

SOP FOR ACUTELY TOXIC GASES

Securing of gas cylinders

Cylinders of compressed gases must be handled as high energy sources. The cylinder's cap must be securely in place to protect the stem when the cylinder is in storage or when it is moved. Transport cylinder using a cylinder cart. All cylinders are to be stored and used in an upright position. Use suitable racks, straps, chains or stands to support cylinders.

Decontamination procedures

Personnel: Wash hands and arms with soap and water immediately after handling acutely toxic gases.

Equipment: Acutely toxic gases may be released when removing used tubing or regulators. These activities must be performed in a fume hood while wearing gloves to prevent exposures.

Designated area

Corridors are not to be used for the storage or use of any gas cylinder. All locations within the laboratory where acutely toxic gases are handled should be posted with caution signs. This includes all fume hoods where the acutely toxic gases are handled.

Emergency procedure

Emergency procedures address response actions to fires, explosions, spills, or injury to staff. Utilize the information available in the "Emergency 13" flip chart. The following emergency phone numbers should be utilized to initiate an emergency response:

All emergencies:	x13 (Public Safety)
Chemical Exposures:	x5-4955 (UHS)
Laboratory Safety Unit	x5-2402
Occupational Safety Unit:	x5-3241
Environmental Compliance/Hazardous Waste	x5-2056
Radiation Safety Unit:	x5-3781

Eye Protection

Eye protection in the form of safety glasses or goggles must be worn at all times when handling acutely toxic gases. Ordinary (street) prescription glasses do not provide adequate protection. (Contrary to popular opinion these glasses may not pass the rigorous tests for industrial safety glasses.) Adequate safety glasses must meet the requirements of the current version of Practice for Occupational and Educational Eye and Face Protection (ANSI Z.87.1) 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.

Eyewash

Where the eyes of any person may be exposed to acutely toxic gases, suitable facilities for quick drenching or flushing of the eyes shall be provided within 50 feet for immediate emergency use. Bottle type eyewash stations are not acceptable.

Ventilated Gas Cabinet/Fume hood

Manipulation of acutely toxic gases shall be carried out in a ventilated gas cabinet for large cylinders of acutely toxic gases. Smaller cylinders can be manipulated within a chemical fume hood.

All areas where acutely toxic gases are stored or manipulated must be labeled as a designated area.

Glove (dry) box

Certain acutely toxic gases may need to be handled in a glove box rather than a fume hood. The Laboratory Safety Unit (x5-3241) or the Principal Investigator will determine if this is required.

Gloves

Disposable gloves need to be worn when installing/removing a regulator on a gas cylinder to help keep the cylinder's threads free of oil/grease.

Gloves should be worn when handling acutely toxic gases. Many chemicals may permeate gloves in a short period of time. The selection of the proper glove material should be made according to the MSDS and the recommendations of the glove manufacturer.

Hazard assessment

Hazard assessment should focus on proper use and handling procedures, the education of employees concerning the health risk posed by acutely toxic gases, and on the demarcation of designated areas.

EHS Notification

You should notify the Laboratory Safety Unit prior to the initial use of acutely toxic gases. Notification is also required following significant changes in procedures or the quantity of materials used.

Clothing & Protective Apparel

Dermal protection from gases is normally not required. However, lab activities usually involve other activities involving liquid and dry hazardous chemicals. Therefore, personnel should wear a layer of clothing to prevent splash/droplet exposures. Personnel should wear a long sleeve shirt and pants. A lab coat can also be recommended. Personnel should wear non-skid sole shoes. The following types of shoes are not recommended: open-toes shoes, open heeled shoes, shoes made with cotton or a material that readily absorbs liquids.

Safety shielding

Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of acutely toxic gases which pose this risk should occur in a fume hood with the sash in the lowest feasible position.

Safety shower

A safety or drench shower should be available within 100 feet where acutely toxic gases are used. The path to the shower must be clear and unobstructed.

Signs and labels

Containers: All acutely toxic gases cylinders must be clearly labeled with the correct chemical name and hazard warnings. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable.

Special storage

Acutely toxic gases must be stored in a weather protected outside location, a ventilated gas cabinet, a chemical fume hood or a ventilated storage cabinet. Special ventilation of the stored cylinders is required and must be approved by the Laboratory Safety Unit.

Spill response

In the event of a release, alert personnel in the area that a gas release has occurred. Do not attempt to discontinue the flow of an acutely toxic gas. Vacate the laboratory immediately and call Public Safety (x13) to report the release. Remain on the scene, but at a safe distance, to receive and provide information to safety personnel when they arrive.

Vacuum protection

Not applicable.

Waste disposal

All empty or partially filled acutely toxic gas cylinders should be returned to the supplier. If the supplier does not accept empty or partially filled cylinders, contact the Environmental Compliance/Hazardous Waste Unit (x5-2056) concerning possible cylinder disposal.

Acutely Toxic Gases**

NAME	CAS#	NAME	CAS#
Arsenic pentafluoride	7784-36-3	Oxygen difluoride	7783-41-7
Arsine	7784-42-1	Phosgene	75-45-5
Boron trifluoride	7637-07-2	Phosphine	1498-40-4
Chlorine	7782-50-5	Phosphorous pentafluoride	7641-19-0
Diazomethane	334-88-3	Selenium hexafluoride	7783-79-1
Diborane	19287-45-7	Silicon tetrafluoride	7783-61-1
Fluorine	7681-49-4	Stibine	10025-91-9
Methyl mercaptan	74-93-1	Sulfur tetrafluoride	7783-60-0

** THIS LIST IS PROVIDED AS A GUIDE AND IS NOT ALL INCLUSIVE. CAREFULLY REVIEW SAFETY DATA SHEET BEFORE WORKING WITH CHEMICALS.