

Principal Investigator: \_\_\_\_\_

Date Approved: \_\_\_\_\_

**This document covers basic chemical safety information for acutely toxic oxidizing gases. The use of any acutely toxic oxidizing gas is subject to pre-approval by the Toxic Substance Committee. DO NOT USE ANY ACUTELY TOXIC OXIDIZING GAS UNTIL YOU HAVE OBTAINED THE NECESSARY APPROVAL.**

## Acutely Toxic Oxidizing Gases

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

Chemicals that meet the definition of a PHS acutely toxic oxidizing gas must be used only in a designated area where limited access, special procedures, knowledge, and work skills are required. A designated area can be the entire laboratory, a specific laboratory workbench, or a laboratory hood. Designated areas must be clearly marked with signs that identify the chemical hazard and include an appropriate warning; for example: WARNING! ACUTELY TOXIC OXIDIZING GAS WORK AREA

Acutely toxic gases include any gas with a median lethal concentration (LC<sub>50</sub>) of 500 ppm or less. Acutely toxic oxidizing gases can also contribute to combustion by acting as an oxygen source. These gases can react rapidly and violently with combustible materials or flammable vapors.

Examples of acutely toxic oxidizing gases include fluorine, chlorine dioxide, nitrogen oxides (NO<sub>x</sub>), and chlorine trifluoride. Note: Nitrous oxide (N<sub>2</sub>O) is not acutely toxic, and therefore is not covered by this SOP.



## 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

Chemical/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.

## Labeling & Storage

Store away from other materials that are chemically incompatible. Each container's label must include an appropriate pictogram and identify the material as a toxic and oxidizer. Acutely toxic oxidizing gases must be stored in a toxic gas cabinet or exhausted enclosure.

Keep 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.

Remove regulators from cylinders when not in use and replace with the safety cap. Never use a cylinder without a regulator. 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 materials as low as possible. 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

### Releases

Notify others in the area of the release, including your supervisor. Evacuate the location where the release occurred. Call 911 and report any exposure to EHS (479-575-5448). Remain on-site (at a safe distance) to provide detailed information to first responders.

### 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 a PHS based on acutely toxic oxidizing gases; include all appropriate SDSs with this SOP.

<b>Authorized and Trained Personal</b>		
<b>Name</b>	<b>Signature</b>	<b>Date</b>