



## ANESTHETIC - SAFETY FACT SHEET

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This document covers basic safety information for anesthetic gases and factors to be considered when writing a standard operating procedure (SOP). The use of any anesthetic chemical is subject to pre-approval by the Principal Investigator (PI) and/or Supervisor.

**DO NOT USE ANESTHETICS UNTIL YOU HAVE OBTAINED THE NECESSARY PRE-APPROVAL AND EQUIPMENT TRAINING. IF BEING USED IN AN IACUC PROTOCOL, SUBMIT A STANDARD OPERATING PROCEDURE FOR RESEARCH INVOLVING ANESTHETICS.**

### Anesthetic Compounds:

Anesthetics are used in the laboratory setting to induce general anesthesia in animal subjects for the purposes of surgery or euthanasia. Common anesthetics include nitrous oxide, various halogenated agents, and tricaine methanesulfonate. The most widely used halogenated agent is isoflurane (Forane®). Isoflurane is a volatile liquid at room temperature, and when vaporized, mixed with oxygen and delivered under pressure the inhalation hazard increases. Exposure to anesthetics and waste anesthetic gases (WAGs) may result in adverse neurological effects, reproductive problems in women, and developmental defects in the unborn fetus. MS-222 is used for anesthesia or euthanasia of fish, amphibians and other aquatic, cold-blooded animals. It is typically purchased as a powder and dissolved in water prior to use. Overexposure to MS-222 in humans may cause skin, eye, and respiratory irritation. There is one report in the [literature](#) of reversible retinal toxicity in a scientist with long-term exposure to MS-222 powder.

### HEALTH HAZARD WARNING:



**THE FOLLOWING CONSIDERATIONS SHOULD BE ADDRESSED IN THE ANESTHESIA SAFETY SOP UPLOADED INTO THE “ATTACHMENTS” SECTION OF THE IACUC PROTOCOL.**

## **Labeling & Storage**

Identify a location in your laboratory for the storage of anesthetic chemicals that meet these requirements: store in a well-ventilated location below 30°C (86°F), away from heat, flame, and from other materials that may be chemically incompatible. Incompatibilities include: strong oxidizing agents, strong acids, bases, and alkali metals. Keep container tightly closed and secured.

## **Engineering Exposure (inhalation) Controls, Equipment & Materials**

Exposure control devices must be utilized to prevent exposure to personnel. SOP's must identify the use of exposure control devices and mandate required training on equipment to ensure proper operation.

Use fume hoods or hard-ducted Class II B2 biosafety cabinet (BSC), especially during chemical preparations. Do not use a non-ducted BSC for exposure control from anesthetics. When fume hoods or Class II B2 BSC cannot be utilized, both active and passive scavenging systems alternatives are available but require more training and administrative controls to prevent exposure than using either type of exhausted ventilation enclosure mentioned above.

### **Active Scavenging**

When a fume hood or appropriate BSC is not available, active scavenging devices can be used. These include exhausted induction chambers, dedicated tabletop extractors, slot exhausts, downdraft tables, or snorkel trunks ducted to the building exhaust system. The PI is responsible for ensuring staff who use this equipment are trained on the proper dosing and use (supply and exhaust flow rates).




### **Passive Scavenging**

Charcoal canisters that adsorb used gas via positive pressure from equipment and the anesthetized animal's exhalation are also acceptable means of scavenging waste anesthetic gases but this requires well-fitting nose cones and short, leak-free tubing. Follow the manufacturer's instructions on monitoring canister adsorption levels/residual capacity (by date) and discard through EHS once the canister has exceeded the manufacturer's recommended limit. Ensure the manufacturer's instructions are being followed which includes methods utilized to prevent channels from forming in the charcoal –these allow gas to enter the local atmosphere. Never place the exhaust side of the canister on a flat surface -this inhibits the flow of gas. The PI is responsible for ensuring staff who use this equipment are trained on the proper dosing and use/functionality (supply and exhaust flow rates).

**PASSIVE SCAVENGING IS BEST RESERVED FOR LOCATIONS WITH INTERMITTENT, SINGLE-STATION USE. HIGHER LEVELS OF ACTIVITY SHOULD BE PROTECTED BY THE MORE EFFICIENT ACTIVE SCAVENGING.**

## Personal Protective Equipment (PPE)

Include identification of personal protective equipment to supplement engineering controls that prevent workplace exposures within the procedural steps of an SOP. Complete a [Job Hazard Analysis](#) to assist with a systematic process and written record of procedural hazard controls. The following table identifies minimum PPE required.

		
<p>Traditional lab coat; buttoned closed. Barrier coat may be appropriate if biological hazards are present.</p>	<p>Consult chemical manufacturer to determine type and thickness of gloves needed.</p>	<p>ANSI Z87.1 compliant safety glasses</p>

## Exposure Assessments

Some anesthetics have associated occupational exposure limits. Dermal absorption can be considered an exposure route. Contact EHS at [EHS-labstaff@austin.utexas.edu](mailto:EHS-labstaff@austin.utexas.edu) for assistance with worker exposure controls, including determining operation of exhaust.

## Decontamination

Wipe residual liquid with absorbent pads and clean the area with soap and water. Contact EHS (at 512-471-3511) to determine disposal of the absorbent pads. During clean up, prevent skin contact by wearing appropriate gloves.

## Waste

Because most spent, unused, and expired chemicals/materials are considered hazardous wastes, they must be properly disposed of. **Do not dispose of chemical wastes by pouring them down a sink or drain or discarding in the regular trash.** Contact EHS HMM at [EHS-HazardousMaterials@austin.utexas.edu](mailto:EHS-HazardousMaterials@austin.utexas.edu) or call 512-471-3511 for waste containers, labels, waste collection and for any questions regarding proper waste disposal. Refer to UT Austin's Chemical Waste [website](#) for more details.

## Spill Emergency Response

Notify others in the area of the spill or release, including your supervisor. Evacuate personnel and allow anesthetic to evaporate. If safe to do so, use absorbent pads to clean up liquids as described in the Decontamination section above. Call 911 from any campus phone if police or emergency medical assistance is required. Report any spill, release or exposure to EHS at 512-471-3511 during normal business hours or after hours call 911.

## First Aid & Emergencies

### Skin or Eye Contact

Remove contaminated clothing and accessories; flush affected area with water. If symptoms persist, get medical attention.

### Inhalation

Move person into fresh air. If symptoms persist, get medical attention.

### Ingestion

Rinse mouth with water. If symptoms persist, get medical attention.

### Revision Control:

<b><i>Revision Date</i></b>	<b><i>Change Made</i></b>	<b><i>Author</i></b>
12/7/2021	Original Document (** update revision date on page 1 title and footer**)	Andrea McNair (Reviewers: Suzanne Kilpatrick, Rudy Guerrero, Nena Anderson)
2/18/2022	Updates and revisions	Reviewer: Glen Otto