

Experiment2

Laboratory safety , and identification of the common laboratory glassware , equipments and tools

(1) Laboratory safety:

- 1-** You must come to the lab with a serious awareness of personal liability and utmost consideration for others in the lab.
- 2-** You must acquaint yourself with safety equipment location, acid-base neutralizing agents, eye wash, fire extinguisher, emergency shower, broom & dustpan and broken glass container.
- 3-** You must listen carefully to all the instructions given by your instructor. If you are unsure of anything, always ask your instructor.
- 4-** You must immediately clean all chemical spills.
- 5-** While handling the chemicals you must wear gloves otherwise some chemicals may result in skin irritation.
- 6-** While handling all electrical and heating equipments extra precautions must be taken to prevent shocks and burns.
- 7-** Do not handle any broken glassware with your bare hands; use a broom and a dust pan to collect the pieces.
- 8-** You must wash your hands with soap after finishing the experiment.

(2) Identification of the common laboratory apparatuses:



Pipetting techniques

Objective:

- (1) For students to become familiar with the use of pipetting techniques.
- (2) To ensure the accuracy of pipette

Introduction:



There are two main type of pipettes are used in biochemical laboratory:

- (a) Volumetric or transfer pipettes
- (b) Graduated or measuring pipettes

(a) Volumetric pipettes(Transfer):

are designed to deliver a volume of a liquid and consists of a cylindrical bulb joined at both ends to narrowed glass .

Steps of the Use of the pipettes:

- ✓ The pipette is washed with water
- ✓ rinsed several time with a little of the solution to be used
- ✓ filled to just above the mark , the liquid is allowed to fall to the mark .
- ✓ The content are allowed to drain into the appropriate vessel with the jet of the pipette touching the wall of the vessel .
- ✓ After the flow of the liquid has stopped the jet is held against the wall for some times and then removed , a certain amount of liquid will remain at the tip and this must not be "blown out".

(b)Graduate pipette:

these consists of glass tube of uniform bore with spaced along the length ,, there are two types of graduated pipette are available:

1-Mohr; graduated between two marker

2-Serological;pipettes with graduation mark down to the tip.

some are of the blown out type(stated on the stem),,and other do not blown out.

Material and Apparatus:

pipettes , Beaker , Distilled water , balance , Mesuring cylinder

Method

Part 1

Exame the 3 pipette placed on your laboratory bench . record their types and the volume of their smallest division .

<i>Pipette</i>	<i>Type</i>	<i>Smallest division</i>
<i>A</i>		
<i>B</i>		
<i>C</i>		

Part 2

Using distilled water , pipette and measuring cylinders into weighted beaker 1 and 2

1-with 5ml graduate pipette(Mohr) =5ml water

2-wuth 5ml measuring cylinders =5ml water

	Weight of the beaker	Weight of beaker +water	Weight of water
1- graduate pipette			
2-measuring cylinder			

Discussion

Questions:

1-Measuring cylinder cannot be a substitute for the pipette or a burette?

(3)Identification of the common laboratory Equipment:

(A)Balance

(B)Spectrophotometre

(C)PH meter

PH Meter:



Objective:

to learn how to handle the PH meter and to measure PH values

Introduction:

As the hydrogen ion concentration of many solution is very low and difficult to measure accurately, PH term a convenient way of expressing hydrogen ion concentration .there are many ways in biochemical laboratory to measure PH value such as ; litmus paper, a field kit and PH meter . And The most accurate and reliable method is PH meter.

PH define as : the negative logarithm of hydrogen ion concentration

$$PH = - \log_{10} [H^+]$$

the measurement of PH is one of the most important and useful analytic procedure in biochemical lab. Since the PH determines many important aspects of the structure and activity of biological macromolecules and thus of the behavior of the cell and organisms .

Note: PH range value (0 - 14) ,, the higher PH number , the lower the hydrogen ion concentration and vice versa..

-There are two type of PH meter hydrogen electrode and glass electrode. the glass electrode is use in biochemical lab.

Glass electrode:

the glass electrode consist of a very thin bulb ,blown onto a hard glass tube. The bulb is made of high conductivity glass which is sensitive to PH. Yhe bulb contains a solution of hydrochloric acid (0.1N) and is connected to platinum lead via silver chloride electrode which is reversible with respect to hydrogen ions . The glass electrode is very sensitive and readily responds to changes in hydrogen ion concentration .

Material and apparatus:

PH meter , buffer sol. of known PH value , distilled water , Acetic acid 0.2M(A) , Beaker , Solid sodium hydroxide 0.1M(B) , Measuring cylinders .

Method:

1-standardize the PH meter by placing the electrode in a solution of known PH(PH 4 , 7 , 9) .

2-Wash the electrode with distilled water and dry by tissue then put it into sample solution A & B , read PH .

Note: After use the electrode you should storage it in distilled water and never be allowed to dry out .IF the electrode get dry it will required reactivation.

<i>Solution</i>	<i>PH Value</i>
<i>Standard PH 4</i>	
<i>Standard PH 7</i>	
<i>Standard PH 9</i>	
<i>A</i>	
<i>B</i>	

Discussion:

Questions:

1-Why it is important to measure PH accurately?

2-A PH meter must be standardized against a solution?

3-Three different solution have PH Values 3 , 7 and 10

solution 1 is basic (T or F)

solution 2 is neutral (T or F)

solution 3 is acidic (T or F)