

GUIDELINES – Use of Inhalation Anesthetics for Laboratory Animals

Version 2.1

I. Introduction

The use of inhalation anesthetics for procedures or euthanasia poses a potential risk to those associated with their use. To minimize the risk to UIC personnel, the University of Illinois at Chicago Environmental Health and Safety Standard, EHSS 2-4-6, was developed to address the use of anesthetic gases. To determine that inhalation anesthetics are being used in accordance with the following guidelines, the UIC Animal Care and Use Committee requires that Form A, Item 9c of the Protocol for Animal Use be completed by investigators.

In developing the UIC Animal Care Policy, the Animal Care Committee addressed the institution's responsibility for providing a safe working environment for persons working with laboratory animals in Section IV, C which requires that:

“Animal care and use shall be conducted with due consideration for the health and comfort of the animals and in conformance with all applicable laws and regulations, including those pertaining to occupational health and safety.”

When submitting Protocols for Animal Use, the principal investigator signs assurances that the UIC Animal Care Policy will be followed. When these protocols involve the use of anesthetic gases, this signature also includes assurances that anesthetic gases are being used in accordance with EHSS 2-4-6 and the Environmental Health and Safety Standards listed for ether. As part of its semi-annual review process, the ACC will specifically address compliance with this policy and refer laboratories that are not in compliance to the Environmental Health and Safety Office for assistance in correcting any deficiencies

II. Institutional Guidelines

General guidelines that investigators should follow when using any inhalation anesthetic are addressed in Section B of EHSS 2-4-6 and it reads as follows:

As applied to laboratory animal use:

1. No flammable gases are permitted for anesthesia or euthanasia of the larger species of laboratory animals (dog, cat, sheep, goat, swine, nonhuman primate, calf, horse, etc.) except in facilities specially designed for their use.
2. Nonflammable gases may be used in designated animal surgical stations.
3. Such stations must be provided with a gas scavenging apparatus.
4. A nonrecirculating exhaust system, such as a fume exhaust hood or other enclosure devised for the purpose, must be used whenever flammable or toxic gases are used in anesthesia or euthanasia of the smaller species (rabbit, hamster, guinea pig, rat, mouse, or other rodent, smaller mammal, bird, etc.). Concentrations of such gases or vapors far below the level causing danger of fire may be harmful to the health of personnel. Therefore, it is necessary to avoid breathing those compounds, even in small amounts.

III. Guidelines – Use of Ether

The ACC recognizes that there are a limited number of inhalation anesthetics whose physical properties allow for the safe administration through nonprecision vaporizers. Ether is such an agent; however, it can form explosive peroxides when exposed to air, light, and high temperatures, and is highly irritable to the respiratory tract of animals and people. As a result, the use of ether as an inhalation anesthetic is considered to be conditionally acceptable and requires scientific justification and laboratory personnel must follow these specific guidelines in addition to those listed above.

1. Ether must be properly labeled, (name clearly visible) and stored, not in a fume hood or on a lab bench, but in a cabinet with compatible chemicals. For chemical compatibility, see www.uic.edu/depts/envh section on Standards, Manuals, and Guidelines, Chemical Hygiene Plan Appendix A-11 (EHSS 2-3-0, EHSS 3-2-5, EHSS 4-3-0).
2. Ether should be labeled with a date when opened and disposed of or tested for peroxides yearly. Peroxide test strips are commercially available. Refer to UIC CHP Appendix A-8 for further information on peroxide-formers (EHSS 2-4-3) (EHSS 2-4-3).
3. Ether should only be used in properly functioning fume hoods, not recirculating biological safety cabinets or laminar flow hoods. Explosion proof chemical fume hoods are recommended. When handling ether and other solvents wear safety glasses, lab coat and nitrile gloves of at least 4-mil thickness (EHSS 1-1-0, EHSS 1-1-1).
4. Animal carcasses and any material exposed to ether should be allowed to sit in an approved fume hood for 15-30 minutes prior to disposal.
5. Ether exposed to air for more than 24 hours should not be used for anesthesia, because peroxides prolong induction.
6. Follow spill procedure in the UIC Chemical Hygiene Plan (www.uic.edu/depts/envh section on Standards, Manuals, and Guidelines, Chemical Hygiene Plan Section 4.3, Chemical Spills). Have readily available an appropriate spill kit. Contact the Environmental Health and Safety Office for additional recommendations.
7. Only medical grade ether should be used as an inhalation anesthetic.

References:

- *EHSS* 1-1-0 B Fume Hoods*
- *EHSS 1-1-1 B Chemical Fume Hoods*
- *EHSS 2-3-0 B Hazardous Material Storage*
- *EHSS 2-4-3 B Peroxide-forming Chemical Handling*
- *EHSS 2-4-6 B Anesthetic Gases Handling*
- *EHSS 3-2-5 B Laboratory Hazard Identification*
- *EHSS 4-3-0 B Flammable Storage*

**For copies of the Environmental Health and Safety Standards please contact the EHSO at 312-996-7233.*