Practical Work N°1

Laboratory Safety Rules and equipment

1- Introduction:

Working in a chemical laboratory requires the application of a number of safety rules; these are essential for the organization of work in a laboratory. When you come back to the TP room for the first time, the student will need to know what to do, how to dress for a TP session, know the essential rules for handling materials and chemicals and the commonly used glassware and know how to write a report.

2- Objectif:

Assess the student's knowledge of the equipment used in the chemistry experiments and the safety rules to be respected in the laboratory.

3- Laboratory Safety:

Every university must have a set of laboratory safety rules. These rules should be sufficiently comprehensive to cover all eventualities yet be simple and concise. The rules must be displayed clearly in a prominent place in the laboratory. Safety training must play a major part in ensuring freedom from accidents and should aim to explain the basis for the rules. Everyone in a laboratory should be made aware that he/she is responsible for both his/her own safety and the safety of those working alongside them. It must be stressed that at all times the most important consideration is human safety.

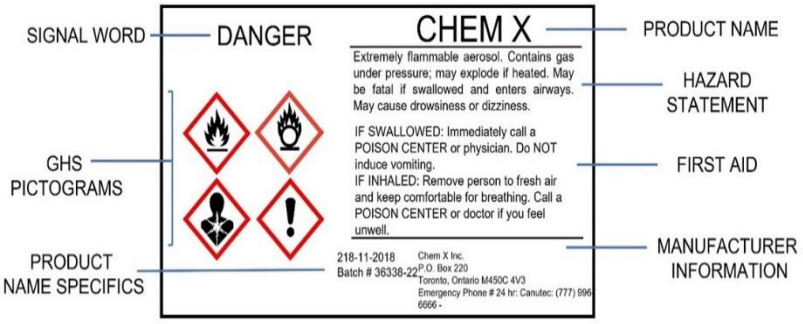
4- Laboratory rules for students:

Simply entering a chemical laboratory requires strict compliance with certain rules
***DO NOT** enter the laboratory without permission.*
***DO NOT** use any equipment unless permitted to do so by the professor. Make sure you know exactly what you are supposed to do. If in doubt, ask the professor.*
*Long hair **MUST** always be tied back securely.*
***ALWAYS** wear eye protection when instructed to do so.*
***ALWAYS** check that the label on the bottle is **EXACTLY** the same as the material you require. If in doubt, ask the teacher.*
***DO NOT** eat, drink or taste anything in the laboratory or any food brought into the laboratory.*

Any substance accidentally taken into the mouth must be spat out
***IMMEDIATELY** and the mouth washed out with plenty of water before reporting to the professor.*
*Any cut, burn or other accident **MUST** be reported at once to the professor.*
*Any chemicals spilled on the skin or clothing **MUST** be washed at once with plenty of water and reported to the professor.*
*Always **WASH** your hands after practical work.*
This list of rules is repeated in Appendix K (p. 83) and should be copied and displayed prominently in each laboratory. The professor must decide if the student needs first-aid and if it is necessary to go to hospital or to see a doctor.
It is essential to emphasize that human safety is the primary consideration at all times.

5- Knowledge of the products used and hazard symbols:

There are three major categories of intrinsic dangers to chemicals:
- Physical hazards (risk of explosion, ignition, etc.).
- Health hazards (acute toxicity, eye damage, reproductive toxicities, etc.).
- Hazards to the environment (danger to aquatic environments).
The handling of chemicals is not safe. Packaging labels contain pictograms (images) and codes showing the risks and safety instructions. The following image shows an example of Labeling elements of a primary chemical container.



Labeling elements of a primary chemical container

6- ***Understanding chemical pictograms***

The Hazard Communication Standard (HCS) requires pictogram labels to warn users of the chemical hazards associated with a substance. Reference the chart below to learn more about the nine HCS pictograms.

		
Health Hazard	**Flammable**	**Harmful**
These substances may cause serious health effects, such as cancer, mutated genes or a damaged respiratory system.	These substances may cause a fire hazard due to spontaneous combustion or flammable gas.	These substances may cause less serious health effects, such as irritation to the skin, eyes or respiratory system.
		
Compressed Gas	**Corrosives**	**Explosives**
These substances have gases under pressure (also known as nonliquefied gases). Examples includepropane, methane and butane.	These substances may corrode or burn metals, skin and eyes. Examples include acids or bases,such as hydrochloric acid.	These substances, such as TNT, mayexplode or react with themselves.
		
Oxidizing	**Environmental Hazards**	**Toxic**
These substances are oxidizinggases, liquids or solids.	These substances, such as zinc oxide, may cause damage to an aquatic environment.	These substances may cause death or poisonous effects from short exposure.

7- ***Some tools and instruments from the chemistry lab:***

For every student, one of the common excitements of the school days remains associated with the discovery and introduction with the laboratory equipment in school labs. Between standard 5 to 8, students get the knowledge of the basic lab apparatus and get to know about their uses. All of these apparatuses are the pillars of every lab, be it in schools, colleges, research labs, or medical laboratories.

 Beaker	 Erlenmeyer	 Flask Round Bottom 2 Neck	 Test tube	 Separating Funnel	 Condenser
 Measuring Cylinder	 Burette	 Lab glass Pipettes	 pipette bulb	 Volumetric flask	 Dropper
 Elevator support	 Watch glass	 Pince en bois	 Spatula	 Funnel	 Retort Clamp
 Reagent Bottle	 Petri Dishes	 Hotplate magnetic stirrer	 Magnetic stirrer	 Bunsen burner	 Weighing machines
 Wash bottles	 Tongs	 Thermometer	 Buchner Funnel	 Retort Stand Bundle	 Crystallising Dish