pH Meter

pH meter is an electric device used to measure hydrogen-ion activity (acidity or alkalinity) in solution.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.

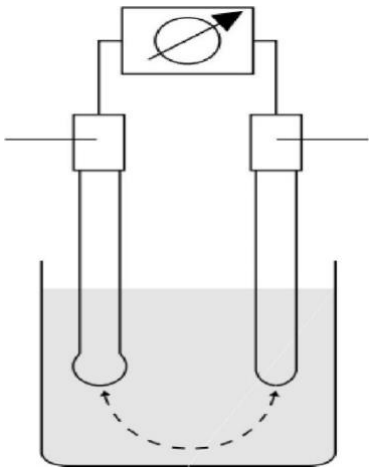
❖ Ph indicator:

A pH value of 7 indicates a neutral solution. Pure water should have a pH value of 7. (pH = 7)

pH values less than 7 indicate an acidic solution. (pH< 7 acid) pH value greater than 7 will indicate an alkaline solution. (pH >7 basic)

❖ Principle of pH Meter

pH meter measures the difference in electrical potential between a pH electrode and a reference electrode. The difference in electrical potential relates to the acidity/alkalinity or pH of the solution.

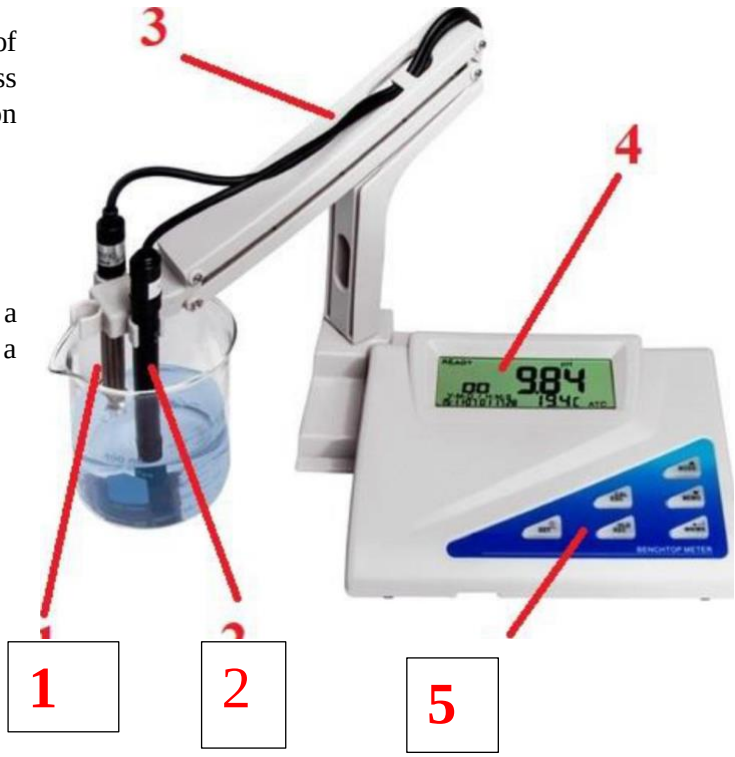


pH electrode reference electrode

Medical Lab. Instrument

❖ Parts of pH Meters.

I-Glass electrode: (Ag/AgCl + HCI): At the end of this detector electrode is a very thin glass membrane that is sensitive to hydrogen ion concentration.



2-Reference electrode:القطب المرجع:-

It consists of a platinum wire (Pt) immersed in a paste (Hg2C12) with mercury liquid and a saturated KCI solution.

3- Electrode holder.

4- Digital display.

5- keypad.

❖ Calibration of pH Meter

l- Turn on your pH meter.

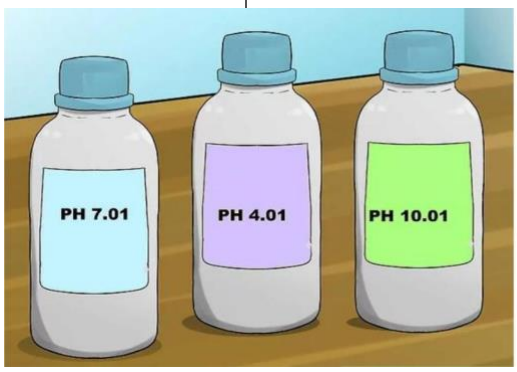
2- Clean the glass electrode

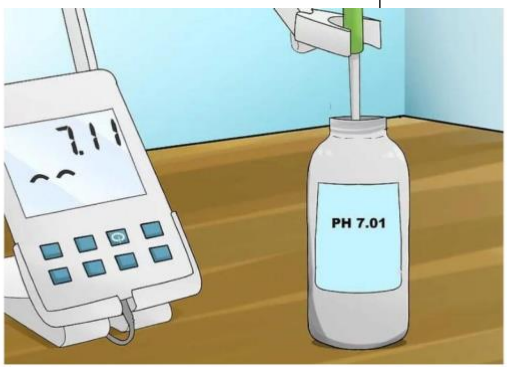
3- Prepare your buffers.

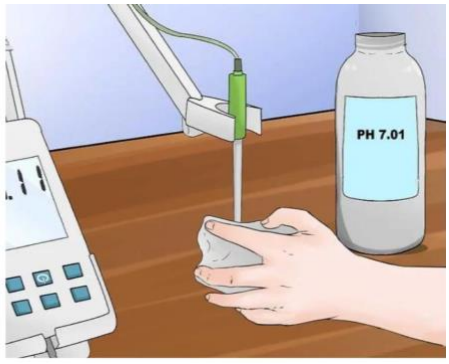
4- Place your electrode in the buffer with a pH value of (7) and begin reading.

5-Rinse your electrode with distilled water

6- Place your electrode in the buffer with a pH value of (4) and begin reading







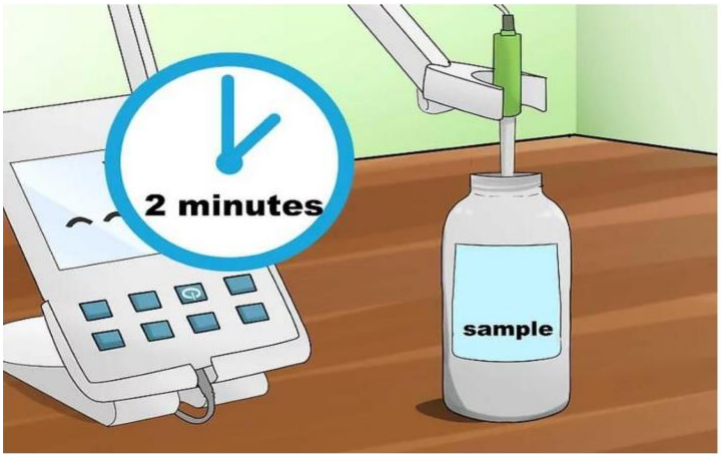
❖ Using of pH Meter

l- Place your electrode in your sample and begin reading. Once your electrode is placed in your sample, press the measure button and leave the electrode in your sample for approximately 1-2 minutes.

2- Set your pH level

3- Clean your electrode after use. Rinse your electrode with distilled water and blot or dab dry with a lintfree tissue.

[not: Between each measurement and the other should be considered clean Glass electrode with distilled water and dried before use once again]



Step 1

Step 2

Step 3

The Microtome

A microtome is a mechanical instrument used to cut biological specimens into very thin segments for microscopic examination. Most microtomes use a steel blade and are used to prepare sections of animal or plant tissues for histology.

The principle of Microtome

the motion of the sample holder, the sample is cut by the knife position 1 to position 2, at which point the fresh section remains on the knife. At the highest point of the rotary motion, the sample holder is advanced by the same thickness as the section that is to be made, allowing for the next section to be made.

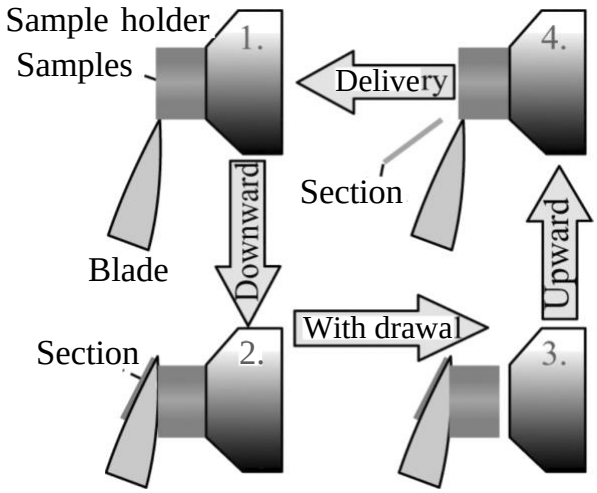


Figure 1 : principle oJ Microtome

Types of microtomes.

1. Rotary microtome
2. Ultra-microtome
3. Freezing microtomes
4. Saw microtome
5. Cryostat microtome

figure 2: Ultra-microtome

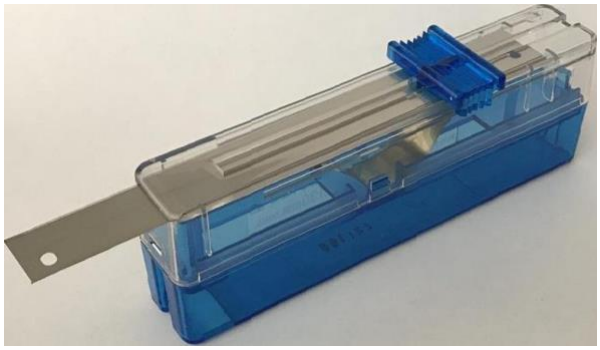
Types of microtome Knives

1- Glass knife

2- Diamond knife

3- Sapphire knife

4- Disposable knife



Figur 3: Disposable knife

Parts of Microtone

- Block holder
- Knife
- Knife clamps
- Block adjustment
- Thickness gauge
- Angle of tilt adjustment
- Operating handle
- Internal and external lock

Figure *4: the Rotary microtome*

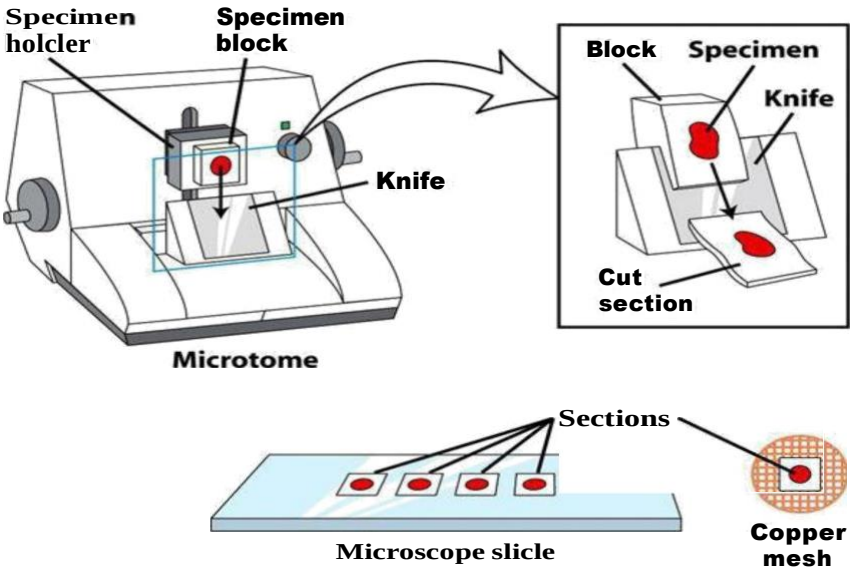
Microtome operation (sectioning)

1- Set the desired section thickness using the thickness setting knob at the front of the microtome on the right and check the value in the display window (figure 5).

2- Use a different area of the cutting edge (blade) for trimming than for sectioning. Use caution when repositioning blades and always ensure they are clamped back in place.

3-For sectioning, turn the handwheel, evenly in a clockwise direction. Repeat until desired number of sections are cut.

4- Pick up the sections and mount them on microscope slides by preferred method.



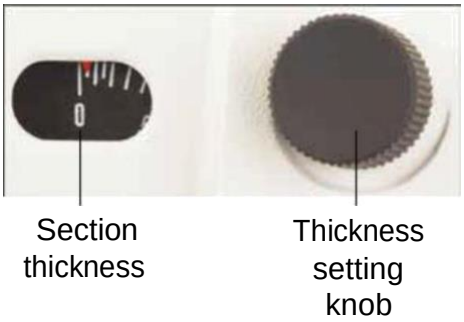


Figure 5: Thickness **pouge**