

## 7. Safety

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The safety procedures of the department are designed to protect you and the people working with you. In addition to the obvious reasons for avoiding accidents, students should be aware that they are not covered by liability insurance for their person or property.

**Prior to gaining access to the laboratories, students must have valid Queen's WHMIS training.**

Please complete a WHMIS refresher quiz if you have not done so since May 2020. Here is a link to the Queen's University Environmental Health & Safety WHMIS refresher quiz:

<http://onq.queensu.ca/d21/lp/navbars/25338/customlinks/external/18984>

The quiz should take about 45 minutes to complete.

Safe laboratory procedures are documented in the [departmental safety manual](#). All common-sense rules apply, but in particular:

- Before commencing experimental work, students **MUST acquaint themselves** with the **location of eye stations, safety showers, fire extinguishers, emergency fire exits and safety spill kits**.
- **NO ONE** is permitted to engage in experimental work unless a co-worker is present, and permission is obtained from the lab supervisor.
- **Safety glasses** must be worn at all times in the laboratories and the pilot plant.
  - A full face shield must be worn when handling corrosive chemicals such as acetic anhydride
- **Safety helmets** must be worn in areas of the Pilot Plant where overhead work might take place (east half). Safety helmets are available near the eastern end of the Pilot Plant.
- Open toe shoes or sandals are not permitted in the laboratories or the pilot plant.
- Lab coats are not required but are strongly recommended. However, if a student is wearing a short sleeved shirt, then a lab coat is required.
- Food, beverages and gum chewing are **NOT** permitted in the laboratories or the pilot plant.
- Use of headphones, earbuds and electronic communication devices (e.g. cell phones) is prohibited.
- **All accidents**, however minor, **must be reported** as soon as possible to the project supervisor or the **Department Safety Officer, Kelly Sedore (office telephone number on campus: 78384; off-campus 613-533-6000 x78384; home telephone number 613-531-8379)**. The Queen's University Emergency Telephone Number is 36111.

You are also reminded that the safety data on various chemicals are available from Safety Data Sheets (SDS). SDS are stored in binders located outside of the room in which the chemicals are contained. Most SDS are also available online at [www.aldrich.com](http://www.aldrich.com) or [www.fishersci.ca](http://www.fishersci.ca). The largest collection of SDS available on the internet may be found at: [www.msds.com](http://www.msds.com).

Students should familiarize themselves with information regarding safe use and handling of chemicals on the [Queen's University Environmental Health & Safety Page](#) by following the links under the "Chemical" menu tab located along the top of the webpage

Here is some additional information on DO's and DON'Ts with respect particularly to safe handling of chemicals in our laboratory.

- **Handling of chemicals in general:**
  - Review both the physical and chemical properties of the chemicals which you plan to use.
  - Make sure that the bottles containing chemicals are properly labeled.
  - Be aware of the spill, clean-up and first-aid procedures provided on the SDS, in case of an accident.
- **Handling of strong acids and bases** (such as HCl, H<sub>2</sub>SO<sub>4</sub>, (CH<sub>3</sub>CO)<sub>2</sub>O, NaOH)
  - Use the protective rubber bucket when carrying a glass bottle of strong acid, base or other hazardous chemicals.
  - Wear safety glasses, apron and gloves when you transfer the content from one container to another.
  - If a spill occurs, follow the recommendations provided by the appropriate SDS for the chemical that you are working with.
- **Handling of flammable organic solvents and gases:**
  - Work in the fume hood. Solvent manipulations on the bench are not permitted.
  - Keep the electrical sparks (from switches or motors) and open flame away from the flammable chemicals.
  - Follow the procedures of waste disposal as outlined in the Safety Manual.
  - Learn how to operate the fire extinguishers: water, carbon dioxide, and dry chemical types.
  - Spent solvents must be disposed responsibly in the solvent waste cans which are clearly designated for each type of solvent.
- **Handling of toxic chemicals** (such as benzene and dichloromethane)
  - Check the toxicity of the chemicals that you may come into contact with by reading the toxicity section of an SDS.
  - Wear the appropriate personnel protective equipment as recommended by the appropriate SDS.

- Avoid direct contact with bare skin and inhalation. If skin is contaminated by a toxic chemical then wash well with soap.
  - Follow the correct disposal procedures for the waste.
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