**Standard Operating Procedure for Hazardous Chemicals Use**

**Chemical name: Isoflurane**

**Synonyms: none**

**CAS Number: 26675-46-7**

**Principal Investigator(s)       PI e-mail**

For chemical processes, return completed form sections 1-8 and Appendix to the Chemical Safety Committee (CSC) / US&A ([sop-approval@uwm.edu](mailto:sop-approval@uwm.edu))

If this is for IACUC Hazardous Chemical procedure, return completed sections 1-9 and Appendix to the Animal Care program ([acp@uwm.edu](mailto:acp@uwm.edu))

**Information on Chemical Purchasing Procedures are located on our website:** [**University Safety and Assurances Chemical Purchasing Procedure**](https://uwm.edu/safety-health/chemical-purchasing-process/)

1. **Submit a copy of the Safety Data Sheet(s) [SDS] with this form.**

**The SDS is stored in the room at this location:**

1. **Chemical Concentration (as purchased)** **and Health and Physical Hazards:**

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| --- | --- |
| **Concentration. As purchased** | 100% |
| **List all health and Physical Hazards** | **Found on the SDS section 2**  ACUTE EFFECTS: Anesthetic liquid and vapor.May cause central nervous system damage.Material produces anesthesia effects. Inhalation at a concentration of 0.5-3.0% can induce general anesthesia in 7 to 10 minutes, with analgesia, muscle relaxation and loss of consciousness. Symptoms include rapid respiration, diminished mental alertness, impaired muscular coordination, faulty judgement, depression of all sensations, emotional instability and fatigue. Isoflurane may cause a slight decrease in intellectual function and mood changes.In susceptible individuals, it may trigger malignant hyperthermia. |
| **Known Incompatibilities** | CONTACT WITH PEROXIDES |
| **Hazardous Decomposition Products** | Hazardous Decomposition Products- PHOSGENE, HYDROGEN CHLORIDE, HYDROGEN FLUORIDE.Under fire: Carbon oxide, hydrogen chloride gas, and hydfrogen fluoride can be fromed. |

1. **Authorized Use:**

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| Principal Investigator  Laboratory Manager  Post Doc  Employees  Graduate Students  Technical Staff  Undergraduate Student  Adult Volunteer  Other |

1. **Storage Information:**

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| **Chemical Storage Location** | Where will the chemical be used (building and room number) | **Storage**  **Requirement** |
| Area inspected regularly by |  | Refrigerator  Explosion Proof  Non-Explosion Proof  Flammable storage  Corrosive storage  Shelf  Locked cabinet  Secondary containment  Closed, & labeled container  Other Store locked up.  Keep container tightly closed in a dry and well-ventilated place.Containers which are opened must be carefully resealed and kept upright to prevent leakage.  Storage class (TRGS 510): 12: Non Combustible Liquids |

1. **Personal Protective Equipment [PPE]**

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| **Personal Protective Equipment Use** | **During Chemical Preparation** |
| Gloves  \*Check integrity of gloves before each use. | **Type** (Specify): **Nitrile** |
| Safety glasses (impact) |  |
| Safety goggles (splash) |  |
| Lab Coat |  |
| Apron |  |
| Dust Mask | Specify: N95  N100  Other |
| Respirator |  |
| Hearing Protection: |  |
| Other: (i.e. double glove, barrier cream) | Specify |
| Describe how you will employ PPE, Engineering and Administrative controls | Filling and emptying of vaporizer:  The Lapham machine needs to have one end of an “accordion” vent duct at back of fume hood facing the vent. Extend duct to the vaporizer and position opposite opening at vaporizer so as to capture vapors when dispensing. Pull out on the baffle adjustment handle (on outside of hood, right-hand side) until blue is showing on the shaft. This closes the upper baffle vents. Check that fume hood has been annually inspected and is working properly. Hold or tape a strip of tissue paper at bottom of sash to visually verify that hood is drawing air in. Induction chamber should remain in fume hood for entire procedure. For the Pearse machine, place ventilation “elephant trunk” (E-trunk) close to reservoir so as to capture vapors when dispensing. Turn on. For both machines, place a spill tray below the vaporizer to capture any spillage.  F/Air Canister Waste Anesthetic Scavenging System for Pearse Machine.Note: F/Air Canisters only absorb halogenated anesthetics (e.g., isoflurane, halothane).  1. Place the F/Air Canister on its side or in a holder so as not to occlude the vent holes on bottom.  2. Before and after each use to evaluate the remaining absorption capacity, weigh the canister and record the weight on the canister in the space provided on the canister.  3. After each use, record the amount of time the canister was used.  4. After 50-gram (total) increase or 12 hours of use, the canister MUST be replaced with a new, weighed canister. See canister for complete manufacturer’s directions.  5. E-mail Environmental Protection, hazwaste@uwm.edu for disposal of canister.  6. Check airlines to assure proper attachment.  For Lapham and Pearse, the nose cone should be placed on the rat/ mouse and properly adjusted for a good seal in the fume hood or with e-trunk nearby to capture any leakage.  The anesthetic machines are certified every three years by a vendor that checks for leaks and proper operability. Also, exposure monitoring is performed periodically during operations by University Safety & Assurances.  Open Drop Method- Chemical handling shall be performed in the fume hood over a spill tray for ease of cleanup and containment of spilled material. Air-dry used cotton pad(s) inside the anesthesia jar in hood for 15 minutes, and then discard them by wrapping in a glove and transferring to a trash.  For all- Securely close bottle of isoflurane and return to proper storage area when operations are complete. Place empty bottles in fume hood with cap off to evaporate residual. |

1. **Engineering Controls**

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| Fume Hood  Laminar Flow Hood  Biosafety Cabinet  Snorkel/ Elephant Trunk  Glove Box  Vented Gas Cabinet  Other (includes but is not limited to; pressure relief valves, intrinsically safe hot plates. Automatic shut -offs) |

1. **Chemical Spill Procedure**

**Describe the spill cleanup protocol for the maximum volume of the chemical that would be in use at any one time. Refer to the SDS or guidance from University Safety and Assurances for procedures.** [**http://uwm.edu/safety-health/emergency/**](http://uwm.edu/safety-health/emergency/)

**Check all that apply and explain below:**

|  |
| --- |
| A spill kit or cleanup materials are present in each lab.  Specify special materials required for the chemical cleanup. **Absorbant or paper towel**  Personnel are trained on spill cleanup procedure of each chemical and emergency contacts.  Proper personal protective equipment (PPE) available for spill cleanup. See #6 for PPE.  Emergency eyewash and/or safety shower located nearby (within 10 seconds) and unobstructed.  Personnel trained on eyewash/ shower location and operation  Eyewash/ shower inspected annually and activated weekly to verify operability.  Explain spill procedure: **Ventilate area. Absorb spill and seal absorbent in bag or place in fume hood to evaporate.** |

1. **Chemical Use Process**

**List each step of the procedure including the hazards associated with the step and controls that will be used to ensure safety. Be as specific as possible.**

**NOTE: Identify potential methods of human exposure to the chemicals during sample preparation. Also identify health hazard or routes(s) of entry into the body and explain how they affect the body.**

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| **Process Step** | **Hazards** | **Safety Controls** |
| *ex.) Transfer 5 ml of hydrofluoric acid to a plastic 50 ml beaker.* | *Corrosive, splash, fluoride ion*  *readily penetrates skin and bonds to calcium ions* | *Lab coat, splash goggles, face*  *shield, nitrile gloves- initial thin glove inside gauntlet glove* |
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1. **Animal Care and Use of Chemicals**

**Fill out section 9 *only* if you have an accompanying IACUC Procedure.**

1. **IACUC Procedure**

**Protocol Title:**       **Protocol Number(s):**

1. **Describe any Special Chemical and Carcass Disposal Requirement**

**Refer to the Waste Disposal Guidelines** [**http://uwm.edu/environmental-protection/disposal-guide/**](http://uwm.edu/environmental-protection/disposal-guide/) **or contact Environmental Protection (**[**hazwaste@uwm.edu**](mailto:hazwaste@uwm.edu)**) for guidance. (Check all that apply)**

|  |  |
| --- | --- |
| **Chemical Disposal** | **Hazardous Chemical** |
| **Routine scheduled hazardous waste pickup**  **No special disposal requirements** |  |
| **Neutralization** |  |
| **Sanitary Sewer** |  |
| **Other disposal: (Specify): Glass disposal, residual= evaporation** |  |
|  |  |
| **Carcass** |  |
| **Animal facility freezer and disposal service** |  |
| **Scheduled Hazardous waste pickup** |  |
| **Other disposal (Specify):** |  |
|  |  |
| **Excretion-contaminated Materials**  **(hazardous)** |  |
| **Disinfection (Specify):** |  |
| **Autoclave** |  |
| **Sanitary Sewer** |  |
| **Other Decontamination Method (Specify)** |  |

**Explain disposal methods: Place empty bottles in fume hood with cap off to evaporate residual. For quantities of Isoflurane, routine, scheduled haz waste pickup.**

1. **IACUC Training**

**List personnel and indicate the type of training the person has received related to the use of the chemical. Also specify the date the person was trained and by whom, as well as the experience that person has with the chemical or procedure.**

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| --- | --- | --- |
| **Personnel\*\*** | **Type of Training** | **Experience**  (Yrs., Type work) |
|  | **CHP and Lab Safety**. Date trained      **Conducted By**  Lab Specific CHP Date trained     **Conducted By**  **Hazardous Waste**. Date trained      **Conducted By**  **Other(Specify)** Date trained     **Conducted By** |  |
|  | **CHP and Lab Safety**. Date trained      **Conducted By**  Lab Specific CHP Date trained     **Conducted By**  **Hazardous Waste**. Date trained      **Conducted By**  **Other(Specify)** Date trained     **Conducted By** |  |
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|  | **CHP and Lab Safety**. Date trained      **Conducted By**  Lab Specific CHP Date trained     **Conducted By**  **Hazardous Waste**. Date trained      **Conducted By**  **Other(Specify)** Date trained     **Conducted By** |  |

\*\*For approved IACUC procedures notify US&A to update this information when new individuals not listed above will be working with the hazardous chemicals

1. **IACUC SOP Reviewed and Approved (initialed) by:**

|  |
| --- |
| **Animal Care Program:**  **Laboratory Safety:**  **Environmental Protection:** |

**University Safety & Assurances Web Guidance for**

**Hazardous Chemical SOPs**

**Use the following links to go to web page.**

* + Laboratory Safety <http://wwwdev.uwm.edu/safety-health/lab-safety/>
  + Biosafety <http://wwwdev.uwm.edu/safety-health/biosafety/>
  + Carcinogens <http://wwwdev.uwm.edu/safety-health/rtk-health-hazards/>
  + Eyewash/ Safety Shower <http://wwwdev.uwm.edu/safety-health/laboratory-equipment/>
  + Flammable Liquid Storage <http://wwwdev.uwm.edu/safety-health/chem-safety/>
  + Fume Hood Procedures <http://wwwdev.uwm.edu/safety-health/laboratory-equipment/#General>
  + Hazardous Communication <http://wwwdev.uwm.edu/safety-health/chemrtk/>
    - Material Safety Data Sheets (source) <http://uwm.edu/safety-health/chemrtk/>
  + On-Line Safety Training <http://uwm.edu/safety-health/laboratory-training/>

Including:

* + - Laboratory Safety
    - Bloodborne Pathogens
    - Hazard Communication
    - Hazardous Waste Orientation
    - Mercury Spill Clean-up Procedures
  + Personal Protective Equipment <http://uwm.edu/safety-health/general-ppe/>
  + Sharps Disposal <http://uwm.edu/environmental-rotection/non-hazardous-waste/#a7>

**Appendix**

**Documentation of Training**

The individuals listed below have read and fully understand this Standard Operating Procedure. The individuals have received training from their Supervisor, Group Safety Representative (GSR) or Laboratory Manager/Graduate Student and are aware of all potential hazards and countermeasures related to this Standard Operating Procedure.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Name | Signature | E-Mail | Date | Trainer Initials |
| 1 |  |  | **@uwm.edu** |  |  |
| 2 |  |  | **@uwm.edu** |  |  |
| 3 |  |  | **@uwm.edu** |  |  |
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