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General Laboratory Apparatus

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Basic Equipments and Instruments used in Chemistry laboratory:

Balance:

It is an instrument for measuring mass.

Pipettes:

They are used to transfer of known volumes of liquids from one container to another.

Common types are shown in the figure:

(a) Volumetric or bulb pipette delivers a single fixed volume of liquid.

(b) Mohr or graduated pipettes are calibrated in convenient units to permit the delivery of any volume up to the maximum capacity.

(a)

(b)

(c)

(d)

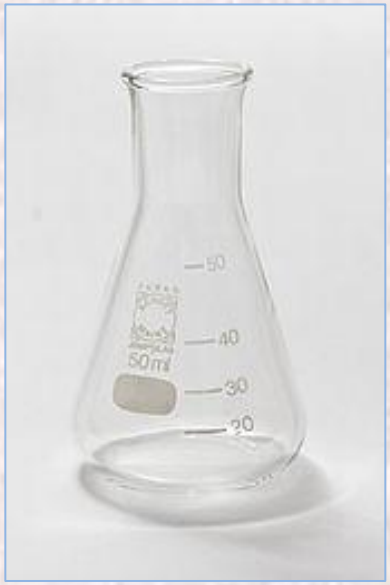
(a) Volumetric, bulbe, pipette.
(b) Graduated pipette.
(c) Digital pipette.
(d) Syringe.

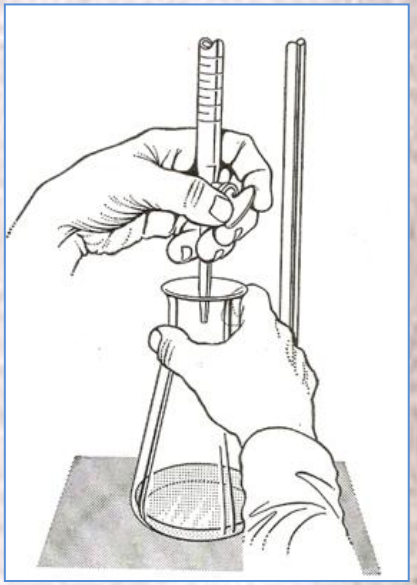
Flasks:

There are various types of flasks:

Erlenmeyer or Conical Flask:

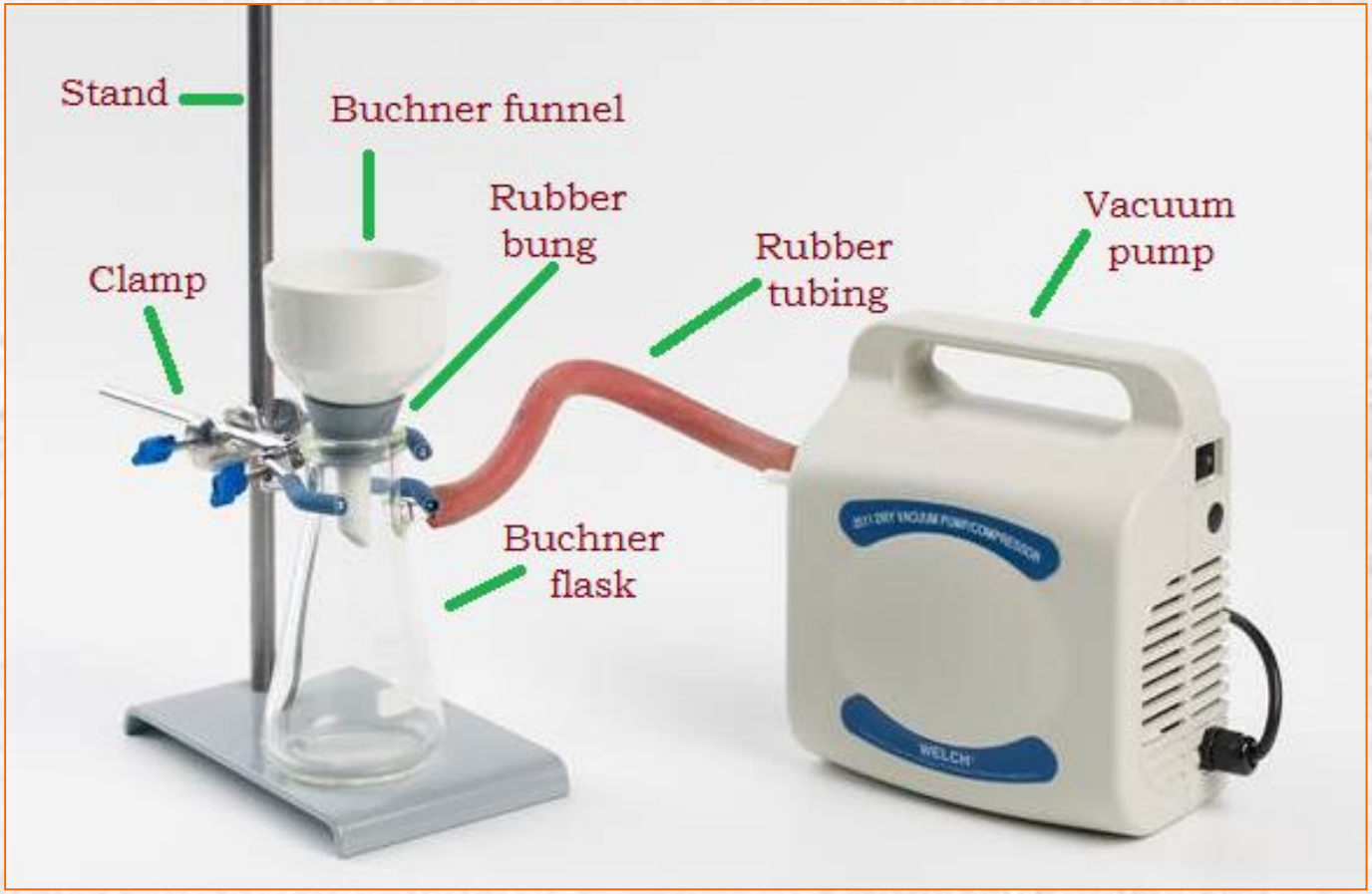
It's used in chemistry labs for titration , as they can hold the contents mixed single-handed leaving the other hand free to add the reagent .





Buchner (Vacuum) Flask:

It's a thick - walled Erlenmeyer flask with a short glass tube , used for filtration of sample under vacuum.



Buchner (Vacuum) Flask

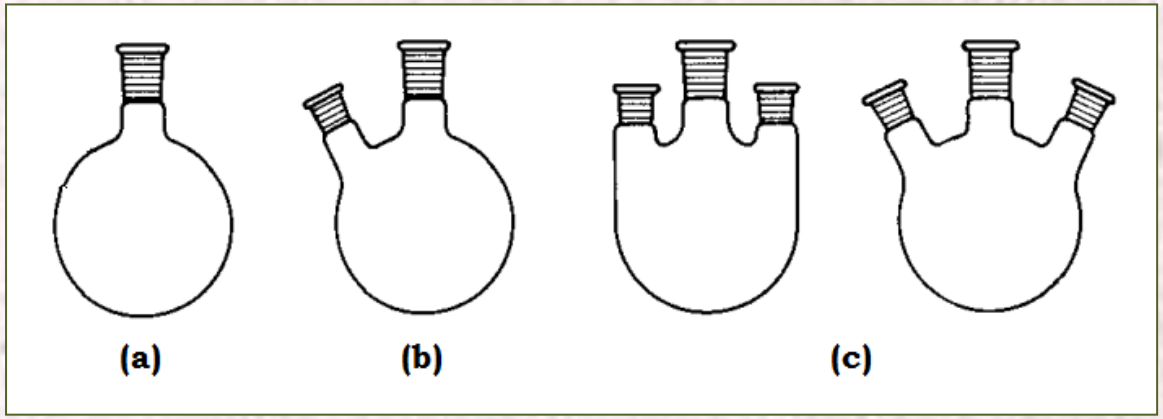
Volumetric, Measuring or Graduated , Flask:

It is a pear - shaped, with a flat bottom , it's neck is elongated and narrowed with an single etched ring graduation marking .

There are different sizes of volumetric flasks which are used for precise dilution and preparation of standard sol-utions.

Boiling Flask:

They are used for boiling liquids and in dist - illation apparatus.



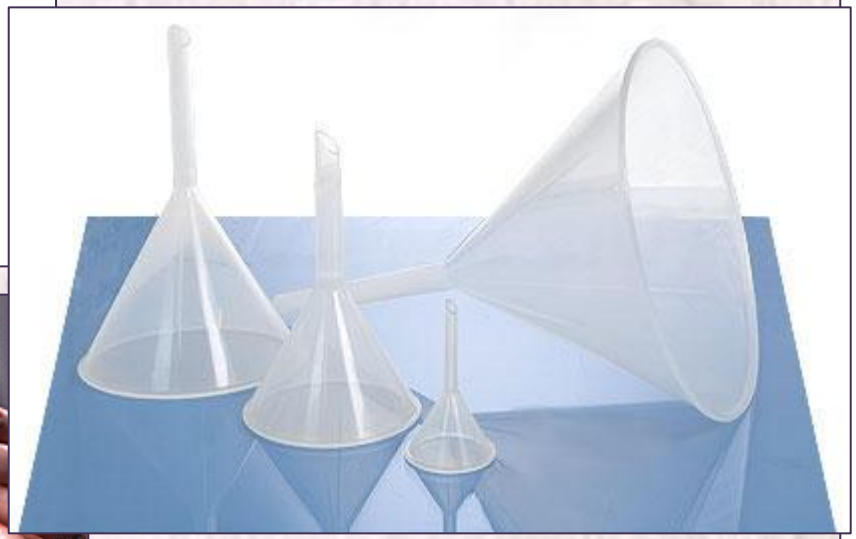
(a) is a round – bottomed boiling flask .
(b & c) are multi – necked round – bottomed Boiling flasks .

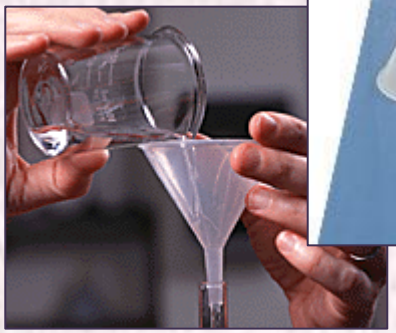
Funnels:

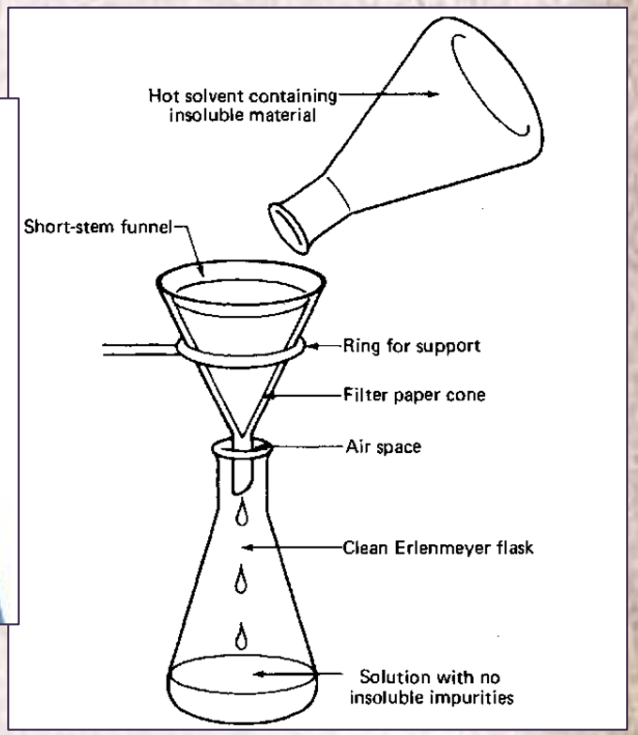
Various types of funnels are present:

Ordinary Funnel:

It's used for filtration and transfer of liquids and powder from one container to another.

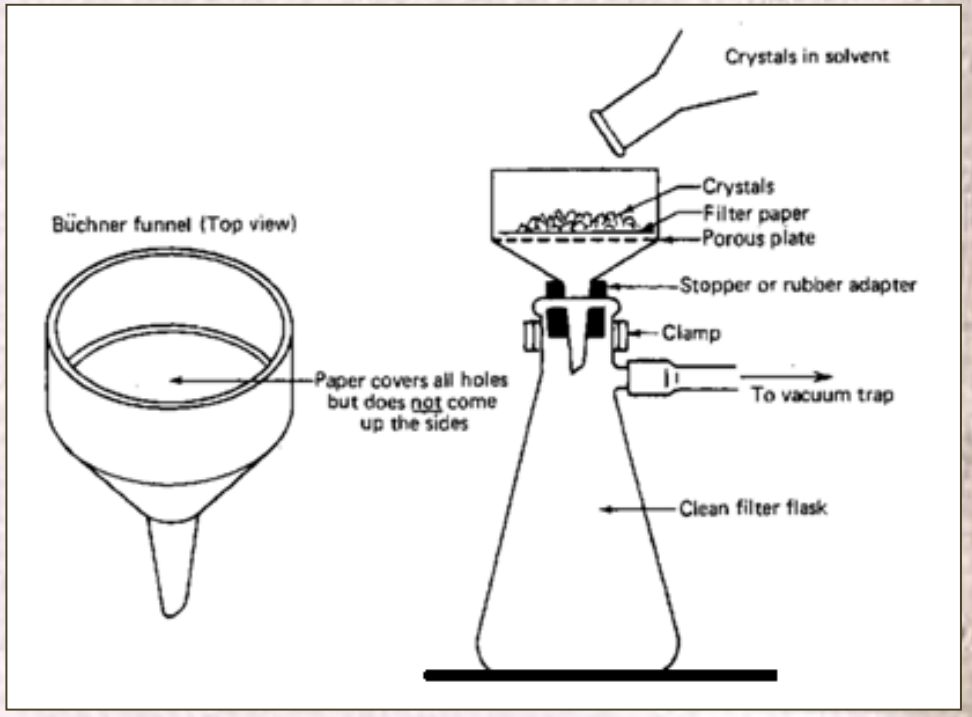






Buchner Funnel:

It's made of porcelain and it has a perforated porcelain plate to support a filter paper.
A Buchner funnel is used in conjunction with a filter (vacuum) flask or tube for filtration by suction, (*vacuum filtration*).

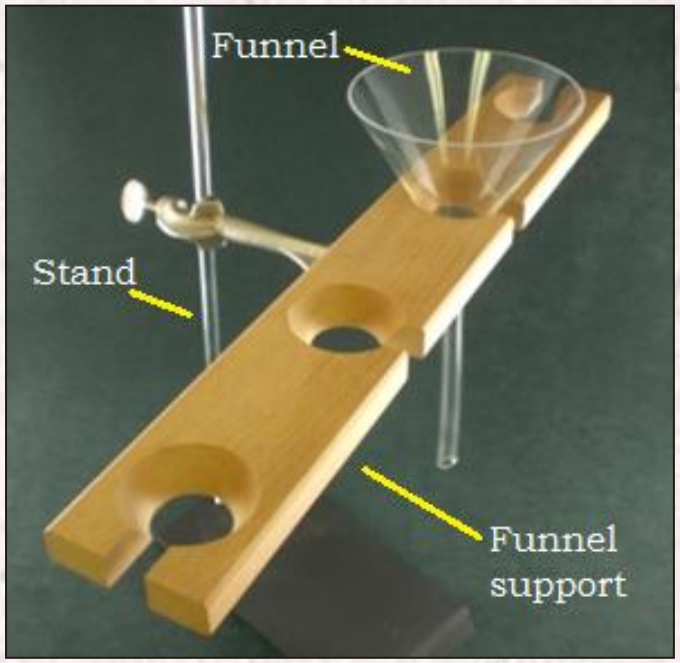


Separatory Funnel:

It is used for separation of two or more immiscible liquids, (*extraction process*).

Funnel Support:

It is used to support and hold funnels.

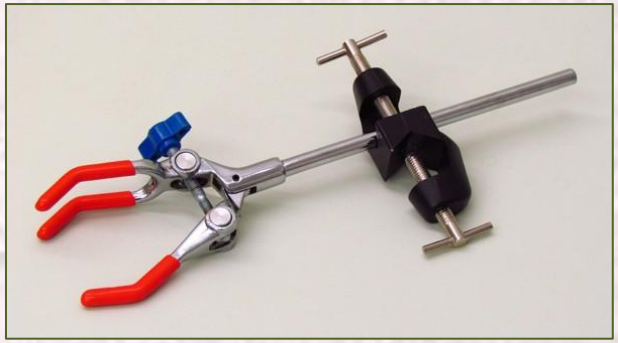


Stand:

It is used to support equipments.

Clamp:

When attached to the stand, this clamp is used to hold a large glassware above the lab table.

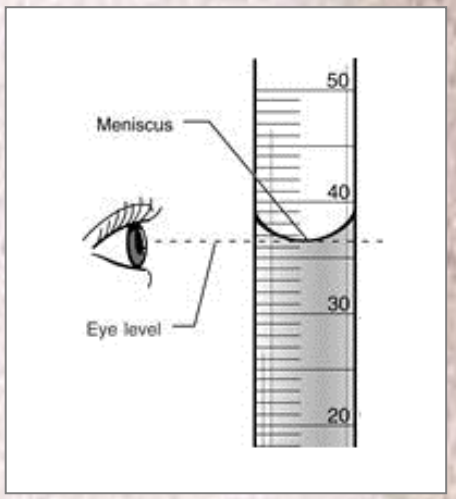


Iron Ring:

It's used to support glassware above the lab table.

Graduated Cylinder:

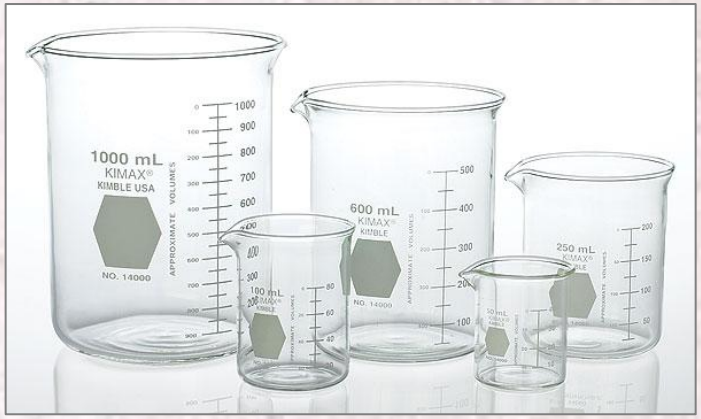
They are not highly accurate , but they are often used to measure specified quantities of liquids.



Beaker:

It is of multipurpose and essential in the lab.

Beaker is used to hold liquids.



Reagent Bottles:

They can be used for storage of chemical reagents .

Washing Bottle:

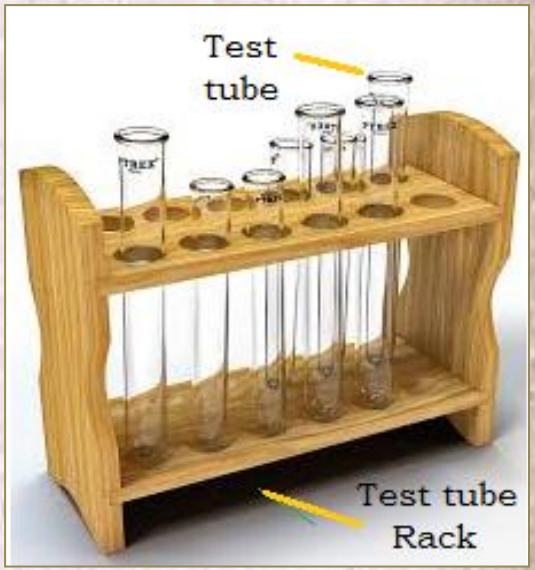
It's filled with distilled water to wash & clean laboratory glass-wares & rinsing solids out of a container when filtering.

Test Tubes:

They are widely used by chemists to hold, mix or heat small quantities of solid or liquid chemicals, especially for qualitative assays and experiments.

Test Tube Rack:

It is used to hold test tubes while reactions happen in them or while they are not needed.



Test Tube Holder:

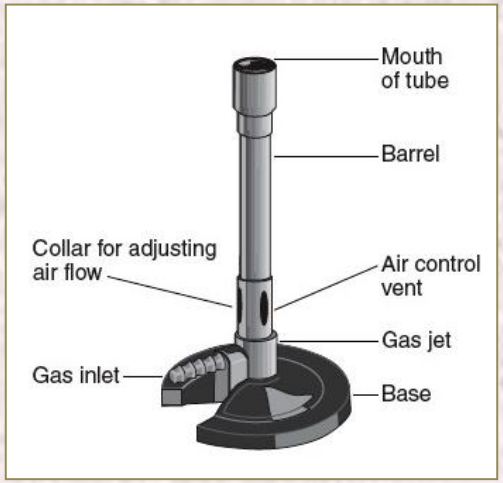
It is used to hold test tubes when they are hot & untouchable .

Test Tube Brush:

Test tube brush is used to easily clean the inside of a test tube.

Bunsen Burner:

It is used for heating and exposing items to flame.

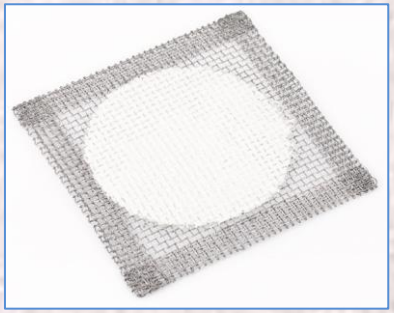


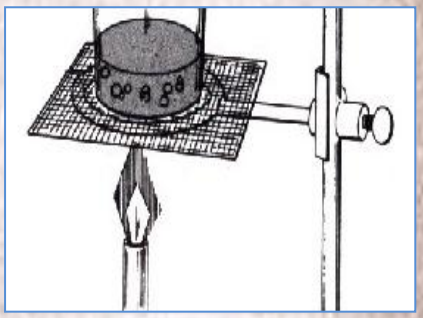
Ring Stand:

Ring or tripod stands are used to hold items being heated .

Wire Gauze:

Wire gauze, when placed between glassware & a heat source , diffuses the heat somewhat and is therefore safer than a direct flame .





Spatula:

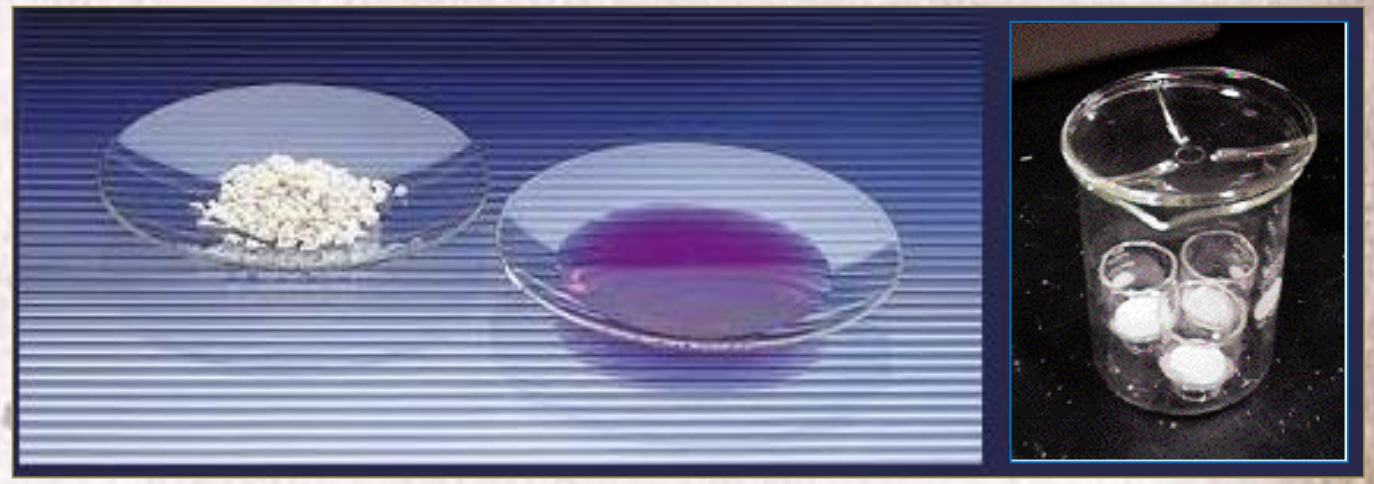
Stainless steel and nickel spatula is used for handling of small quantities of material.

Filter Paper:

It's an important filtering medium.
Ashless paper is made from cellulose fiber .

Watch Glass:

It is used to hold solids when being weighed or transported .
It can also be used to cover beakers .
It should never be heated .



Stirring Rod:

It is a glass rod used for stirring of liquids .

Rubber Policeman:

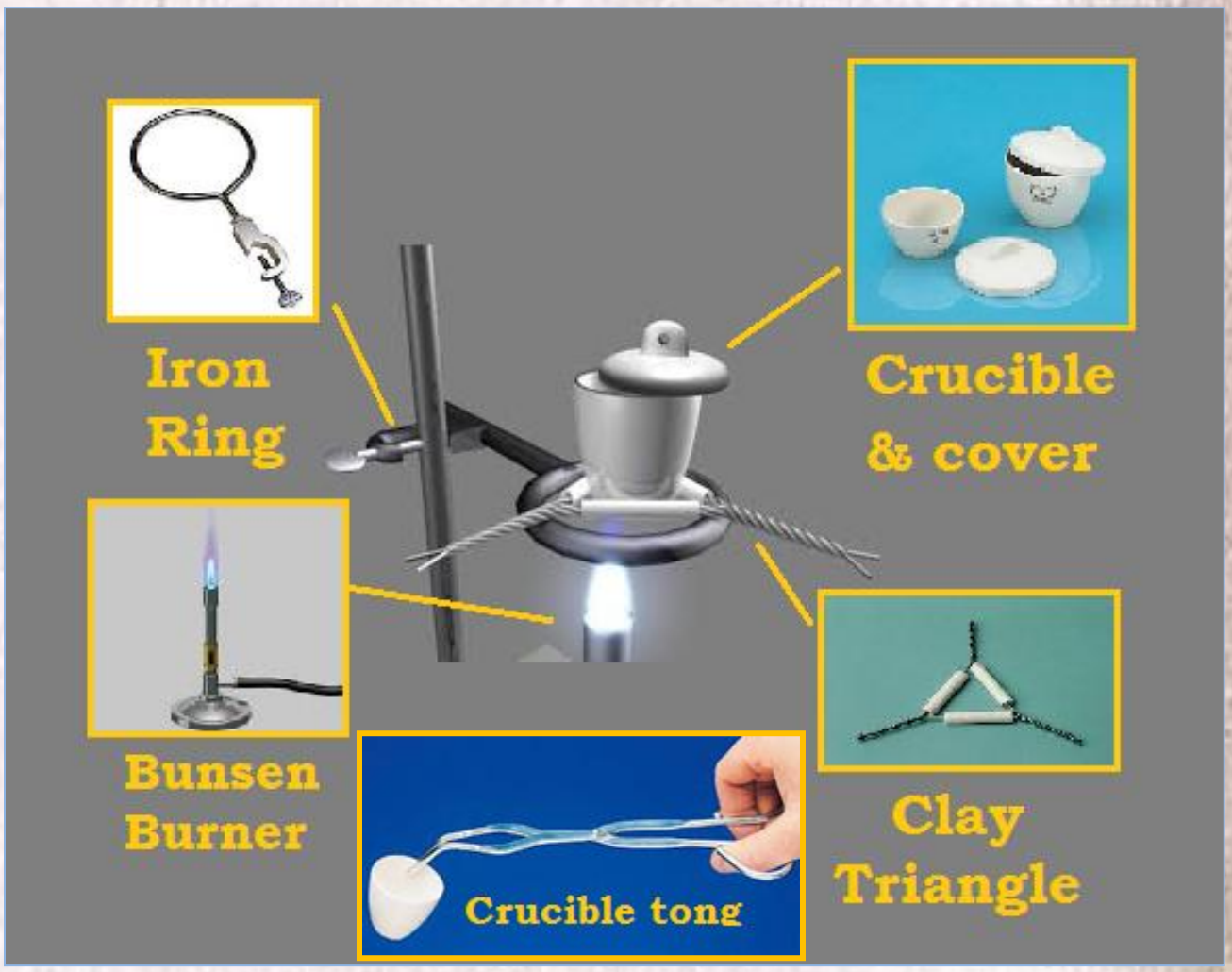
It's a small section of rubber tubing that has been crimp - ed on one end.
The open end of the tubing is fitted on to the end of a stirr - ing rod.
It is used in chemical lab. to transfer residues of precipitate or solid on glass surfaces when performing gravimetric analysis.

Crucible and Cover:

Crucibles are used as a container when some – thing requires "strong" heating.

Crucible Tong:

These tongs are used for picking up crucibles and crucible covers only.

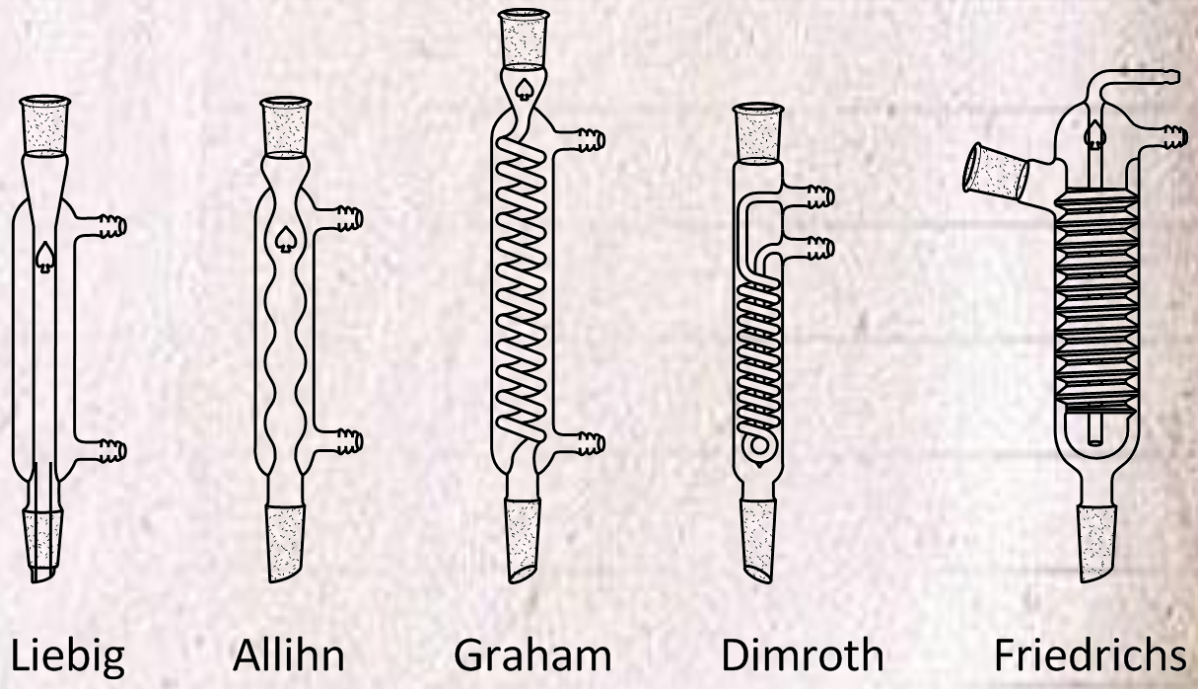


Clay Triangle:

It's used to hold crucibles when they are being heated . It usually sit on a ring stand .

Reflux Condenser:

It's employed for both reflux and for downward distillation.

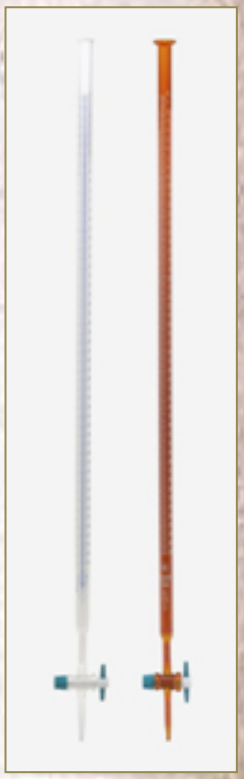


Vacuum Desiccators :

Solids which are moist with either water or organic solvents are routinely dried in a vacuum desiccators at room tempera – ture .

Burettes:

Burettes, like measuring pipettes, make it possible to deliver any volume up to the maximum capacity of the device. The precision attainable with a burette is greater than the precision with a pipette . Burette is used in titrations to measure precisely how much liquid is used.



- What are the rules that should be followed to prevent contamination of reagents & solutions?
- What are the general rules of safety working in a chemical laboratory?

Referance:
Douglas A. Skoog , West , Holler and Crouch, Fundamentals of Analytical Chemistry, 9th edition, page 14 - 47, 2014.