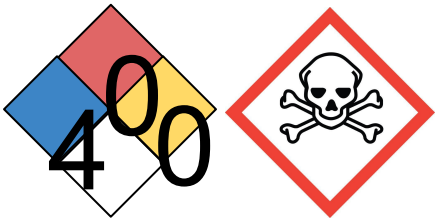
Biology and Wildlife

STANDARD OPERATING PROCEDURE

Phenylthiourea, N-Phenylthiourea



Location(s): Murie 209, 211
Chemical(s): Phenylthiourea, N-Phenylthiourea CAS # 103-85-5

Specific Hazards:

- GHS Classification in accordance with 29 CFR 1910.1200 (OSHA HCS):
  - Acute toxicity, oral (category 1), H300
  - Fatal if swallowed, H300
  - May cause an allergic skin reaction, H317
  - Skin sensitization (category 1), H317

- Danger.
  - Fatal if swallowed.
  - May cause an allergic skin reaction.
  - Avoid breathing dust/fume/gas/mist/vapors/spray.
  - Wash skin thoroughly after handling.
  - Wear protective gloves.
  - Do not eat, drink or smoke when using this product.
  - Contaminated work clothing should not be allowed out of the workplace.
  - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
  - Rinse mouth.
  - IF ON SKIN: Wash with plenty of soap and water.
  - If skin irritation or rash occurs: Get medical advice / attention.
  - Wash contaminated clothing before reuse; consult Laboratory Supervisor for directions on how to do this.
  - Store locked up.
  - Dispose of contents / container to an approved waste disposal plant. Contact Laboratory Supervisor for assistance with disposal.
  - Do not handle it until all safety precautions have been read and understood.

Contact Information:

Laboratory Supervisor:	Patrick Knavel	pdknavel@alaska.edu	474-5622
Laboratory Technician:	Rosa Villarreal	rvvillarreal@alaska.edu	474-7205

1. Purchasing:

All chemical orders are placed by the Laboratory Technician once approved by the Laboratory Supervisor.

2. Storage:
JT Baker storage code is blue; stored in a locked cabinet in 209 in a secondary container designated for health hazards.

3. Authorized personnel:

- All authorized personnel must have completed all required employee and laboratory safety training.
- The Instructor is authorized to train their TAs on the proper preparation, handling, storage and disposal of this material. The instructor may delegate training to the B&W Laboratory Supervisor by making arrangements at least two (2) weeks in advance.
- TAs, once trained, are authorized to prepare solutions and to train and supervise their students.
- Students must be trained in the use of this material in accordance with this SOP before conducting a lab. Students are only permitted to use dilute solutions of this compound; they should not handle concentrated or solid phenylthiourea.

4. Training requirements:
The user must demonstrate competency and familiarity regarding the safe handling and use of these materials prior to using them. Training shall include the following:

- Review of this SOP and chemical Safety Data Sheet

5. Use location:

- Murie B&W teaching labs, rooms 209 and 211
- On tables or lab benches isolated from sinks.
- This material shall NOT be used near a sink. In the event of a leak or spill, this material must be contained and may not enter the drain.

6. Personal protective equipment (PPE):

- All personnel are required to wear the following personal protective equipment (PPE) whenever conducting this procedure:
    - Nitrile gloves, thickness of 0.11mm has a breakthrough time of 480 minutes
    - Safety glasses or goggles, face shield if working with concentrated solutions
    - Lab coat, long sleeved
- PPE must be inspected prior to use and replaced if damaged.
- Long hair must be secured behind the head during all lab activities.
- In addition to wearing appropriate PPE, phenylthiourea solutions prepared from solid phenylthiourea must be prepared in the fume hood to provide adequate respiratory protection.
- PPE must be removed as appropriate to avoid contaminating surfaces and items in the lab or outside of the lab that should not be contaminated. In particular, PPE must be removed before leaving the lab, before handling personal items such as cell phones or laptops, and before moving on to other procedures in the lab. If a subsequent lab procedure also requires gloves, phenylthiourea-contaminated gloves must be removed and disposed of appropriately, and fresh gloves must be donned.

7. Spill equipment:
Appropriate PPE shall be worn to clean up a spill.
Materials needed:

- Inert absorbent material. Paper towels are suitable.
- Waste containers to keep contaminated material separate from trash.

In the event of a spill, follow the directions in section 12, below.

8. Procedure:

Instructors shall provide TAs and students with detailed, written lab procedures to follow. Instructors shall train TAs on each procedure before TAs instruct students in the procedure.

Materials needed:

- Phenylthiourea solid (PTU)
- water
- balance and weigh boat
- labeled container, securely sealing
- secondary containment sufficient to hold entire volume of solution to be prepared
- waste collection container, appropriately labeled, securely sealing, in secondary containment

Procedure Notes:

PPE must be used appropriately throughout the procedures. Only TAs or instructors may handle solid or concentrated phenylthiourea. Handling of solid phenylthiourea and preparation of phenylthiourea solutions shall occur in the fume hood.

Procedure Steps: Preparation of Working Solution from Solid:

1. Don appropriate PPE.
2. Place all materials in an unobstructed, properly functioning fume hood.
3. Work at least 8" inside the fume hood sash, but not along the sides or back wall of the hood as this would impede air flow.
4. Measure the required amount of RO water into the tightly-closing, labeled container.
5. Use a scoop to measure solid phenylthiourea into a weigh boat. Less than 0.5g of phenylthiourea will dissolve in 100mL of water (a 0.5% w:v solution), so use no more than that percentage when preparing solutions.
6. Add the phenylthiourea to the water in the tightly-closing, labeled container. Cap tightly and swirl gently to mix. Store in secondary containment in a secure location.

Procedure Steps: Student Work with Dilute Solution in Lab:

1. TA or instructor will measure and set out solutions for student use.
2. Prior to the lab, students must be trained on the proper use of PPE and proper handling and disposal of solutions.
3. Students must don appropriate PPE before beginning work.
4. Phenylthiourea can be measured into test tubes or cuvettes using disposable transfer pipets.
5. Waste solutions containing phenylthiourea shall be collected at student workstations and transferred to a waste container that closes securely.
6. Solutions that do NOT contain any hazardous materials should be kept separate from hazardous waste to minimize the amount of hazardous waste that must be sent for processing.
7. If catechol is also being used (phenylthiourea is most often used in B&W labs as an inhibitor of polyphenol oxidase (aka catechol oxidase)), both catechol and phenylthiourea-containing wastes must be collected for disposal as hazardous waste.

9. Waste disposal and clean up:
The authorized person(s) using this material is (are) responsible for the safe collection, preparation and proper disposal of waste unless otherwise stated below. Waste shall be disposed of as soon as possible and in accordance with all laboratory and University procedures.

Students and TAs shall dispose of used materials properly.

- Phenylthiourea containing solutions must be collected and disposed of as hazardous waste.
- Waste containers must be clearly labeled with "Phenylthiourea Waste," the approximate concentration of phenylthiourea in the waste, the class, the instructor's name, and the date waste collection began. If catechol is also present in the solution, its presence and approximate concentration in the waste must also be indicated.
- When the waste is ready for disposal, label the container "for disposal" and contact the Laboratory Supervisor.

10. Decontamination:

- No decontamination is necessary following the use of dilute phenylthiourea solutions. Normal cleaning procedures for glassware and lab surfaces should be followed after solutions have been collected as waste.

11. Exposures: Emergency procedures to be followed (from SDS):
The most important known symptoms and effects are as stated in the "Specific Hazards" statement at the beginning of this document.

General advice

Consult a physician. Show the safety data sheet to the doctor in attendance. Move out of the dangerous area.

Eye contact with phenylthiourea solutions

Flush eyes with water as a precaution.

Skin contact with phenylthiourea, solid or solutions

Wash off with soap and plenty of water. Take the victim immediately to hospital. Consult a physician.

Ingestion of phenylthiourea solutions

Never give anything by mouth to an unconscious person. Rinse mouth with water. Immediately consult a physician.

Inhalation

If breathed in, move the person into fresh air. Immediately consult a physician. If not breathing, give artificial respiration and call 911.

12. Spills:

- If a spill occurs, personal safety should come first.
- Alert everyone in the area where the spill occurred so that they can avoid contact with spilled material.
- Soak up the spilled liquid with paper towels. Place them in a separate waste container for solid wastes rather than in the container with liquid waste.
- Clean the area where the spill occurred with a standard laboratory cleaner and water.
- Do not allow any material to enter drains.
- TA or instructor who spills solid phenylthiourea: avoid dust formation. Avoid breathing vapors, mist or gas. Sweep up using paper towels. Dispose of spilled material and contaminated paper towels in a suitable, closed waste container for disposal. Waste container must be clearly labeled with contents, date produced, class and instructor name.

13. Phone numbers:

Biology and Wildlife Laboratory Supervisor	474-5622
Biology and Wildlife Laboratory Technician	474-7205
EHSRM Hazardous Materials (if B&W Lab Supervisor not available, assistance with a spill)	474-5617
EHSRM Industrial Hygiene (if Hazardous Materials not available; assistance with exposures)	474-6771
EHSRM office (if Hazardous Materials or Industrial Hygiene not available)	474-5413
University of Alaska Fairbanks Emergency Response (serious accidents, fire)	911

14. Other important information:
This material must not enter the standard solid or liquid waste streams (i.e. regular trash or sink drains). All contaminated materials must be collected and disposed of as hazardous waste.

This material is most often used as an inhibitor of polyphenol oxidase (aka catechol oxidase). Catechol is also a hazardous material, and the SOP for its use must also be followed. Phenylthiourea is a more hazardous substance than catechol. When working with both substances at once, the more restrictive specifications for phenylthiourea take precedence over the specifications for catechol.

Training Record

I, the undersigned, have read and understand the above SOP. I have been trained to carry out this procedure and will follow the above SOP. I agree to contact my Supervisor and the Biology and Wildlife Laboratory Supervisor if I want to modify this procedure and obtain permission for any modifications before implementing them.

Name	Signature	Date	Person Providing Training

Prepared by: Denise Kind **Date:** 5/22/2015
Reviewed by: Tracey Martinson **Date:** 7/24/2015