Experiment 1: Safety and Laboratory Rules

Introduction

Chemistry laboratories can be hazardous if the rules are not followed. During a chemistry course a student may handle materials which are flammable, explosive, poisonous and carcinogenic, and also some of these materials and equipment may also cause severe burns and cuts if handled improperly or carelessly. Most accidents that occur in the chemistry laboratory are a result of carelessness, impatience, improper or unauthorized experimentation, and disregard for safety rules or proper operating procedures.

In order to minimize the chances of an accident in the laboratory certain rules and regulations must be obeyed at all times at all times when working in the laboratory.

Objective of the experiment

1. Everyone who works in a lab is familiar with a set of rules that can lessen the the damage caused by chemical exposure.
2. Operates out chemical operations in the safest environnement possible.
3. To be knowledgeable about first aid procedures.

Laboratory Rules

1. Do not perform experiments in a laboratory alone.
2. Appropriate clothing must be worn at all times while in the laboratory.
3. In the lab, it is completely forbidden to eat, drink, smoke or chew gum.
4. Long hair and loose clothing must be confined while in a laboratory.
5. People who wear contact lenses should refrain from wearing them in laboratories, especially when working with fumes and gases, as this could aggravate damage and preclude first aid treatment.
6. Never touch, taste, or smell any chemicals.
7. All experiments that produce gases or vapours must be carried out under an air extractor.
8. Never use the mouth to fill a pipette use a pipette Filler Rubber.
9. Read the bottle labels carefully before using any chemicals.

10. For instance, even during reactions that are seen as being easy, like dilution, you must add and combine chemicals in the proper order and not at random.
11. Never retern any unused chemicals to their original container.
12. Check the label on all chemical bottles twice before using any of the contents
13. Follow the experiment's progression carefully, then note all of your observations and findings (colour change, appearance of sediments, etc.). It is more beneficial to you to take notes while performing the experiment as opposed to quoting from a colleague's notebook.
14. Never return unused chemicals to their original container
15. After the experiment is over, the used equipment needs to be cleaned and put back where it belongs in the lab.
16. Before leaving the lab, make sure to wash your hands, switch off the water and gas, and turn off the water source.

Chemical storage conditions

Safe chemical storage is a crucial component to prevent chemicals from harming people, property, or the environment. One storage method does not work for all types of materials. There are however essential rules and laws that must be adhered to, some of which are stated below.

1. All chemicals need to be kept in secure locations.
2. Equipping warehouses with regularly distributed ventilation and natural lighting windows.
3. Chemicals should not be stored according to the alphabet, but rather they should be stored according to the type of risk.
4. Leave a space between stored materials and the side walls.
5. Reducing the volume of stored materials as much as possible to suit the needs.
6. Chemicals should be stored away from direct sunlight and heat sources.
7. Equipping the storage area with detectors for gases and leaking materials, depending on the type of stored materials.
8. Chemical stores are equipped with appropriate extinguishing materials according to the type of stored materials.

First aid

The first fundamental rule that must be followed in the event of chemical exposure is to "be calm," and then to be cautious of what you do.

Never attempt to use acids or alkalis to neutralise a liquid because the reaction's heat could make things worse.

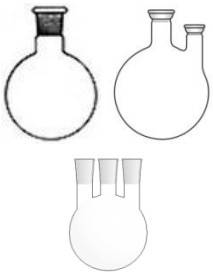
For instance, if a chemical gets into your eyes, you should immediately wash the area with a lot of water before going to the doctor.

Chemical Hazad labels

Chemical dangers are denoted by symbols, where each sign denotes the kind of danger to be anticipated from these substances.

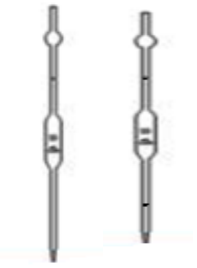
 **Explosive**	 **Corrosive**	 **Toxic**
 **Environmental hazard**	 **Oxidizing**	 **Flammable**
 **Biological hazard**	 **Carcinogen**	 **Radiation hazard**

List of Equipments and tools used in chemical Laboratory



Boiling flasks

Graduated Cylinder



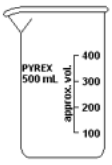
Volumetric Pipet

Gratuated Pipet

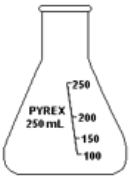
Burette with Burette stand and clamp

Watch Glass

Funnel



Beaker



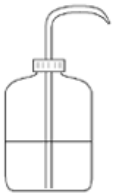
Erlenmeyer flask

Volumetric flask

Separatory funnel

Filter paper

Thermometer



Wash Bottle

Spatula

pH Meter

Conductometer

Calorimeter

Hot Plate

Weighing machine

The right reading when using a graduated cylinder, burette, or pipette.

Water and aqueous solutions will form a concave meniscus when placed in a graduated cylinder or a pipette, so that the meniscus is at eye level, and read the liquid level at the bottom of the curved surface (See Figure 1).

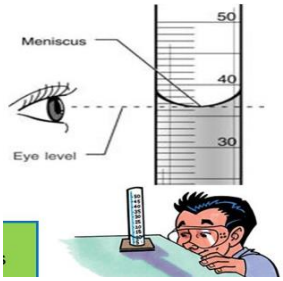


Figure 1. Reading a Meniscus

Writing a Lab Report

Lab reports are a way of documenting and interpreting the data you collect through out your experiment. At the end of each applied work, students are required to submit a report in order to assess their level of comprehension. The following components are typically included in this report.

1. The lab report should begin with the experiment number, title of study, name(s) of the authors,

2. Introduction : The subject under investigation and some background information should be presented in the introduction.

3. Aim of the pratical work : The student outlines the purpose of the experimental work in one or two sentences.

4. Presentation: It is preferable to provide some definitions and theories of experimental work, and it is preferable that they be accompanied by some references.

5. Materials and Equipment: Make a list of all the chemicals and equipments required for the experiment.

6. Methodology: The applicable work's procedures are explained in depth and in orderly fashion so that anyone may understand them and accurately repeat the experiment.

7. Data and results: The student's numerical data collected during the experiment, which includes a range of measurements and observations (temperature increase, appearance of precipitation, change in colour, recording of sizes, etc.).

8. Discussion, analysis, and conclusions: these steps help to explain and analyse the facts and results as well as provide answers to the questions.

9. Conclusion: The student provides a brief summary of the findings.