**Strong Oxidizers Guidance**

The following information is intended to provide general guidance on how to safely work with a specific class of chemical or hazard. This information is generic in nature. It addresses the use and handling of substances by hazard class only.

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

Examples of strong oxidizers are listed at the end of this document.

**Securing of gas cylinders**

Not applicable

**Decontamination procedures**

**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**

Not applicable

**Emergency procedure**

Emergency procedures which address response actions to fires, explosions, spills, injury to staff, should be developed by each laboratory. The procedures should address as a minimum the following:

* **Who to contact:** (University police, Principal investigator of the laboratory including evening phone number and Office of Environmental Health and Safety,).
* The location of all safety equipment (showers, spill equipment, 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 oxidizing chemicals material(s) handled in the laboratory.

**Fume hood**

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.

**Glove (dry) box**

Not applicable

**Hazard assessment**

Hazard assessment should address proper use and handling techniques, fire safety, storage, and waste disposal issues.

**Protective apparel**

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.

The Principal Investigator/Course Director is responsible to the select the appropriate PPE

The Office of Environmental Health and Safety is available to provide guidance.

**Eye protection**

Eye protection in the form of safety glasses must be worn at all times when handling oxidizing chemicals. Ordinary (street) prescription glasses do not provide adequate protection. (Contrary to popular opinion these glasses cannot pass the rigorous test for industrial safety glasses.) Adequate safety glasses must meet the requirements of the Practice for Occupational and Educational Eye and Face Protection (ANSI/ISEA Z87.1-2010) and must be equipped with side shields. Safety glasses with side shields do not provide adequate protection from splashes; therefore, when the potential for splash hazard exists other eye protection and/or face protection must be worn.

The Principal Investigator/Course Director is responsible to the select the appropriate eye protection.

The Office of Environmental Health and Safety is available to provide guidance.

**Gloves**

Gloves should be worn when handling oxidizing chemicals. Disposable nitrile gloves provide adequate protection against accidental hand contact with small quantities of most laboratory chemicals. The Principal Investigator is responsible to the select the appropriate chemical resistant glove when direct or prolonged contact with hazardous chemicals is anticipated.

The Principal Investigator/Course Director is responsible to the select the appropriate glove.

The Office of Environmental Health and Safety is available to provide guidance.

**Safety shielding**

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.

The Principal Investigator/Course Director is responsible to the select the appropriate shielding.

The Office of Environmental Health and Safety is available to provide guidance.

**Eyewash**

Where the eyes or body of any person may be exposed to oxidizing chemicals, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Bottle type eyewash stations are not acceptable.

**Safety shower**

A safety or drench shower should be available in a nearby location where the oxidizing chemicals are used.

**Signs and labels**

**Containers:** All water reactive chemicals chemical must be clearly labeled with the correct chemical name, health hazard and CAS#. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable. Chemical containers must be dated upon receipt as well as when opened.

**Special storage**

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.

**Special ventilation**

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.

**Spill response**

Anticipate spills by having the appropriate 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. Alert personnel in the area that a spill has occurred. Do not attempt to handle a large spill of oxidizing chemicals. Vacate the laboratory immediately and call for assistance.

* University Police 856-256-4911. This is a 24 hour service.
* Office of Environmental Health Safety, 856-256-5105 or EHS@Rowan.edu.

Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

**Vacuum protection**

Evacuated glassware can implode and eject flying glass, and splattered chemicals. Vacuum work involving oxidizing chemicals must be conducted in a fume hood, glove box or isolated in an acceptable manner.

Mechanical vacuum pumps must be protected using cold traps and, where appropriate, filtered to prevent particulate release. The exhaust for the pumps must be vented into an exhaust hood.

**Waste disposal**

All materials contaminated with oxidizing chemicals pose a fire hazard and should be disposed of as hazardous waste. Do not let contaminated wastes remain in the laboratory overnight unless proper containers are provided.

Chemicals that contain hydrogen peroxide, other strong oxidizers, and/or highly reactive chemicals require special waste-disposal procedures. Questions regarding waste pick up should be directed to the Office of Environmental Health and Safety at 856-256-5105 or EHS@Rowan.edu.

**Examples of Strong Oxidizers**

|  |  |
| --- | --- |
| Ammonium perchlorateBarium peroxideCalcium chlorateChlorine trifluorideChromic acidFluorineMagnesium peroxidePerchloric acidPotassium chloratePropyl nitrateSodium chloriteSodium peroxide | Ammonium permanganateBromineCalcium hypochloriteChromium anhydrideDibenzoyl peroxideHydrogen peroxideNitrogen trioxidePotassium bromatePotassium peroxideSodium chlorateSodium perchlorate |

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