

Principal Investigator: _____

Date Approved: _____

This document covers basic chemical safety information for oxidizing gases. DO NOT USE OXIDIZING GASES UNTIL YOU HAVE OBTAINED THE NECESSARY APPROVAL.

Oxidizing Gases

Refer to the University of Arkansas Chemical Hygiene Plan for a description of chemicals that may be considered as a Particularly Hazardous Substance (PHS).

Oxidizing gases are gases that can contribute to combustion by acting as an oxygen source or those containing oxygen at higher than atmospheric concentrations (i.e., above 23-25 percent). These gases can react rapidly and violently with combustible materials or flammable vapors.

Examples of oxidizing gases include chlorine, nitrous oxide, oxygen, and compressed air.



Exposure, Signs and Symptoms and Chemical Properties

Review the appropriate sections of the chemical specific Safety Data Sheet (SDS) for information on ways to detect exposure, appropriate exposure limits, signs and symptoms of exposures and chemical properties. If data is lacking in any area, refer to the following sites for additional information:

<https://pubchem.ncbi.nlm.nih.gov/>

<https://druginfo.nlm.nih.gov/drugportal/>

<https://toxnet.nlm.nih.gov/index.html>

<http://web.doh.state.nj.us/rtkhsfs/indexfs.aspx>

Always use the smallest amount of chemical that is consistent with the requirements of the work performed. Understand the chemical properties and what are the likely routes of exposure based on those properties and the procedures to be performed. Use containment devices (e.g., fume hood, glove box) when substance can volatilize, when the substance is manipulated, whenever aerosols or particulates may be produced, or when an action may result in an uncontrolled release.

Contact Environmental Health and Safety (EHS) if there are any questions (479-575-5448).

Personal Protective Equipment (PPE) & Personnel Monitoring



Lab Coat

Flame resistant



Gloves

For proper glove selection, review the chemical safety data sheet and consult glove manufacturer recommendations with your PI or supervisor.



Eye Protection

ANSI Z87.1-compliant safety glasses or safety goggles if a splash hazard is present

Handling & Storage

Store oxidizing gases away from combustible materials, flammable gases, flammable and combustible liquids, finely-divided metals, and other easily oxidized substances such as hydrides, sulfur and sulfur compounds, silicon, and ammonia and amine compounds. Oxygen cylinders in storage should be separated from fuel-gas cylinders or combustible materials (especially oil or grease) by a minimum distance of 20 feet or by a noncombustible barrier at least five feet high and with a fire resistance rating of least one-half hour. The barrier should extend to be at least 18 inches above the tallest cylinder.

Oxidizing gas cylinders should be chained to a stable structure such as a wall. The chain should be 1/3 from the top of the cylinder. Alternatively, use a cylindrical casing to secure the cylinder to the floor next to your experimental setup.

Remove regulators from cylinders when not in use and replace with the safety cap. Never use a cylinder without a regulator. Always use the correct pressure regulator. After attaching the regulator, and before the cylinder is opened, check the adjusting screw of the regulator to see that it is released. Never permit the gas to enter the regulator suddenly. Never try to stop a leak between a cylinder and regulator by tightening the union nut, unless the cylinder valve has been closed first. Never strike an electric arc on the cylinder.

Engineering Controls, Equipment & Materials

Fume Hood

Use a fume hood (or equivalent) to keep exposure to oxidizing gases as low as possible and contain any release. If your protocol does not permit the handling of such materials in a fume hood, contact EH&S (479-575-5448) to perform an exposure assessment to determine whether alternative engineering controls or additional respiratory protection is required.

Housekeeping

Waste

Refer to the UA Chemical Hygiene Plan for details and contact EHS (479-575-5448) for specific disposal instructions.

First Aid & Emergencies

Skin or Eye Contact

Remove contaminated clothing and accessories; flush affected area for at least 15 minutes with water. If symptoms persist, get medical attention/call 911.

Inhalation

Move person into fresh air. If symptoms persist, get medical attention/call 911.

Attachments: Chemical Specific Safety Data Sheet (SDS)

Note: If there is more than one chemical that classifies as an oxidizing gas, include all appropriate SDSs with this SOP.

Authorized and Trained Personal

Name	Signature	Date