

SAFE OPERATING PROCEDURE TOXIC GAS USE IN LABORATORIES

Definition

A toxic gas is immediately dangerous to human and animal life in small quantities. Many toxic gases are colorless, odorless, and tasteless, such as CO. Other toxic gases have characteristic tastes or odors, such as H₂S and its rotten-egg smell.

Hazards

Toxic gas storage and usage in a laboratory environment require special handling procedures. Pay attention to the MSDS for each gas. For example, CO has a National Fire Protection Association (NFPA) health hazard rating of 3, which designates a serious health hazard. Inhaling CO can cause headache, dizziness, mental dullness, weakness, bright red face, sleepiness, nausea, vomiting, unconsciousness, and eventually death.

Storage

International fire codes prohibit quantities greater than 20 ft³ of highly toxic gases to be stored or used outside of exhausted gas cabinets or certified chemical fume hoods.

Purchase toxic gases in quantities smaller than 20 ft³ or in quantities that can be easily stored and used in a gas cabinet or chemical fume hood.

Secure all gas cylinders with an approved chain, strap or floor bracket.

Some toxic gases, such as CO, are flammable. Store cylinders of flammable gases at least 20 feet from oxidizer gas cylinders (such as oxygen).

The storage location must have adequate ventilation.

Refer to Safe Operating Procedure for Compressed Gas Cylinders for additional information on cylinder safety.

Detectors/Sensors

You must continually utilize at least one toxic gas detector in laboratory spaces where toxic gas cylinders are stored and/or actively used.

Check the operation of the detectors monthly and replace the batteries every 6 months.

If the toxic gas cylinders will be operated unattended (for example, during overnight experiments) then gas detectors must be interconnected to the building emergency power source. The regulator should be linked to the building power source that would enable the regulator to stop the flow of gas in the event of a power outage if the toxic gas is run unattended.



Laboratory Door Signage

Place door signage outside of laboratories and storage rooms in which toxic gas cylinders are stored and/or used.

Include the following room entry requirements on the door sign. For example,

- CARBON MONOXIDE (CO) gas storage.
- Toxic gas.
- The principal investigator's name and contact information.
- EH&S phone number (817-272-2185) and UTA Police (817-272-3003.)

Emergency Procedures

Do not enter the laboratory upon activation of the toxic gas alarm. Wait for authorized emergency personnel.

After an alarm sounds, EH&S, emergency responders, or other personnel equipped with portable gas detection equipment must conduct air quality measurements prior to entrance into the laboratory or storage site.

Upon clearance, authorized personnel are permitted to enter the laboratory or storage room to facilitate necessary repairs to equipment or gas cylinders.

References

Compressed Gas SOP

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