

SOP FOR ACUTELY TOXIC CHEMICALS

Securing of gas cylinders

Not applicable.

Decontamination procedures

- Personnel: Wash hands and arms with soap and water immediately after handling acutely toxic chemicals. Remove any jewelry to facilitate removal of chemicals.
- Area: Decontamination procedures vary depending on the material being handled. The toxicity of some materials can be neutralized with other reagents. All surfaces should be wiped with the appropriate cleaning agent following dispensing or handling. Waste materials generated should be treated as a hazardous waste.
- Equipment: Decontaminate vacuum pumps or other contaminated equipment (glassware) before removing them from the designated area.

Designated area

All locations within the laboratory where acutely toxic chemicals are handled should be posted with caution signs. This includes all fume hoods and bench tops where the acutely toxic chemicals are handled.

Where feasible, acutely toxic chemicals should be used over plastic-backed disposable paper work surfaces. These disposable work surfaces minimize work area contamination and simplify clean up.

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 chemicals. Ordinary (street) prescription glasses do not provide adequate protection. (Contrary to popular opinion ordinary prescription 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 chemicals, 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.

Fume hood

Manipulation of acutely toxic chemicals shall be carried out in a fume hood. If the use of a fume hood proves impractical refer to the section on special ventilation.

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

Glove (dry) box

Certain acutely toxic chemicals must be handled in a glove box rather than a fume hood. EH&S (x5-3241) or the Principal Investigator will determine if this is required.

Gloves

The appropriate glove must be worn when handling acutely toxic chemicals. Many chemicals may permeate certain gloves in a short period of time. The selection of the proper glove material should be made according to the SDS 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 chemicals, and on the demarcation of designated areas.

EHS Notification

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

Clothing & Protective Apparel

To prevent dermal exposure to these chemicals: A layer of clothing will help prevent splash and droplet exposures. Personnel should wear a long sleeve shirt and pants. A lab coat can be also 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 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.

Safety shower

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

Signs and labels

All acutely toxic chemicals 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 chemicals must be stored in a designated area.

Special ventilation

Manipulation of acutely toxic chemicals outside of a fume hood may require special ventilation controls in order to minimize exposure to the material. Fume hoods provide the best protection against exposure to acutely toxic chemicals in the laboratory and are the preferred ventilation control device. Where possible, handle acutely toxic chemicals in a fume hood. If the use of a fume hood proves impractical attempt to work in a glove box or in an isolated area on a laboratory bench top equipped with specialized exhaust ventilation.

If available, consider using a Biological Safety Cabinet (BSC). The BSC is designed to remove those acutely toxic chemicals that are in particulate form before the air is discharged into the environment. Acutely toxic chemicals that are volatile must not be used in a biological safety cabinet unless the cabinet is vented to the outdoors.

If your research does not permit the handling of acutely toxic chemicals in a fume hood, biological safety cabinet, or glove box, contact the Laboratory Safety Unit for assistance.

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

Spill response

Anticipate spills by having the appropriate clean up equipment on hand. The appropriate clean up supplies can be determined by consulting the safety data sheet. This should occur prior to the use of any acutely toxic chemical.

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 acutely toxic chemicals. Vacate the laboratory immediately and call Public Safety (x13) from a safe location for assistance. Remain on the scene, but at a safe distance, to receive and provide information to safety personnel when they arrive.

Vacuum protection

Evacuated glassware can implode and eject flying glass, and splattered chemicals. Vacuum work involving acutely toxic 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 acutely toxic chemicals should be disposed of as a hazardous waste. Wherever possible, attempt to design research in a manner that reduces the quantity of waste generated. Questions regarding waste pick up should be directed to the Environmental Compliance/Hazardous Waste Unit (x5-2056). This office can also assist you in minimizing waste generation.

ACUTELY TOXIC CHEMICALS**

Acrolein	Acrylyl chloride	2-Aminopyridine
Benzyl chloride	Bromine	Chlorine dioxide
Chlorine trifluoride	Chloropicrin	Cyanogen chloride
Cyanuric fluoride	Decaborane	Dichloroacetylene
Dimethyl disulfide	Dimethylsulfate	Dimethylsulfide
Ethylene chlorohydrins	Ethylene fluorohydrin	Hexamethylene diisocyanate
Hexamethyl phosphoramidate	Iodine	Iron pentacarbonyl
Isopropyl formate	Methacryloyl chloride	Methacryloxyethyl isocyanate
Methyl acrylonitrile	Methyl chloroformate	Methylenebisphenyl isocyanate
Methyl fluoroacetate	Methyl fluorosulfate	Methyl hydrazine
Methyltrichlorosilane	Methyl vinyl ketone	Nickel carbonyl
Nitrogen tetroxide	Nitrogen trioxide	Organo Tin compounds
Osmium tetroxide	Oxygen difluoride	Ozone
Pentaborane	Perchloromethyl mercaptan	Phosphorus oxychloride
Phosphorus trichloride	Sarin	Sulfur monochloride
Sulfur pentafluoride	Sulfuryl chloride	Tellurium hexafluoride
Tetramethyl succinonitrile	Tetranitromethane	Thionyl chloride
Toluene-2,4-diisocyanate	Trichloro (chloromethyl) silane	

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