



Medical laboratory instrument

Lecture four

Reyam Abdulkhuder Mohammed

Al-Mustaqbal University College

Balance

Is essential laboratory instruments that are widely used for determining weight of various substances (powders ,crystals and chemical materials) in the laboratory for used to prepare reagents, stains and culture media , balances are required to weight accurately within the needed range.

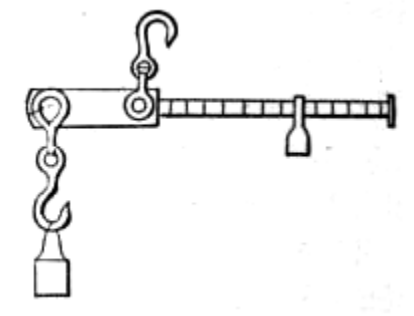
The balance should be kept clean and located in an area away from :

- large pieces of electrical equipment .
- open windows to minimize any vibration as interference that may happen.

** a slab of marble is placed under the balance.

Types of balance

1-Beam Balance: This type of balance uses a comparison technique in the form of a beam with arms of unequal length, It has a weight that gradually slips into the longer arm , to estimate the weight



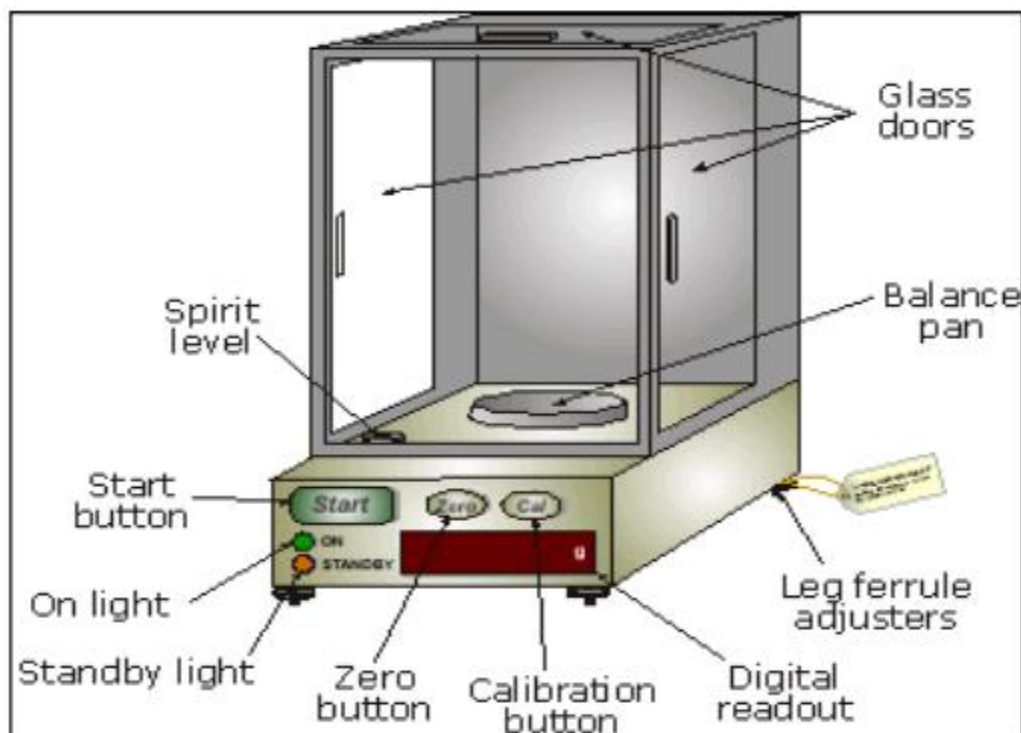
Analytical Balance: It is used to measure mass to a very high degree of precision. The weighing pans are inside see-through enclosure with doors so that dust does not collect and so any air currents in the room do not affect the delicate balance

These balances are used

To weigh small quantities usually in miligram(mg).

. range

. When great accuracy is required.



analytical balance

Parts of analytical balance

- . **Pan**: Flat rigid support on which the specimen is placed -
- . **Glass doors**: Sliding door that provide easy access to the-
.inside of the glass case
- . **Digital readout**: To show various numeric information-
- . **Zero button** -
- . **Calibration button**

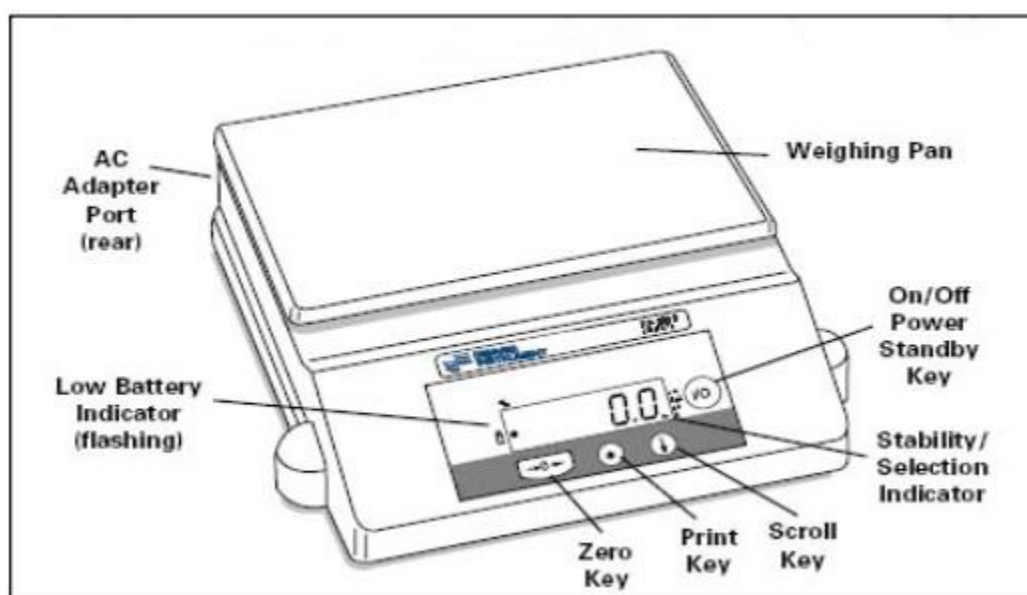
Types of Analytical Balance

A- Single-Pan Mechanical Balance: These consist of a beam with two knife-edges, one to support the -
. weighing pan and the other acting as a pivot
- fixed counterweight balances the load on the pan.

B-Two-Pan Analytical Balance: These balances consist of a symmetrical beam and three knife-edges.
The two terminal knives support the pans and a central knife-edge acts as a pivot about which the beam swings

C- Electronic Single-Pan Balance: These are top loading balances with the applied load being measured by an electromagnetic force unit or a strain gauged load cell. Single-pan electronic balances give a direct reading of the mass applied.

D- Microbalance: This type of analytical balance is capable of measuring samples to at least (1) million parts of a gram. The more sensitive quartz crystal microbalance (QCM) measures mass by measuring the change in frequency of a piezoelectric quartz crystal



Microbalance

Use and care of balances

- 1-Read carefully the manufacturer's instructions
- 2-Always handle a balance with care
- 3-Before starting to weigh, zero the balance as directed by the manufacturer. If using a beam . balance, check the position of the beam
- 4-Weight the chemicals at room temperature in a weighing scoop or small beaker. Never put the chemicals directly on the balance pan

5-When adding or removing a chemical remove the container to avoid spilling any . chemical on the balance

6-Use small brush to remove any chemical which may have been spilt on the balance

7-Silica gel should be kept inside the analytical balance case to remove any moisture present in the atmosphere