



Chemical Fact Sheet

Anesthetic Gases Chemical Safety Fact Sheet

Isoflurane, Halothane, etc.



The use of anesthetic gases is a necessary part of a pain management program for the humane use of animals in biomedical research. In the past, chemicals such as chloroform and ether were used to anesthetize animals. With the development of modern anesthetics (e.g., halogenated ethers), dangerous chemicals such as ether and chloroform were replaced with more stable substitutes, such as Isoflurane. Although these anesthetics are considered to be a safer alternative, employees must work with halogenated anesthetics safely and avoid unnecessary exposure. The U.S. Occupational Safety and Health Administration (OSHA) warns that possible adverse health effects of exposure to waste anesthetic gases (WAG) include loss of consciousness, nausea, dizziness, headaches, and fatigue. Chronic, long-term exposures may result in reproductive impairment and liver and kidney disease.

Training

Only individuals who have received proper training may use anesthetic gases at the Harvard Institutes of Medicine (HIM) and New Research Building (NRB). The training shall include a review of material safety data sheets (MSDSs), signs and symptoms of exposure to WAG, and available protection methods employees can use to protect themselves. Additionally, staff must receive appropriate instruction from the supervisor or principal investigator regarding specific laboratory procedures.

NOTE: Some anesthetic gases may require registrations from the Drug Enforcement Administration and from the Massachusetts Department of Public Health. Contact the HIM/NRB Environmental Health & Safety (EH&S) Office for details.

Exposure Risks Associated with Waste Anesthetic Gases

- They are volatile emissions that can depress the nervous system.
- Chronic exposure has been associated with reproductive harm.
- Pregnant workers should consult with their institution's Occupational Health Department or their private doctor to review possible pregnancy complications associated with WAG.

Please remember the following when working with anesthetic gases:

- Provide appropriate employee chemical hygiene plan (CHP) training for all work processes.
- Anesthetic agents are volatile. Exposures can be avoided by using a WAG-scavenging device and engineering controls such as a fume hood or hard ducted biosafety cabinet.
- Do not work with these agents outside of a fume hood and/or without a properly setup scavenging device.
- Do not eat, drink, chew gum, or apply cosmetics in laboratory areas.
- Wear appropriate personal protective equipment (PPE) (laboratory coats, gloves, safety glasses.)
- Expired anesthetic agents cannot be used on animals per the Harvard Medical School (HMS) Institutional Animal Care and Use Committee.
- Call 617-432-1901 if there has been a chemical spill and report unusual odors you believe may be WAG immediately.
- Any symptoms of exposure should be reported to the institution's occupational health department.

Occupational Exposure Limits

National Institutes of Occupational Safety and Health (NIOSH) recommends that employee exposures over an 8-hour period do not exceed 2 parts per million. The HIM/NRB EH&S Office has adopted the NIOSH recommended exposure limit as an institutional limit to protect employees.

NIOSH and OSHA have produced guidance documents describing the safe handling and use of anesthetic gases, with a particular focus on employees working in the health care field. The HIM/NRB EH&S Office has specific policies and procedures for hazardous materials available for your review, and you are encouraged to review OSHA's Anesthetic Gases, "Guidelines for Workplace Exposures" website for more details: <http://www.osha.gov/dts/osta/anestheticgases/index.html>

Also See:

- The Isoflurane Standard Operating Procedure available from the HIM/NRB EH&S office.
- MSDS for the specific chemical
- HIM-NRB Chemical Hygiene Plan available on the HIM/NRB EH&S Webpage: <http://www.himnrbehs.com/himnrbehs/chemicalSafety.asp>

For more information contact the HIM/NRB EH&S Office, 617-432-2762