardous waste.
- Alert the Office of Environmental Health and Safety if you generate wastes contaminated by oxidizers.
- Do not let contaminated wastes remain in the laboratory overnight unless proper containers are provided.

SPECIAL APPROVAL REQUIRED

- You should notify the Office of Environmental Health and Safety prior to the initial use of perchloric acid.

DECONTAMINATION

- Personnel: Wash hands and arms with soap and water immediately after handling oxidizing chemicals.
- Area: Carefully clean work area after use. Paper towels or similar materials contaminated with strong oxidizing chemicals may pose a fire risk.

DESIGNATED AREA

- No

EXAMPLES OF STRONG OXIDIZERS

Ammonium perchlorate
Ammonium permanganate
Barium peroxide
Bromine
Calcium chlorate
Calcium hypochlorite
Chlorine trifluoride
Chromium anhydride
Chromic acid
Dibenzoyl peroxide
Fluorine
Hydrogen peroxide
Magnesium peroxide
Nitrogen trioxide
Perchloric acid
Potassium bromate
Potassium chlorate
Potassium peroxide
Propyl nitrate
Sodium chlorate
Sodium chlorite
Sodium perchlorate
Sodium peroxide

Source: CRC Handbook of Laboratory Safety, 3rd edition.