Lab Safety Alert
Stench chemical release

University of Victoria | Occupational Health, Safety and Environment

INCIDENT DATE: December 2, 2021
SUBJECT: Stench chemical release

BACKGROUND:

A researcher was relocating seven thiol chemicals into another laboratory because the current storage location was undergoing renovations. The bottles were wrapped with Paraffin and sealed within two plastic bags. The researcher relocated the thiol chemicals to an alternate lab and followed the Safety Data Sheets (SDS) to store them in the flammable cabinet. The flammable cabinet in the alternate lab was located underneath a fume hood. The bottles were not standing upright within the plastic bags when placed in the flammable cabinet and the researcher decided to take them out of the plastic bags. There was a minute stench odour when the bottles removed from the bag and the researcher left the lab. After around one hour, a different researcher came to work in the laboratory, detected an unknown strong odour and opted to wear a respirator to be able to work at the fume hood. A couple of hours after working at the fume hood the researcher started to experience coughing and lung irritation. A third researcher and the lab supervisor came into the lab and also noticed a strong stench odour. They located the source of the smell from the seven thiol chemicals placed earlier in the flammable cabinet but could not identify which particular bottle was causing the odour. They removed the bottles, double bagged with plastic bags and placed in a covered hazardous waste pail. OHSE was contacted to assist with disposal of the stench chemicals.

INJURIES

The researchers that inhaled the stench odour experienced coughing and lung irritation but symptoms resolved and did not require medical attention.

IMMEDIATE CAUSE

Thiol chemicals are a particular class of chemicals known as stench chemicals because even a miniscule amount of chemical can create an overwhelmingly bad smell. Some stench chemicals are benign but some can cause respiratory irritation. Even though the thiol bottle caps were wrapped with Paraffin there was most likely a minor leak from the cap when the bottles were transported or when the bottles were not upright when placed initially in the flammable cabinet. The SDS will outline best storage conditions and chemical capability; the SDS of the thiols in this case were all flammable and must be stored in a flammable cabinet. All flammable cabinets found underneath fume hoods are not vented as advised by manufacturers.

LEARNING OUTCOMES

The researcher followed the SDS and correctly placed the thiol bottles in a flammable cabinet but flammable cabinets are designed to contain fires and not odours. In addition, the release of stench odour emphasizes that simply wrapping bottle caps with Paraffin is ineffective for stench chemicals. It is recommended that stench chemicals be placed in a sealed secondary container that is capable to contain odours, such as a desiccator. Stench chemicals arebest stored in vented chemical rooms such as those found in the Bob Wright Centre, however, laboratories that do not have such rooms can avoid stench odours by simply using a proper sealable container. Another learning outcome is responding to unusual odours, the researcher that first detected the intense stench smell should not have ignored the odour and

donned a respirator. Laboratories are designed to be under negative pressure, to rapidly exchange air ventilation and not recirculate air to prevent chemical vapour buildup. Fume hoods also aid in ventilation such that they are designed to exhaust and contain noxious chemicals from worker exposure. Anytime an unknown and overpowering odour is detected in the lab and continues to persist for more than an hour may be an indicator of something wrong and needs immediate attention. When in doubt it is recommended to seek help from a supervisor or Campus Security.

RECOMMENDATIONS TO PREVENT RECURRENCE

- Store all stench chemicals in a sealed secondary container, such as a desiccator
- Follow UVic's Safe Work Procedure on Stench Chemicals
- Do not ignore unusual or unknown smells in the lab
- Seek help when there is a suspected or known chemical release
- Communicate to research groups if using their space for temporary storage of chemicals

More information handling stench chemicals:
https://www.uvic.ca/ohse/assets/docs/laboratory/swp008_stench-chemicals.pdf

More information on chemical storage:
https://www.uvic.ca/ohse/research/laboratory/chemical-storage/index.php

More information respiratory protection:
https://www.uvic.ca/ohse/health/hygiene/respirators/index.php

More information on fume hoods:
https://www.uvic.ca/ohse/research/laboratory/fumehoods/index.php