

FACT SHEET: Isoflurane

Operational Use



Isoflurane is a volatile halogenated anesthetic agent frequently used in animal research. It is a clear, non-flammable liquid at standard room temperature and air pressure. It has an ether-like or sweet odor. Exposure to isoflurane has been associated with several health concerns and is a potent greenhouse gas when released into the environment. Research staff should review the SDS and be aware of potential health effects and take precautions to minimize exposure.

NEED TO KNOW:

1. Use Active Scavenging whenever possible (e.g., scavenging cube).
2. Use LEVs for all systems whenever possible to capture any leakage.
3. Snorkel hood can help to minimize exposure by following instructions from this Fact Sheet.
4. Contact OEHS at oehs@tulane.edu when isoflurane is used for a new process. (OEHS conducts qualitative and quantitative exposure assessments (e.g., direct-reading instrument or passive badges) to determine the exposure level and proper controls).

MORE INFO:



ISOFLURANE HAZARDS:

- Skin and eye Irritation.
- May cause headaches, drowsiness, dizziness and lightheadness.
- Adverse health effects observed in animal studies include: nerve cell damage, learning and memory impairment, abnormalities in offspring when exposed during pregnancy, and reduced sperm production/impaired sperm health.

GENERAL WORKPLACE CONTROLS:

WORK PRACTICES:

- Read SDS and label before working with isoflurane.
- Use a “key-fill” to pour anesthetic into vaporizer. (If “key-fill” is not available on vaporizer, use anti-spill adapter for a “tunnel-fill” vaporizer).
- Fill vaporizers under LEVs if pouring from a bottle into a funnel-fill vaporizer.
- Never drain vaporizer in procedure rooms to avoid an unnecessary spill.
- Weigh charcoal canister before use and record weight. Date the side of the canister. Once weight increases by 50g, discard as chemical waste.
- One drop or Bell-Jar Methods should be conducted in a ducted fume hood or similar ventilated enclosure to minimize exposure.
- Position snorkel hood as close as possible. Air intake should be < 6” from isoflurane source.
- Flush induction chamber before opening.

ENGINEERING CONTROLS:

- **Active Scavenging** (within a breathing system):
 - Excess anesthetic gases are actively removed through dedicated suction is required for active scavenging exhaust.
- **Passive Scavenging** (within a breathing system):
 - Excess anesthetic gases are passively flowing through flexible evacuation tubing and into a charcoal canister.
- **Local Exhaust Ventilations (LEVs):**
 - Snorkel hood; Portable or desktop LEVs; Ducted fume hood.
- **Other Engineering Controls:**
 - Consult manufacturer’s recommendation to utilize built-in safety features.
 - Review your protocols to identify ways to minimize exposure.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

- Gloves and eye protections should be used during open transfer.
- Respiratory protection is generally not required when using proper engineering controls. Please contact OEHS for a risk assessment if you have any concerns.

! OCCUPATIONAL EXPOSURE LIMITS:

- OSHA: No Permissible Exposure Limit (PEL)
- NIOSH: Ceiling 2 ppm over 1-hour period
- ACGIH: 50 ppm TWA



Health Hazard:
Reproductive
Toxicity



**Irritant: Skin
and Eyes**

ADDITIONAL RESOURCES:

- NIH Publication: [A case report of personal exposure to isoflurane during animal anesthesia procedures](#)
- NIOSH HHE: [Evaluation of Waste Anesthetic Gas Exposure and Miscarriages at a Veterinary Hospital](#)
- Sigma-Aldrich: [Isoflurane Safety Data Sheet](#)