6. Safety

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 current WHMIS training.

Here is a link to the Queen's University Environmental Health & Safety WHMIS refresher quiz:

http://onq.queensu.ca/d2l/lp/navbars/25338/customlinks/external/18984

The quiz should take about 40 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 fountains, safety showers, fire extinguishers, and emergency fire exits**.
- **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.
- Prescription glasses may be worn with safety shields.
- A full face shield must be worn when handling corrosive chemicals such as acetic anhydride.
- **Safety helmets**, available on shelves near the hard-hat area in the Dupuis Hall Undergraduate Pilot Plant Lab.
- Open toe shoes or sandals are not permitted in the laboratories or the pilot plant.
- Shorts are not permitted in any laboratory. Full leg pants are recommended.
- Lab coats are not required but are recommended.
- Food and beverages are **NOT** permitted in the laboratories or the pilot plant. Chewing gum is also not permitted.
- 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 and 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 or www.fishersci.ca. The largest collection of SDSs available on the internet may be found at: www.msds.com.

Students should familiarize themselves with information regarding safe use and handling of chemicals and biohazards on the Queen's University Environmental Health & Safety Page by following the links under the "Chemical" and "Biosafety" menu tabs located along the top of the webpage

Here are 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.
  - Use appropriate safety wear as appropriate to the type of chemicals being handled. Refer to SDS for the type of safety wear required.
- **Handling of strong acids and bases** (such as HCl, H_2SO_4 , $(CH_3CO)_2O$, NaOH)
  - Use the protective rubber bucket when carrying a glass bottle of strong acid, base or other hazardous chemicals.
  - Wear safety glasses, lab coat and gloves when you transfer the content from one container to another.
  - Follow the recommendations provided on a SDS in case of a spill.
- **Handling of flammable organic solvents and gases:**
  - Work in the fume hood.
  - 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 suspect of being toxic in the appropriate 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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