Chemistry and Biochemistry Safety Guidelines

Table of Contents

1. Introduction

This manual was created by the departmental safety committee to act as a guideline within the department for a safe work environment. Everyone has a role in the internal responsibility system to ensure the safest work environment possible. Each lab should have a copy of 'Laboratory Safety; CSMLS Guidelines." Reference to these guidelines will be made throughout this manual. For further information on topics presented here, consult the University of Guelph Health and Safety Policies as well as the Occupational Health and Safety Act and its regulations.

The role of the safety committee is to promote health and safety and to act as a liaison between workers, supervisors and administration of the department as well as the Environmental Health and Safety department of the University.

2. Emergency Procedures

2.1 Emergency Call Number

The number to call in case of emergency is **2000**. Make sure that you can describe your exact location. The dispatch will then ask what type of emergency has occurred and will call in the appropriate support.

2.2 Suspicious Odors

In the case of suspicious odors, call **2000** immediately and describe the odor and location to the dispatch. If the odor that you detect is natural gas or smoke, then describe it as such. For odors other than natural gas or smoke, describe the odor as suspicious. A suspicious odor is an odor that is not commonly detected in the work area.

2.3 First Aid

There are some members of the department who are trained in first aid. A list of these trained first aiders should be posted in every lab. Each lab should also have a fully stocked first aid kit. If the situation is too severe for the first aider in the department or first aid is not available, phone **2000.**

2.4 Reporting Injuries

All injuries occurring within the department must be reported. A University of Guelph Accident Report Form must be filled out for all injuries regardless of their severity. An accident report form should be filled out by someone who witnesses the accident and not the injured person. The report is then given to the Administrative Assistant who will pass a copy along to the safety committee.

In the event of an injury requiring medical attention, call **2000** immediately. You should also notify Environmental Health and Safety by calling **3282** after calling 2000. If the injury is a "critical injury", Environmental Health and Safety will notify the Ministry of Labour. An injury is classified as a critical injury if the injury is of serious nature that:

a) places life in danger;
b) produces unconsciousness;
c) results in substantial loss of blood;
d) involves the fracture of a leg or arm but not a finger or toe;
e) involves the amputation of a leg, arm, hand or foot but not a finger or toe;
f) consists of burns to a major portion of the body; or
g) causes the loss of sight in an eye.

See University of Guelph Safety Policies 851.03.02 and 851.04.02

2.5. Evacuation Plans

There should be an evacuation plan posted in each lab. This plan should show the location of the exits out of the building.

2.6 Fire Alarm

You must leave the building immediately if you hear the fire alarm. Turn off hot plates and flames and close the door as you are leaving. There should be a designated meeting place outside of the building to ensure that everyone is accounted for. You cannot reenter the building without the permission of fire personnel.
See University of Guelph Safety Policy 851.02.05

2.7 Fire Extinguisher Use and Replacement

There should be a fire extinguisher in each lab. Lab personnel should be able to properly use the fire extinguisher if necessary. The Campus Fire Division monitor the extinguishers on a regular basis. If an extinguisher is used or compromised in some way, the Fire Division must be notified by calling 2071.
See University of Guelph Safety Policy 851.02.03

2.8 Working Alone

Working alone after hours when the work has a high potential hazard is strictly prohibited. If this type of work must be completed after hours, then a buddy system must be implemented. The buddy system involves having someone close by that is aware of where you are. You must check in with that person on a regular until the work is completed.
See University of Guelph Safety Policy 851.06.06

2.9 Building Maintenance

Call 53854 for any maintenance or housekeeping issues.

3. Training

3.1 WHMIS and MSDS

The University requires and offers WHMIS training to all new employees. Regular reviews of WHMIS training are the responsibility of the supervisor.
MSDS sheets should be kept in each lab. Links to MSDS are available through the Environmental Health and Safety web site.
See University of Guelph Safety Policy 851.08.01

3.2 Lab Specific Training

Training in general lab practices as well as training for specific practices within a lab must be documented and signed by the worker and the supervisor. A copy of the documentation must be kept in the lab as well as in another secure location away from the lab.

3.3 Autoclave, High-Speed Centrifuge and Ultracentrifuge

Standard operating procedures for use of the above equipment are found on the departmental web site. Users must be trained and the training documented by qualified personnel before using any of this equipment.

3.4 Liquid Nitrogen Handling

Liquid nitrogen users must be trained in the proper handling and transfer of liquid nitrogen.
See pages 41-42, Section 6.2 of the Laboratory Safety Guidelines and the departmental web site for a standard operating procedure.
See University of Guelph Safety Policy 851.08.05

3.5 Machine Shop safety

Personnel wishing to use the machine shop facilities must first receive orientation and training from the supervisor of the machine shop.

3.6 Radiation Safety

Before any worker can use radioisotopes, the worker must receive training through Environmental Health and Safety. Call 3282 to arrange an appointment.
See University of Guelph Safety Policy 851.09.011

4 Chemicals

4.1 Toxic Chemicals and Carcinogens

See pages 28 – 30, Section 5.2 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.08.08

4.2 Biohazards

See pages 8-13, Section 4 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policies 851.11.01 and 851.11.02

4.3 Radioactives

See pages 42-45, Section 6.4 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.09.01

4.4 Designated Substances

The following substances are considered Designated Substances and have specific regulations in the Occupational Health and Safety Act:

Acrylonitrile	Reg. 835
Arsenic	Reg. 836
Asbestos	Reg. 837,838
Benzene	Reg. 839
Coke Oven Emissions	Reg. 840
Ethylene Oxide	Reg. 841
Isocyanates	Reg. 842
Lead	Reg. 843
Mercury	Reg. 844
Silica	Reg. 845
Vinyl Chloride	Reg. 846

See University of Guelph Safety Policy 851.08.11

4.5 Flammable/Combustible

See pages 31-34, Section 5.3 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.08.06

4.6 Corrosives

See pages 35-36, Section 5.5 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.08.03

4.7 Oxidizers

See pages 34-35, Section 5.4 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.08.04

4.8 Compressed Gases and Cryogenics

See page 41, Section 6.1 of the Laboratory Safety Guidelines for compressed gases.
See pages 41-42, Section 6.2 of the Laboratory Safety Guidelines for cryogenics.
See University of Guelph Safety Policy 851.08.05

4.9 Reactives, Air and Water

See page 36, Section 5.6 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.08.07

4.10 Spills

See pages 39-40, Section 5.9 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.08.01

4.11 Waste

See pages 71-74, Section 13 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policies 851.08.14 and 851.08.15

Environmental Health and Safety will arrange for the pick-up and disposal of waste and/or surplus chemicals. In order for this to happen, you must obtain waste disposal forms and tags from the stockroom. These forms and tags must be filled out, the tags attached to the waste container and the form sent to Environmental Health and Safety (by fax or mail). Pick up is on Friday so forms must be received no later than Thursday. Disposal of hazardous chemicals is subsidized by the University when quantities re within expected weekly amounts.

4.12 Special Notes regarding Mercaptans and Noxious Odors

Users of mercaptans or other chemicals emitting noxious odors should notify all members of the departmental safety committee as well as the campus Security Services when performing experiments. They can be contacted by dialing 52245. A good contact regarding this type of notice/experiment is Dr. Adrian Schwan at ext. 58781 schwan@chembio.uoguelph.ca.

4.13 Gloves

See pages 56-59, Section 9.3 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.05.04

Gloves are worn for the protection of the worker. To protect others from contamination, **it is imperative that workers remove their gloves when finished with their application, especially if the worker leaves the lab**.

4.14 Hazchem Web (Hazardous Materials Inventory)

Environmental Health and Safety provides a web-based chemical inventory system for the entire University. Each lab should have their chemical inventory on this system and should update it regularly particularly for flammables, combustibles and/or compressed gases. Researchers can use this inventory system to find the location of desired chemicals on campus. The address for this web site is:
www.admsys.uoguelph.ca/webchem/hazchem.osp

5 Energy Hazards

5.1 High Voltage

Working alone is prohibited when working with exposed voltages of 300 volts or more. See OHSA Reg. 851, Sec 42.1 (3)

5.2 Lasers

See pages 45-46, Section 6.6 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.09.05

5.3 X-Rays

See pages 42-45, Section 6.4 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.09.02

5.4 Electrophoresis

See page 68, Section 11.9 of the Laboratory Safety Guidelines.

6 Environmental

6.1 Fume hoods

See pages 54-55, Section 9.1 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policies 851.06.10 and 851.07.05
Environmental Health and Safety offer training courses on the proper use of fume hoods.

6.2 Biological Safety Cabinets (Laminar Flow hoods)

See pages 16-18, Section 4.6 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.07.05

6.3 Building Ventilation

See page 54, Section 9.1 of the Laboratory Safety Guidelines.

6.4 Indoor Air Quality

See pages 62-65, Sections 10.1-10.4 of the Laboratory Safety Guidelines.

6.5 Temperature

See OHSA, Regulation 67/93, Section 21.

6.6 Noise

See page 47, Section 6.8 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.10.01

6.7 Lighting

See OHSA Health Care Regulation 67/93, Sections 22-27

6.8 Hallway Congestion

At the time of class changes the congestion in hallways and stairwells is considerable. Try to avoid these times when transporting hazardous materials.
Discourage students from leaving teaching labs and sitting in hallways. This presents a tripping hazard for anyone using the hallways.

6.9 Gloves

See pages 56-59, Section 9.3 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.05.04
Gloves are worn for the protection of the worker. To protect others from contamination, **it is imperative that workers remove their gloves when finished with their application, especially if the worker leaves the lab**.

7 Physical

7.1 Vacuum Systems

See page 47, Section 6.9 of the Laboratory Safety Guidelines.

7.2 Eye Wash Stations and Safety Showers

See page 56, Section 9.2 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.03.04

7.3 High Speed Centrifuges and Ultracentrifuges

See page 66, Section 11.1 of the Laboratory Safety Guidelines and standard operating procedures found on the departmental web site.
Environmental Health and Safety offers courses from Beckman.

7.4 Autoclave

See page 12-13, Section 4.4 of the Laboratory Safety Guidelines, University of Guelph Safety Policy, Section 851.07.09 and standard operating procedures found on the departmental web site.
Environmental Health and Safety offers courses from Amsco.

7.5 Doors

Laboratory doors must be kept closed unless permission has been granted by the safety committee to leave the doors open.

7.6 Bunsen Burners and Other Open Flames (Torches)

Open flames (burners and torches) cannot be left unattended. If the user must leave the room, the flame must be extinguished.
When multiples burners are used simultaneously in one room, the lighting of the burners should be staggered to minimize the amount of gas in the room.
Burners and hoses should be inspected before igniting the flame to ensure that there are no gas leaks.

7.7 Gas Cylinders

See page 41, Section 6.1 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policy 851.08.05

7.8 Liquid Nitrogen Filling Procedure

See pages 41-42, Section 6.2 of the Laboratory Safety Guidelines and the departmental web site for a standard operating procedure.

8 Ergonomics

8.1 Computer Workstations

See pages 49-50, Section 7.4 of the Laboratory Safety Guidelines.

8.2 Telephones

People using telephones for extended periods of time should use a hands-free unit (e.g. head-set).

9 Occupational

9.1 Footwear

Minimum footwear requirement for people working in labs is non-canvas, closed-toed footwear. Other work areas may require safety shoes.

9.2 Personal Protective Equipment

See pages 56-60, Section 9.3 of the Laboratory Safety Guidelines.
See University of Guelph Safety Policies 851.05.01 and 851.05.06

10 Inspections

10.1 Forms

There are inspection forms used by the safety committee for performing routine laboratory inspections, teaching lab inspections as well as inspection of the glass blowing shop. Sample forms are included so that you can perform your own inspection.

10.2 Safety Committee Inspections

One of the roles of the joint health and safety committee is to inspect the workplace on a regular basis at least once per year. Recommendations may be made to improve lab safety. A re-inspection may occur if the conditions of the lab require significant improvements.