

# Safety Manual

Brock University

Department of Chemistry

## Contents

<b>SAFETY MANUAL.....</b>	<b>1</b>
PREAMBLE .....	1
LEVELS OF RESPONSIBILITY.....	1
SAFETY EQUIPMENT AND LABORATORY CONDUCT .....	2
<i>Safety Equipment:</i> .....	2
<i>Storage of Chemicals:</i> .....	3
<i>Laboratory Conduct:</i> .....	3
GAS CYLINDERS .....	4

# Safety Manual

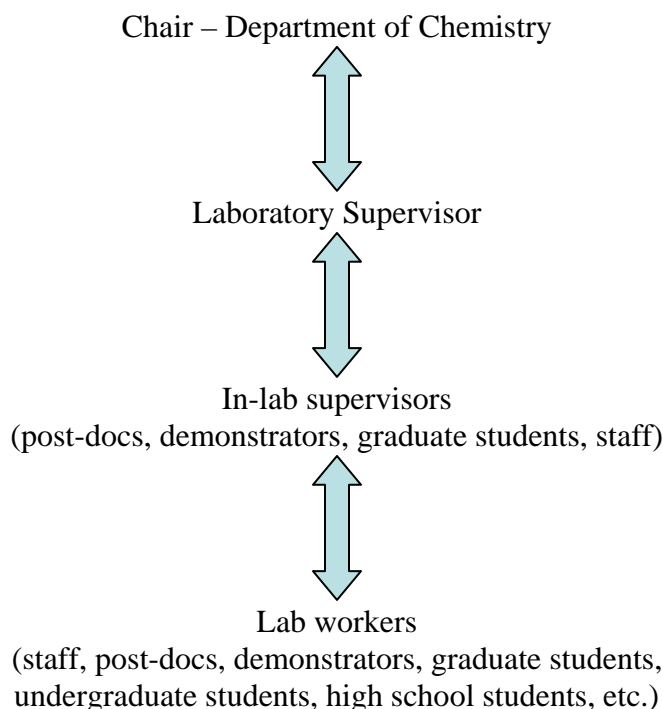
## *Preamble*

Almost all laboratory accidents are preventable. The purpose of this document is to ensure that all those working in and around the laboratory facilities are aware of their responsibilities in order to ensure a safe working environment for everyone within the Department. This safety manual applies to all members of the Department of Chemistry at Brock University, including faculty, staff, research associates, post-doctoral fellows, and students, with respect to the laboratory facilities. If there is any discrepancy between this manual and the Ontario [Occupational Health and Safety Act](#), the provincial Act will prevail. If you have any questions or comments regarding the information contained within this manual, please direct them to the Department's representatives on the safety committee:

Dr. Paul Zelisko  
Ext. 4389  
MC E200  
[pzelisko@brocku.ca](mailto:pzelisko@brocku.ca)

Dr. Costa Metallinos  
ext. 3848  
MC E217  
[metallic@brocu.ca](mailto:metallic@brocu.ca)

## *Levels of Responsibility*



First and foremost, everyone in the Department of Chemistry possesses a measure of responsibility to ensure that a safe working environment exists in all of the Department's teaching and research facilities. All individuals in the Department must be aware of their

rights and responsibilities under the Ontario [Occupational Health and Safety Act](#). It is the responsibility of the all those in a position of authority to inform the people working under their supervision of any potential hazards that they may face in the laboratory setting. This includes faculty responsible for research groups and undergraduate teaching laboratories, post-doctoral fellows and graduate students in a lab with junior members, and demonstrators in teaching labs. However, note that the arrows in the above figure point in two directions. As important as it is for supervisors to inform the people in their realm of responsibility of any and all safety issues associated with a particular lab, it is equally the responsibility of those being supervised to seek out this information. Ignorance is not an excuse when it comes to the prevention of laboratory accidents.

### ***Safety Equipment and Laboratory Conduct***

Any and all conduct by an individual entering into a research or teaching laboratory shall be in accordance with this Manual and the [Occupational Health and Safety Act](#). It is the responsibility of a laboratory's occupants, be they faculty, staff, or students, to ensure that anyone entering said laboratory behaves in accordance with the guidelines put forth in the abovementioned documents.

For the purposes of the Department of Chemistry, the following guidelines will be adhered to in the laboratories, be they designated as research or teaching facilities.

#### **Safety Equipment:**

For their own personal safety, each occupant in a lab should have:

1. **Appropriate clothing** - Lab coats must be worn. Sandals or any type of open shoes are not permitted in the lab. Loose or long hair should be tied back. Shorts and skirts should not be worn.
2. **Eye protection** - Safety goggles or glasses approved by the Chemistry Department must be worn by all individuals in the chemistry laboratories at all times.

In each lab room an emergency station should be established by the entrance to the lab. At these stations you will find everything needed in case of an accident, injury or chemical spill:

1. **Showers** - These are for use when corrosive liquids have spilled over large areas of clothes and skin.
2. **Eye-wash Fountains** - Should be used in the event that a chemical has been splashed into the eyes. Eyes should be washed for at least 15 minutes with eyeballs rolled to ensure thorough washing. The eyewash stations should be run every week for approximately 5 minutes to ensure that they are free of any sediment.

3. **First Aid Kits** - These kits contain typical first aid materials, along with solutions for chemical burns. However, chemical burns do not often become serious if the affected part is promptly washed with water. Water -- lots of it -- is the first treatment for all accidents in which corrosive chemicals have been spilled or splashed on the skin. These should be checked on a regular basis to ensure that they are fully stocked at all times.
4. **Spill Kits** - Should be used when needed. These are for solvent, acid, or base spills. Make sure that you use the appropriate substance for the given spill!
5. **Fire Extinguishers** - They are very effective for fires involving organic liquids and electrical wiring (BC class). Small fires in beakers, flasks, etc. can usually be smothered with a heat resistant mat.
6. **Fire Blankets** – These blankets are located in metal cylinders next to each lab door. They are pleated to accommodate easily wrapping an individual whose clothing is on fire. Wrap the individual in the blanket and then have them drop to the floor (avoiding any hazards) and roll.

Outside the lab rooms, in the hallways, there are the **Fire Pull Stations**. They are to be used when a serious fire starts. When the fire alarm is ringing, everyone must vacate the building.

### **Storage of Chemicals:**

All chemicals being used in the teaching and research areas must be clearly marked and stored in appropriate containers. Chemicals should be stored in such a manner as to minimize risk to the user and to the other occupants of the lab. It is the responsibility of any and all lab occupants to know and understand the proper handling and storage protocols associated with a given chemical. Refer to the chemical's Material Safety Data Sheet (MSDS) if there are any questions.

### **Laboratory Conduct:**

1. Do not eat or drink in the laboratory! The office areas between labs are considered to be chemical free areas and should be kept as such. Food and drinks may be stored in these rooms.
2. All bottles containing chemicals are labeled, this includes reactions that are in the process of being completed.
3. Do not heat volatile, flammable liquids, such as alcohols, ether, or benzene, over an open flame. Be careful to always keep all bottles and flasks containing flammable and volatile liquids well stoppered and away from open flames.
4. Bottles should be labeled for the following categories of chemicals (where appropriate) for the purposes of disposing of chemical waste: **ORGANIC** (red

label), **HALOGENATED ORGANIC** (green label), **SOLID ORGANIC WASTE** (white label), **INORGANIC LIQUID WASTE – BASES** (blue label), and **INORGANIC LIQUID WASTE – ACIDS** (yellow label). It is *extremely* important that all waste goes into the proper container. Injuries have resulted in the past from the careless mixing of chemical waste. **UNDER NO CIRCUMSTANCES ARE CHEMICALS TO BE DISPOSED OF DOWN THE SINK.**

5. All chemicals are potentially harmful and should be treated with due care. Material Safety Data Sheets (MSDS) for all of the chemicals in the lab should be readily accessible in the laboratory. Refer to these sheets if you have concerns about toxicity or other characteristics of a chemical.
6. Keep the laboratories clean! This proactive approach can help reduce injuries and accidents.
7. "Horseplay" and stunt experiments are *strictly forbidden* in all laboratories.
8. *Always* wash your hands before leaving the lab room. **Do not wear gloves outside of the lab.** Gloves are used to keep chemicals/biological samples off of your hands. By this very definition they become covered in said material. When you wear gloves outside of the lab you transfer these compounds to other surfaces where unprotected individuals may come into contact with them.

In the event of an accident or injury in the laboratory, the incident must be immediately reported to the faculty or staff member responsible for that area. In these cases an incident report must be completed (refer to the end of the Manual) and submitted in triplicate to the Department's Administrative Assistant within two (2) business days of the incident. Failure to do so can result in serious legal ramifications for the Department and its members.

## **Gas Cylinders**

Although gas cylinders are not being used in every lab within the Department, it is vital that all Chemistry faculty, staff, and students be aware of the proper handling and storage protocols for these items.

1. Ensure that you are using the correct cylinder (i.e., the cylinder contains the gas that you need). Go by the label on the cylinder and not any colour codes or labels on the valve.
2. Use the right regulator for the right gas. Know how to use the regulators properly.
3. Plan in *advance* what you will do if the valve on the gas cylinder sticks and can't be turned off. The valves have been known to stick in the open position.
4. Store the cylinders in ventilated areas away from sparks and heat sources.
5. Never heat a gas cylinder.
6. Securely fasten the cylinder to a wall or table when it is not being transported.

7. Transport gas cylinders on a wheeled cart that allows the cylinder to be securely fastened to the cart.
8. Do not transport uncapped cylinders.
9. Do not drag or pick up gas cylinders by the valve.
10. Do not tamper with the main cylinder valve.
11. When a cylinder is empty, mark "MT" on the cylinder using a piece of chalk.

***Final Note:***

Accidents will inevitably occur within a chemistry department, but it is the goal of this document to help establish a mindset that will help minimize such instances. It is our hope that through your cooperation we will be an active research and teaching environment that is safe and enjoyable for all to work in.