pH Meter

It is a scientific instrument that measures the hydrogen-ion concentration in a solution indicating its acidity or alkalinity expressed as pH . pH is the unit that describes the degree of acidity or alkalinity. It is measured on a scale of 0 to 14.

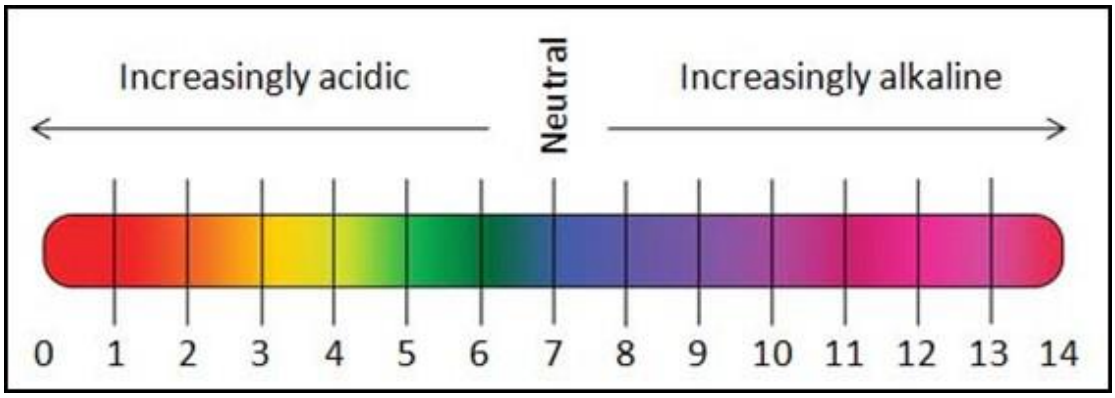
The pH value of a substance is directly related to the

ratio of the hydrogen ion [H+] and the hydroxyl ion OH-] concentrations.

*If the H+ concentration is greater than OH-, the material is acidic (pH) value is less than 7.

*if the OH- concentration is greater than H+, the material is basic(pH) value greater than 7.

*if equal amounts of H+ and OH- ions are present, the material is neutral (pH) of 7.



pH range	Description	Colour
0-3	Strong acid	Red
3-6	Acid	Orange/Yellow
7	Neutral	Green
8-11	Base	Blue
11-14	Strong base	Violet/Purple

Parts of pH meters:

1-Electrode : There are two types of electrode:

A-Glass electrode (Measuring electrode).

B-Reference electrode (Calomel electrode).

2-Electrode holder.

3-Amplifier .

4-Galvanometer or Digital display.

5-Temperature knob .

6-Adjustment knob .

Types of pH meters:

•Manual pH meter.

•Digital pH meter

Applications of pH meter:

know the acidity of the water.

•Chemical laboratory analyses.

•Soil measurements in agriculture.

•Water quality for municipal water supplies.

•Environmental remediation.

•Brewing of wine or beer.

•Healthcare and clinical applications such as blood chemistry.

pH ranges for a healthy individual :

	Lower range	Upper range
tears	6.5	7.6
urine	4.5	8.0
saliva	6.2	7.4
blood	7.2	7.45: Arterial:7.4 Venous:7.35
Gastric secretion(in stomach lumen)	1.0	2.0
sputum	7.54(normal)	7.06(uncontrolled asthma)

Microtome

It is an instrument which is used for cutting of materials in different thickness that are used as microscope slides , allowing samples to be observed under transmitted light or electron radiation.

Microtomy is a method for the preparation of thin sections of materials such as bones, minerals and teeth for thorough examination. Microtome sections can be made thin enough with section thickness between 50 nm and 100 μm.

Types of Microtome:

1-Rotary microtome :

2- Freezing microtome :It is using for cutting section

:when

1.Speed of the utmost in portances

2.When it is required to demonstrate fat histological.

3.When neurological structure are to be studies.

3-Ultra microtome

4-Laser microtome

5-Saw microtome :It is used for hard material such as

teeth or bones.

6-Vibrating microtome : It used for difficult biological

Samples.

7-Sledge microtome

8- cryo microtome

Parts of microtome:

1-Body with cover

2-Operating handle with brake

3-Knife

4.-Angle of tilt adjustment

5.-Base with knife carrier

6.-Knife clamps with screw

7.-Micron adjustment with thickness gauge

8- Coarse adjustment of micron.

Types of knives according to material that made of:

1- Steel blades : There are used to prepare sections of animal or plant tissues for light microscopy histology.

2- Glass knives : are used to slice sections for light microscopy and to slice very thin sections for electron microscopy.

3- Diamond knives : are used to slice hard materials such as bone, teeth and plant matter for both light microscopy and for electron microscopy.

4-Gem quality diamond knives : are used for slicing thin sections for electron microscopy.

Uses of microtomes:

1.Fix the paraffin block on block holder.

2.Rotate the operating handle and close the knife.

3.The section cutting effected by the vertical and fall of the object and fix the knife edge.