

Chemical Safety – Special Hazards

Safe Work Procedure (SWP – 008)

Stench Compounds

Last revised: March 16, 2026

REVISION HISTORY

	<i>Revision Date</i>	<i>Author</i>	<i>Position</i>
1.	18-May-2022	Paraskevi Lagaditis	OHSE consultant
2.	16-Mar-2026	Paraskevi Lagaditis	OHSE consultant

DOCUMENT APPROVAL

Approved by: Laboratory Safety Committee

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Chair, Laboratory Safety Committee

May 18, 2022
Date Approved

**This revision replaces all previous versions of this document. If a copy is printed, it is the users' responsibility to verify the copy is the most current version of the document.*

PURPOSE

To provide guidance and instruction of the safe use and handling in laboratories stench compounds. In addition to this general Safe Work Procedure (SWP), each lab must develop a lab-specific work procedure unique to the experiments and activities being performed. The Lab SWP must be reviewed by OHSE (see Procedures, #7)

SCOPE

The SWP applies towards the handling and disposal of stench compounds, in particular thiols (mercaptans) or selenides, where even a miniscule amount can create an overwhelmingly bad smell. The methods and procedures outlined could be used for other foul smelling chemicals, such as butyric acid, should typical means of handling, cleaning or disposing methods are ineffective in eliminating the smell. In the case of foul smelling pyrophorics, such as certain phosphines, please follow UVic's SWP on handling pyrophoric compounds.

TRAINING

The following training is required to be completed prior to working with PFCs:

- [WHMIS](#)
- [Lab Safety for Lab Workers](#)
- Lab SWP with documented signoff by the individual and their supervisor.

Refresher training in the General and Lab SWP must be provided when:

- there has been an extended timeframe of inactivity, or
- there has been an incident or injury, or
- 2 years has elapsed since the original training.

REGULATION AND POLICY

The University of Victoria will follow WorkSafeBC Occupational Health and Safety Regulation Part 30, and the University of Victoria Occupational Health, Safety & Environment Department.

RESPONSIBILITY

It is the responsibility of personnel undertaking activities with special hazards to complete all required training and adhere to these safe work procedures, including any additional lab or job-specific procedures.

It is the PI's or supervisor's responsibility to ensure that individuals working with special hazards have been trained prior to commencing work and have demonstrated competency in safely performing all duties associated with the special hazard in accordance with these procedures.

HAZARD

Stench compounds are those where a miniscule amount creates an overwhelmingly noxious odour. Extra steps in containing the smell need to be considered when handling or disposing.

Examples of stench compounds:

- Thiols (mercaptans)
- Sulfides
- Selenides
- Valeric acid
- Phosphines
- Isonitriles (isocyanides)
- Butyric acid

Some stench compounds in the list above are harmless (such as butyric acid) but other stench compounds have additional hazards; for example, many phosphines are pyrophoric. Always refer to the SDS of the specific compound before attempting to use and plan accordingly.

MATERIALS

- A desiccator or sealable secondary container to store stench compounds in chemical cabinets or flammable cabinets.
- Resealable (Ziploc) bags to collect all contaminated materials (e.g. gloves, weigh boats/paper etc) used to handle stench compounds.
- Wide mouth containers labeled as “stench contaminated waste” for secondary containment of resealable waste bags.
- Waste containers for solid or solution waste dedicated to stench compounds are labeled with “stench contaminated waste”.
- A container or bucket for 5-10% bleach bath to decontaminate all reusable or disposable labware contaminated or been in contact with stench compounds.
- Even though handling of stench compounds will be conducted in a fume hood, a bleach trap is recommended to minimize and prevent stench vapours in the fume hood, as show in Figure 1.

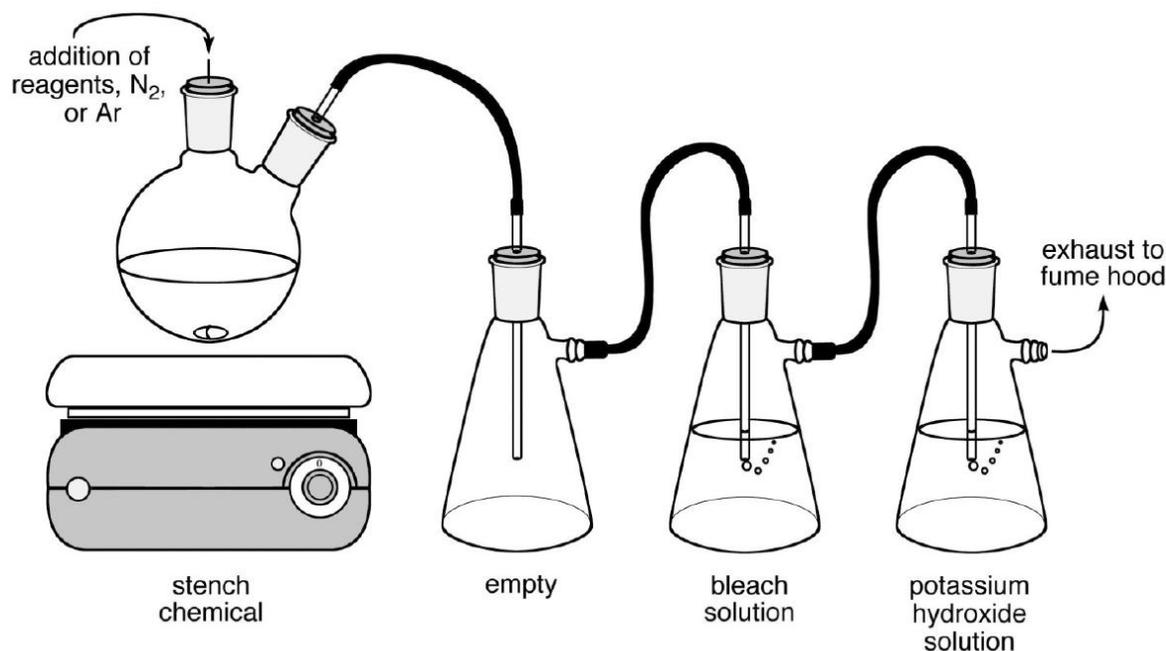


Figure 1: Bleach trap, a set up of three sequential Büchner flasks, to quench malodorous vapours from stench compounds.

PROCEDURES

1. Handling

- a. Always wear personal protective equipment (nitrile gloves, safety glasses and laboratory coat) when handling stench chemicals.
- b. All work and handling must be conducted in a fume hood with the sash lowered as much as possible.
- c. Avoid or minimize touching handles, valves, or surfaces unnecessarily once handling a stench compound bottle/container.
- d. Use the minimum amount of stench compound.
- e. Avoid pouring stench compounds or concentrated solutions of stench compounds.
 - i. Perform liquid transfers by using a syringe or cannula.
 - ii. Pipettes can be used but stench vapours will permeate into the rubber pipette bulbs and those must be decontaminated and discarded.
- f. Where possible, use air-free (Schlenk) techniques and a vacuum (Schlenk) line.
- g. If air-free methods are not accessible, use a bleach trap (Figure 1).

- i. A bleach trap is useful with thiols, sulfides, phosphines and disulfides because vapours are oxidized to less malodorous products before venting to the environment.
 - ii. Note, do not use this method if stench compound is pyrophoric (use air-free techniques).
 - iii. Use a two-neck round bottom flask for reaction mixture where inert gas (nitrogen or argon) flows into one neck and the second neck is where the vapours vent out into the trap.
 - Optional: A three-neck round bottom flask can be used instead where one neck is only for inert gas flow, one neck is for reagent addition, and one neck is for the vent trap connection.
 - iv. A series of three Büchner flasks are connected for vapours to vent.
 - v. The first Büchner flask is an empty vent to prevent back flow.
 - vi. The second Büchner flask contains a ~5% bleach solution to oxidize stench vapours.
 - vii. The third Büchner flasks contains a basic solution (sodium or potassium hydroxide) to quench hydrochloric (HCl) generated in the oxidation reaction between bleach and stench vapours
 - viii. Use gas dispersion tubes for the bleach and base Büchner flasks for the most efficient trapping.
 - ix. Cooling of traps with ice baths may be necessary for large scale reactions because the oxidation reaction between bleach and stench vapours is exothermic.
- h. When handling stench compounds in a glove box, ensure any materials that have been in contact with a stench compound are placed in a sealed container or sealable bag before taking out of the glovebox to minimize smell during transport to a fume hood for final clean up.
- i. Do not use a rotary evaporator to concentrate reaction solutions. Use vacuum with a cold trap.

2. Storage

- a. When stench compounds are provided by manufacturers in ampules, crack open the ampule in the fume hood and transfer the contents with a syringe into Schlenk flask (Schlenk bomb) for long term storage.
 - i. If stench compound is air sensitive, perform this step in a glove box. Turn off the air recirculation, transfer the contents and then purge the glove box atmosphere.
- b. Ensure caps of stench compound bottles are tightly closed.

- c. Use Teflon or Parafilm tape to seal caps of stench compound bottles.
- d. When storing in non-ventilated cabinets (such as flammable cabinets), use a secondary container to store stench compound bottles, examples include.
 - i. A wide mouth airtight container OR
 - ii. A dedicated desiccator devoted to stench compound storage.
- e. Ensure secondary containers are only opened in a well ventilated workspace (such as a fume hood) to retrieve stench compounds.

3. Spills

- a. Follow OHSE's general spill response instructions.
- b. Do not attempt to clean up any spill if not trained or comfortable. Seek assistance or call Campus Security (250-721-7599)
- c. Refer to SDS before attempting spill clean up even if trained.
- d. Specific steps for small spills of stench compounds:
 - i. Don personal protective equipment – neoprene or nitrile gloves, safety glasses, lab coat and closed toe shoes.
 - ii. Confine spill to small area with absorbent pads.
 - iii. Collect and double bag all materials.
 - iv. Clean surfaces with a solution of 3% hydrogen peroxide (H_2O_2) and sodium bicarbonate ($NaHCO_3$) to oxidize residual stench compounds.
 - Do not use bleach to oxidize spills of stench compounds to prevent hydrochloric acid by-product.
 - v. Wipe surfaces with absorbent pads.
 - vi. Wipe surfaces down with soapy water.
 - vii. Collect and double bag all materials.
 - viii. Label all bags with “stench contaminated waste” and dispose through hazardous waste.
 - ix. If waste bags still have a stench, store in a fume hood until day of waste pick up .
 - Request a 20 L Toxic Solid & Contaminated waste pail to load and seal the bags within for the pick up.

- e. Specific steps for large spills:
 - i. Secure the area and warn others
 - ii. Immediately evacuate the area
 - iii. Post “do not enter” signs on the doors of the lab
 - iv. Contact Campus Security at 250-721-7599
- f. Complete a [Department Incident & Investigation Report](#) to document and review the spill incident.

4. Decontamination

- a. Use a 5-10% bleach bath to clean all reusable (e.g. glassware) or disposable (e.g. syringe and needles) labware.
- b. Submerge and soak all labware for at least 24 hours.
- c. Clean all labware after bleach soak as per regular cleaning methods.
- d. Dispose all bleach cleaned disposable material in appropriate containers.

5. Emergencies and First Aid

- a. Call 911 to summon an ambulance if there is a medical emergency.
- b. Call Campus Security at 250-721-7599 for first aid.
- c. Refer to SDS for specific first aid response measures
 - i. In general, for eye exposure use emergency eyewash and flush for at least 15-20 minutes.
 - ii. In general, for skin contact flush affected area with running water for at least 15-20 minutes.

6. Waste Disposal

- a. Any reaction mixture or solvent from cold traps must be collected in a separate waste bottle and disposed as hazardous waste.
- b. Use a [User Supplied Container](#) to collect all solvent or liquids contaminated with stench compounds.
 - i. Avoid using the non-halogenated (red) can and halogenated (blue) can.
- c. Dispose all solid waste that has a stench in a separate container from other solid waste. Use Teflon or Parafilm tape to seal the container lid.
- d. Collect bleach bath, bleach trap solution and base trap solution into [User Supplied Containers](#) for hazardous waste disposal.

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- e. Use a secondary container or double bag any hazardous waste bottle that still releases a malodorous stench. Store in a fume hood until hazardous waste pick up day.
 - f. Affix green hazardous waste stickers on all containers that contain stench or stench quenched compounds.
 - g. Submit an online request for hazardous waste pick up.

7. Lab SWP

In addition to this general SWP, each lab that is using a stench compound requires a Lab SWP.

REFERENCES

1. WorkSafeBC *OHS Regulations Part 30* Retrieved from <https://www.worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-regulation/part-30-laboratories>
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