

12. Animal Inhalation Anesthetics

Standard operating procedures (SOP) are intended to provide you with general guidance on how to safely work with a specific class of chemical or hazard. This SOP addresses the use and handling of inhalation anesthetics for animals. If you have questions concerning the applicability of any item listed in this procedure, contact Vanderbilt Environmental Health and Safety (322-2057) or the Principal Investigator of your laboratory. Specific written procedures are the responsibility of the principal investigator.

If compliance with all the requirements of this standard operating procedure is not possible, the principal investigator must develop a written procedure that will be used in its place. This alternate procedure must provide the same level of protection as the SOP it replaces. Vanderbilt Environmental Health and Safety is available to provide guidance during the development of alternate procedures.

Training:

All Vanderbilt employees who work with hazardous chemicals must be apprised of the hazards of chemicals present in their work area. This training must be provided before initial assignment and before new exposure situations. Before a lab worker may begin work with Animal Inhalation Anesthetics they must be trained on the lab specific Standard Operating Procedure for these materials.

The primary factors that lab workers need to be trained on in regard to animal inhalation anesthetics are the harmful effects of these chemicals, the protective measures that must be taken when working with animal inhalation anesthetic and storage and handling procedures.

Securing of gas cylinders:

See Appendix O, section 10

Decontamination procedures:

Thoroughly wash hands and arms with soap and water immediately following any skin contact with anesthetic agents.

Emergency procedure:

Emergency procedures, which address response actions to fires, explosions, spills, injury to staff, or the development of signs and symptoms of overexposure, must be developed. The procedures should address as a minimum the following:

- Who to contact: University police, VEHS, and the Principal investigator of the laboratory including evening phone number.
- The location of all safety equipment (showers, eye wash, fire extinguishers, spill materials, etc.)
- The method used to alert personnel in nearby areas of potential hazards.
- Specific first aid treatment required by the type of reproductive hazards handled in the laboratory. (Student Health Clinic or Occupational Health Clinic should be consulted for first aid procedures.)

Eye protection:

Eye protection in the form of safety glasses must be worn at all times when handling anesthetic agents. Ordinary (street) prescription glasses do not provide adequate protection and cannot pass

the rigorous test for industrial safety glasses. Adequate safety glasses must meet the requirements of the Practice for Occupational and Educational Eye and Face Protection (ANSI Z.87. 1 1989) and must be equipped with side shields.

Eyewash:

Where the eyes or body of any person may be exposed to anesthetic agents, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Bottle type eyewash stations are not acceptable.

Gloves:

Single use nitrile should be worn when handling anesthetic agents. However, when larger quantities are handled or regular contact is involved more protective gloves should be used.

Hazard assessment:

Hazard assessment for work involving anesthetic agents should thoroughly address the issues of proper use and handling, fire safety (for ether), chemical toxicity, storage, and spill response.

Lab hood:**Use of small quantities:**

In most campus labs small quantities of liquid anesthetics (<100 cc) may be handled on the bench top without special ventilation. If you are located in an older building or a very small room you may not have adequate ventilation to work on the bench. Contact VEHS if you have concerns about the adequacy of the lab environment. Do not permit containers to remain open on the bench top. Ether is flammable. Be certain that there are no ignition sources present when handling ether. The odor thresholds for most liquid anesthetics (except for ether) are well above permissible exposure limits. If you smell the anesthetic the control procedures you are using are inadequate and must be re-evaluated.

Use of large quantities:

Lab hoods provide the best protection against exposure to anesthetic in the laboratory and are the preferred ventilation control device when handling greater than 100 cc outside of the original container. Always handle large quantities of ethyl ether in a lab hood due to the flammable nature of the material. If your research does not permit the handling of large quantities of ethyl ether in your lab hood, contact Vanderbilt Environmental Health and Safety to review the adequacy of all special ventilation.

Liquid anesthetics administered with a vaporizer must be scavenged. Large quantities must be handled in a hood.

Labels:

All anesthetic agents must be clearly labeled with the correct chemical name. Handwritten labels are acceptable; chemical formulas and structural formulas or abbreviations are not acceptable.

Protective apparel:

Appropriate lab attire (lab coats, closed- toe shoes and long- sleeved clothing) should be worn when handling anesthetic agents. Additional protective clothing should be worn if the possibility of skin contact is likely.

Safety shower:

A safety or drench shower should be available in a nearby location where the anesthetic agents are used.

Special storage:

Ethers, and olefins form peroxides after exposure to air and light. Since these chemicals are packaged in an air atmosphere, peroxides can form even though the containers have not been opened. Write the date received and date opened on all containers of ether. Opened containers of ether should be discarded within 6 months of opening.

Unless the manufacturer added an inhibitor, closed containers of ether should be discarded after 1 year.

Liquid anesthetic agents (i.e. halothane, enflurane, isoflurane) are not flammable but do have limited shelf life. Be certain to date the chemical when it is opened and to check expiration date before use.

Always purchase the smallest quantity required for use. Ether used for anesthetic purposes should be purchased in the smallest quantity available (typically 150 cc, Fisher Scientific E136-150) due to its short (6 month) shelf life after it is opened.

Special ventilation:

Liquid anesthetics administered with a vaporizer must be scavenged.

Spill response:

Anticipate spills by having the appropriate clean up equipment on hand. Spill materials for anesthetic agents are designed to control the liquid portion of the spill and minimize the production of flammable vapors. Never use paper towels on large spills of anesthetic agents because it exacerbates vapor production.

In the event of a spill all personnel in the area should be alerted. Turn off all sources of ignition. Do not attempt to handle a large spill of anesthetic agents. Vacate the laboratory immediately and call for assistance.

- Vanderbilt University Police Department 1-1911 or 322-2745.
Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

Waste disposal

Anesthetic agents are hazardous wastes. Questions regarding waste disposal should be directed to VEHS.