Safety Procedures for Isoflurane Use

Isoflurane is a halogenated hydrocarbon that is commonly used as an animal anesthetic. Exposure to halogenated anesthetic gases may result in toxicity to humans. Health effects from short-term exposure include: irritation of eyes, skin, respiratory tract, cough, sore throat, headache, drowsiness, and dizziness.

Volatile anesthetic waste gases should be minimized through training in anesthetic administration, using the smallest amount of anesthesia necessary, maintaining anesthetic equipment in proper working order, scavenging anesthetic waste gases, and monitoring worker exposure.

Training

Isoflurane users must complete online Isoflurane Training through UC Learning Center prior to beginning animal work involving isoflurane.

Engineering Controls (anesthetic gas capture systems)

Under no circumstances shall Isoflurane be used without the use of a scavenging/ventilation mechanism that eliminates inhalation exposure to the user. Isoflurane must be used in a well-ventilated room with no recirculation of exhaust air. Proper engineering controls include: (1) fume hoods; (2) downdraft tables; and, (3) snorkel trunks. Each means should be used in combination with charcoal canisters that collect waste anesthetic gas.

Safety Precautions for Isoflurane Use

Anesthesia Machine

- Verify equipment used (i.e., fume hood and vaporizer) are currently certified and in proper working condition.
- Ensure vaporizer is filled with specific anesthetic agent for which it is designed and certified.
- Fill vaporizer using anti-spill bottle adaptor OR fill in chemical fume hood.
• Check for leaks, defects, and damage in anesthesia equipment (including hoses and valves) and scavenging system.
• A chamber with a tight-fitting cover must be used. The cover must stay on the chamber except when the animal is being placed into or removed from the chamber.
• Purge induction chamber with oxygen for 5-10 seconds prior to opening the chamber and retrieving anesthetized animal.

**Flush the chamber with oxygen for 5-10 seconds before opening**

Canister preparation
• The weight of each new canister should be recorded before its first use and before each subsequent use.
• To function appropriately the carbon canister must be used according to the manufacturer’s recommendations.

Open-drop method
• Open-drop anesthetic procedures are not recommended, but if necessary, must be performed within a fume hood.

Personal Protective Equipment
Personnel must use the proper personal protective equipment consisting of proper selection of gloves, lab coat, and safety glasses when pouring or filling liquid anesthetic agents. When in ABSL 2 facilities, PPE use must be consistent with facility policy.

Waste Handling
Isoflurane must be disposed of as chemical hazardous waste only. Isoflurane bottles containing any residual liquid can be marked for disposal using the online WastE program.

Evaluation and Monitoring
Environment, Health and Safety is available to perform assessments of your vaporizing apparatus and personnel exposures. If you would like to request an assessment in your laboratory, please contact EH&S at 415-476-1300.

References:
Occupational Safety & Health Administration (OSHA), U.S. Department of Labor. *Waste Anesthetic Gases.*