UCI Environmental Health & Safety

Standard Operating Procedure (SOP)

This Standard Operating Procedure (SOP) describes basic chemical safety information for inhalation anesthetics. Prior to conducting work with inhalation anesthetics personnel must obtain approval from their Principal Investigator (PI) and/or Supervisor and attend the appropriate laboratory safety training. The PI must complete the Lab-Specific Use Procedures section and provide their personnel with a copy of this SOP and a copy of the SDS from the manufacturer.

Inhalation Anesthetics

Date SOP was written:	
Date SOP was approved by PI/lab supervisor:	
Principal Investigator:	
Principal Investigator Signature:	

Type of SOP: ☐ Process ☐Hazardous Chemical [X] Hazardous Class

Purpose

The purpose of this standard operating procedure is to acquaint you with the proper and safe handling, use, storage, and disposal of inhalation anesthetics.

Properties & Hazards

General Hazards:

Inhalation anesthetics can result in adverse neurological effects, reproductive problems in women, and developmental defects in the unborn fetus. Common inhalation anesthetics include nitrous oxide, chloroform, and halogenated agents (e.g. isoflurane, desflurane, sevoflurane, halothane, andenflurane).

GHS Pictogram	UCI Hazard Level	GHS Category	GHS H-Code	Cal/OSHA Definitions
	Highly Hazardous	Specific target organ toxicity -single exposure, Central nervous system	H336	Target Organ Effects

Personal Protective Equipment (PPE)

Skin and Body Protection:

Long pants (or equivalent) completely covering legs, closed toed shoes, and a traditional lab coat or flame resistant Nomex® lab coat when working with flammables.

Hand Protection:

Nitrile or neoprene gloves are typically adequate for minor splashes. Thicker gloves should be used for longer operations, larger quantities, or direct contact. Consult the SDS, and/or the lab specific use section to determine whether the material or process requires alternative hand protection.

Eye Protection:

ANSI Z87.1-compliant safety glasses or safety goggles if a splash hazard is present.

Administrative Controls

- Never work alone with inhalation anesthetics. Inform all other personnel in the laboratory before working with these chemicals.
- Review the Safety Data Sheets (SDSs) for all chemicals used in the experiment. Online SDSs can be accessed at https://www.ehs.uci.edu/sds/index.php.
- If an individual has a concern about reproductive health in the laboratory, that individual may request an on-site assessment of their work area by UCI EHS in accordance with the UCI Reproductive Health Protection Guideline. Additional information, including how to request an assessment, can be found at the UCI EHS website (https://ehs.uci.edu/research-safety/occupational-health/reproductive-health/index.php).

Engineering Controls

Fume hood: Manipulations of inhalation anesthetics shall be carried out in containment devices (e.g. fume hoods or hard ducted biosafety cabinets) whenever possible. Use high efficiency particulate air (HEPA) filters, carbon filters, or scrubber systems with containment devices to protect vacuum lines, pumps, and the environment when possible. When a fume hood or appropriate biosafety cabinet are not available an active scavenging system or passive scavenging system may be used.

Active Scavenging: An active scavenging system uses an exhausted induction ducted to the building exhaust system (e.g. fume hood, exhaust arm, or ducted biosafety cabinet). Never use the house vacuum line for active scavenging.

Passive Scavenging: A passive scavenging system using the positive pressure from the anesthetic gas delivery system or anesthetized animal exhalation to push the waste anesthetic gas through a specially designed activated charcoal filter that absorbs the waste gas before being discharged back into the room. Charcoal filters have a finite use time, which should be monitored by weight. Weight the canisters before each use to monitor the absorption levels and prevent channels from forming in the charcoal (this would allow the gas to pass through the charcoal without being absorbed). Never place the exhaust side of the canister on a flat surface, this will inhibit gas flow, ensure that the holes at the bottom of the canister are not blocked.

Special Storage and Handling Requirements

Storage:

- Store in a well-ventilated location that is secured to prevent theft.
- Store away from heat, ignition sources (e.g. flames, sparks), and materials that are chemically incompatible (e.g. strong oxidizing agents, strong acids, bases, alkali metals).
- Keep the container tightly closed.

Handling:

- All manipulations (open chemical use) must be conducted in a fume hood or hard-ducted biosafety cabinet whenever possible.
    - Scavenging devices should be used when a fume hood or appropriate biosafety cabinet is not available.

- The exhaust from vacuum pumps must be vented into an exhaust hood. Mechanical vacuum pumps must be protected using high efficiency particulate air (HEPA) filters, carbon filters, or scrubber systems with containment devices.

Spill, Accident, and First Aid Procedures

Spills:
Refer to the spill response flowchart. Notify others in the area of the spill. Evacuate and prevent access to the location where the spill occurred. Notify your supervisor and EHS at x4-6200 immediately.

Skin or Eye Contact:
Remove contaminated clothing or contact lenses and flush the affected area with water for at least 15 minutes. Obtain medical attention immediately.

Inhalation:
Move to fresh air. Obtain medical attention immediately.

Ingestion:
Obtain medical attention immediately. (The poison control center, (800) 222-1222, is available 24 hours every day).

Waste Disposal Procedure

Disposal:
- Hazardous waste must be transferred to EHS for disposal within 6 months of being generated.
- Hazardous Waste Disposal
    - Text a pick up to hwp@uci.edu, EHS will pick up your waste within 1-3 days
    - Or visit https://ehs.uci.edu/enviro/haz-waste/

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APPENDIX A:
Lab-Specific Use Procedures

The following procedures describe how the subject chemicals are used in this laboratory beyond the practices described above.

Please see the General Information for ***Hazardous Materials Standard Operating Procedure*** for specific instructions on writing lab-specific use produces.

Add a generic process/procedure on the safe use of the chemicals within this band.

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Documentation of Training

Prior to conducting any work with inhalation anesthetics, designated personnel must provide training to their laboratory personnel specific to the hazards and procedures involved in working with these substances.

I have read and understand the content of this SOP:

Name	Signature	Date