



**College of  
Medicine**



**Department of Medical Chemistry**

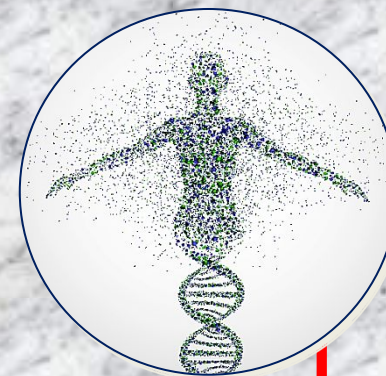
**Practical Medical chemistry**

**Lecture  
.No  
1**

**Glassware and  
Instruments in Lab**

**First  
Stage**

**Prof. Dr. May Jaleel**



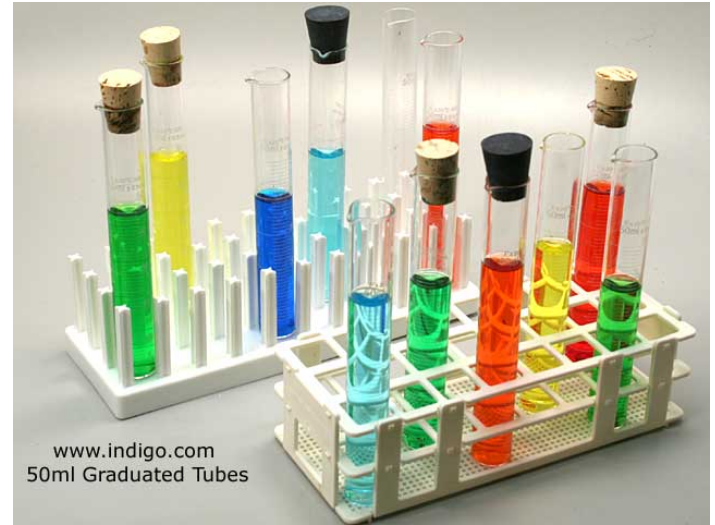
# General Laboratory supplies

## Laboratory ware

Most of laboratory ware used in medicalchemistry laboratory is made of either **glass or plastic**.

# Test tubes

- Available in **different lengths and widths** to serve a varying number of needs.
- Usually used for **liquid samples**, during chemical procedures and experiments
- Often, formed of Pyrex to allow heating of samples.
- **Types of tubes**



**Test tubes**



**Sample tubes**



**Centrifuge tubes**

# Test tube Racks

- Made from **wood**, **iron** or **plastic**.
- Available in **different sizes**



# Beakers

- A simple **container for liquids**.
- Very commonly used in laboratories **for boiling and preparing solution**.
- Generally **cylindrical** in shape, **with a flat bottom**.
- Available in a **wide range of sizes**, from 1 mL up to several litres



# Flasks

- A flask has a **wide "body"** and **narrow neck** with an opening at the top
- They have **different sizes**
- They are used for:
  - making, collecting and measuring solutions
  - chemical reactions, mixing, heating, cooling or dissolving,
- Several types having different functions;
- The most **common types** are:



Erlenmeyer flasks



Volumetric flasks



Boiling flasks

# Erlenmeyer Flasks (Conical flasks)



- Used for **simple measuring**, **storing** and **mixing** of liquids
- It has a **conical base** with a **cylindrical neck**.
- Usually marked on the side (**graduated**) to indicate the **volume** of their contents.

# Volumetric Flasks



- Used to measure a **very precise** and **accurate** amount of a **liquid**.
- Come with a stopper or cap.

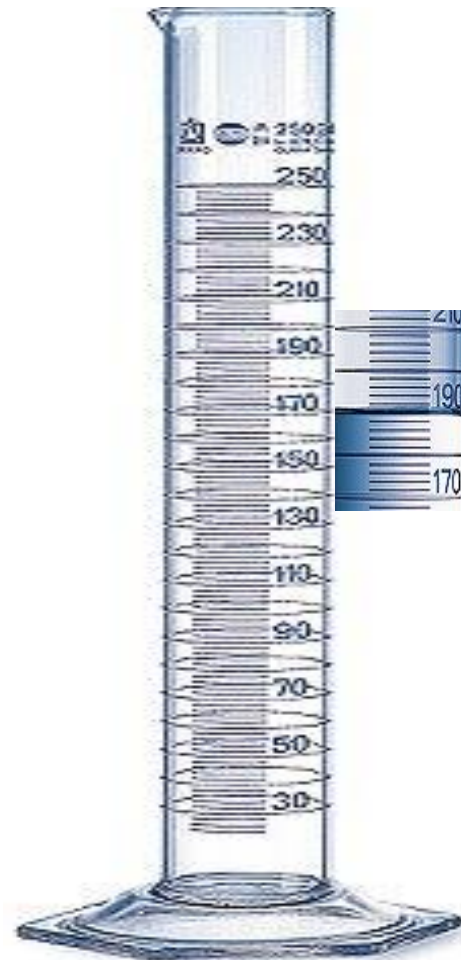


# Measuring cylinders

- **Graduated** cylinders are used for **accurate measurements** of different **volumes** of liquid.



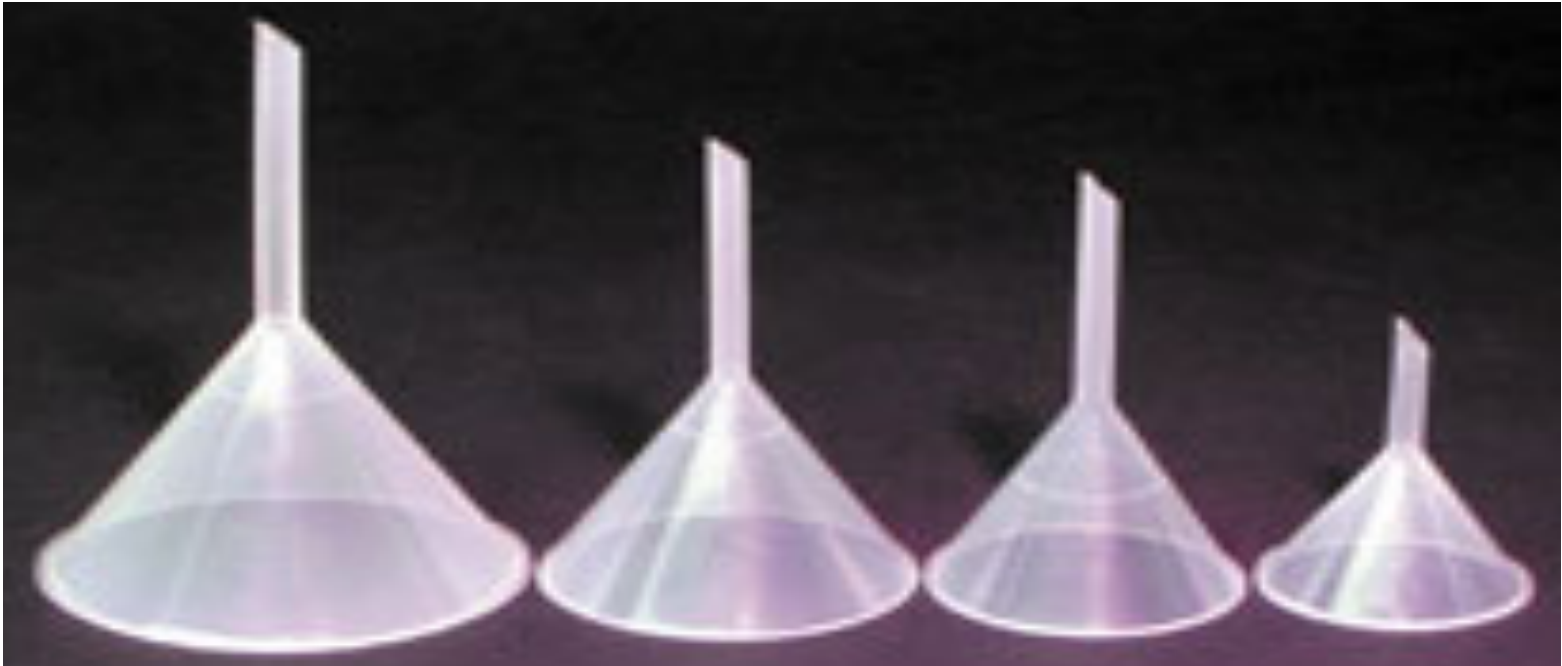
Plastic cylinders



Glass cylinder

# Funnels

- Uses:
  - To **hold filter papers** when filtering fluid
  - For **pouring liquid** into narrow neck containers.
- They have **different sizes**.



# Reagents Bottles

They are available in **different sizes** and may be made of **brown** colored glass.



# Dispensers

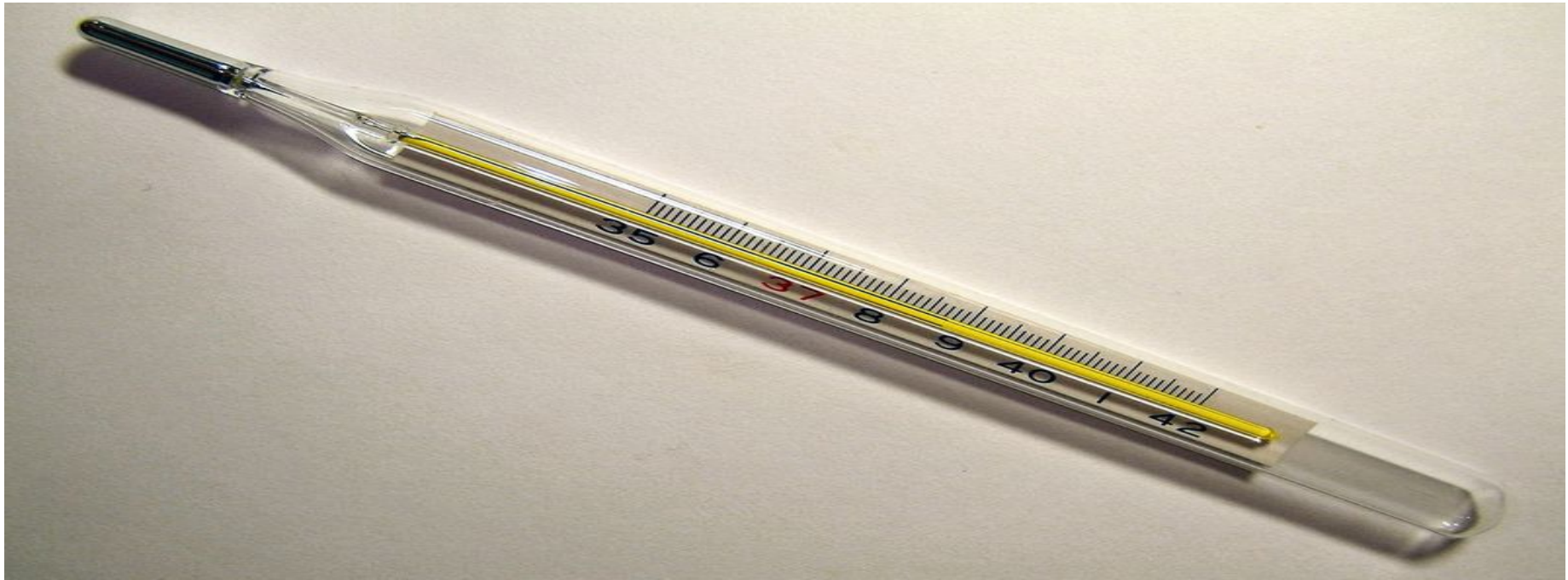
Used **to deliver liquids** including **strong acids, alkalis and solvents**.



# Thermometers



A thermometer is a device which measures temperature



# Pipettes

- Used to transport a **measured volume of liquid.**
- **Types:**1. Automatic pipettes  
2. Glass pipettes



## Glass Dropper Pipet

A droper pipet is used to transfer a small volume of liquid, usually one drop at a time.



On top of each pipet is a “rubber bulb” – **never** put your mouth on the dropper to provide suction

# Pipettes

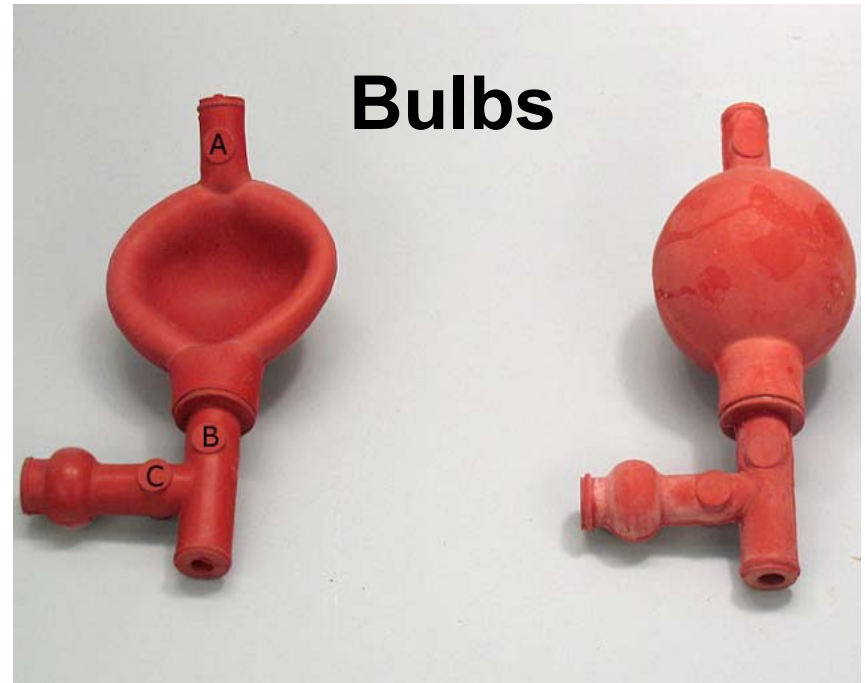




# Pipette Pumps and Bulbs

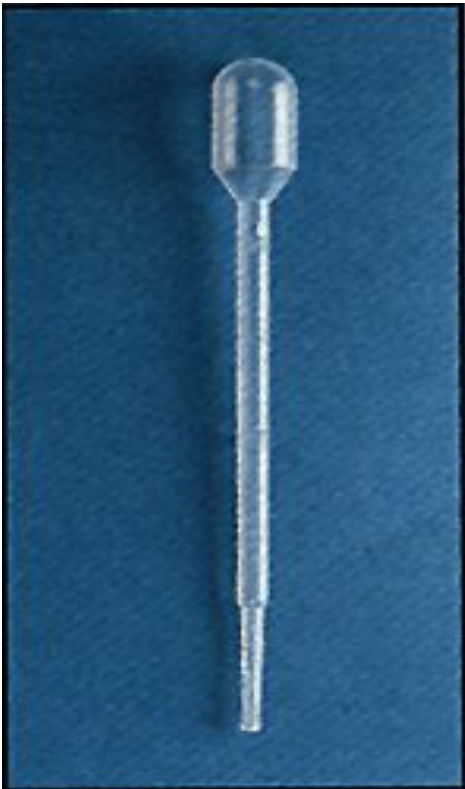


Both Pumps and Bulbs are used to fill glass pipettes



# Pasteur pipettes

Used to transfer small quantities of liquids.



Plastic Pasteur pipette  
made of single plastic  
piece.



Glass Pasteur pipettes:  
glass tubes tapered to a  
narrow point, and fitted  
with rubber bulb at the<sup>18</sup> top

# Droppers



**Ungraduated  
droppers**



**Graduated droppers**

# Wash Bottles

Formed from Polyethylene

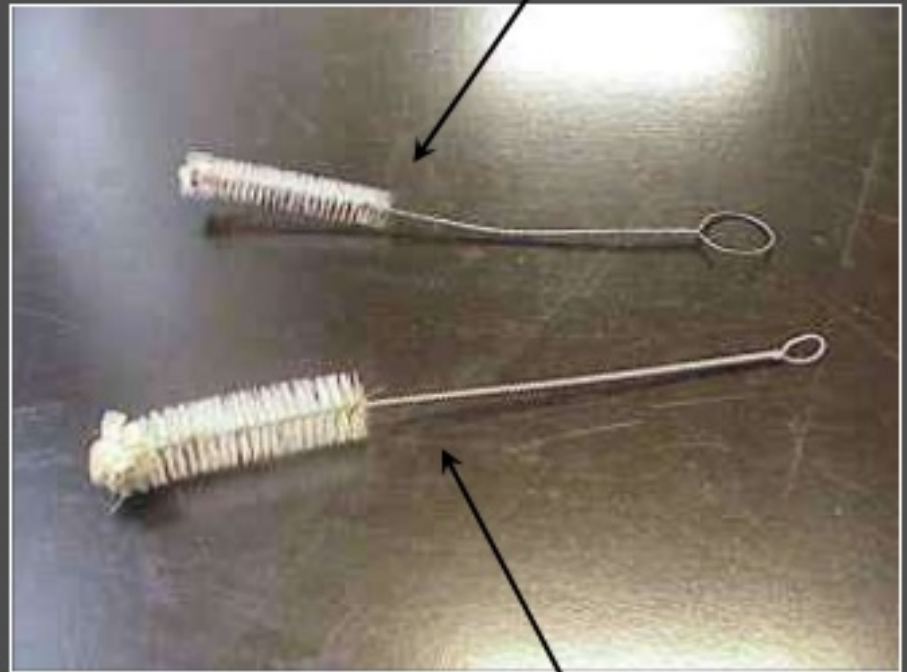


# Test Tube Brushes

Test tube brushes are used to clean test tubes and graduated cylinders.

Forcing a large brush into a small test tube will often break the tube. **Don't worry about drying the inside of a test tube.**

Small test tube brush



Large test tube brush

# Crucible Tongs

For handling hot crucibles; also used to pick up other hot objects - **NOT** to be used for picking up beakers!



## Watch Glass

A watch glass is used to hold a small amount of solid, such as the product of a reaction.

Can also be used as a **cover** for an evaporating dish or beaker.



## Crucible and cover



**Crucibles are used for heating certain solids, particularly metals, to very high temperatures. The cover can be used to contain any smoke particles.**

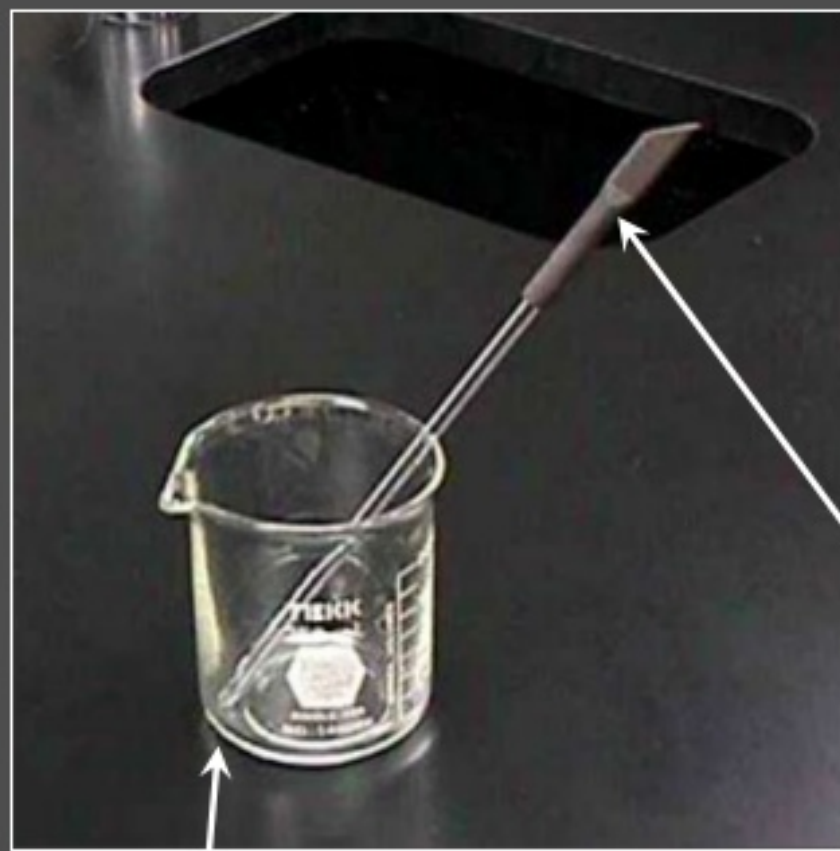


## Evaporating Dish



The evaporating dish is used for heating stable solid compounds and elements, as well as for evaporating nonvolatile solutions.

## Stirring Rod



Stir with this end.

The stirring rod is used to:

- a) manually stir solutions;
- b) assist in pouring liquids; and
- c) to transfer a single drop of a solution.

Rubber policeman tip is used to remove precipitates.

# Forceps



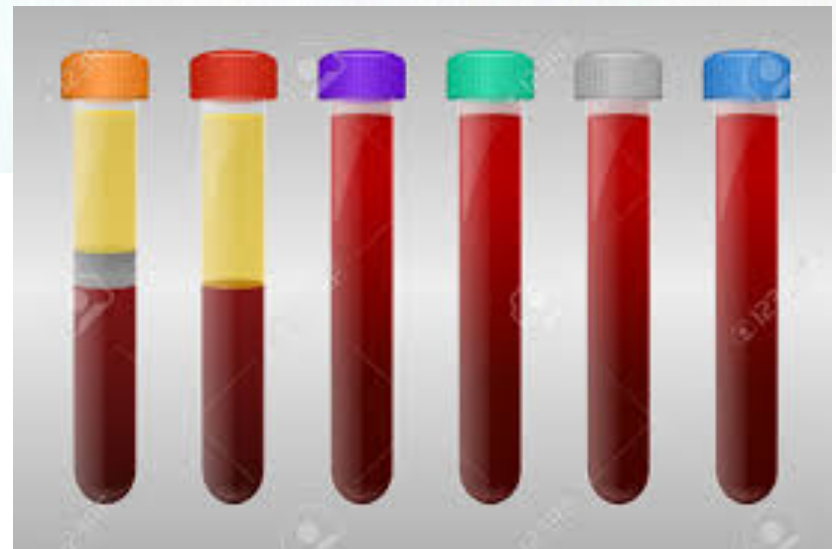
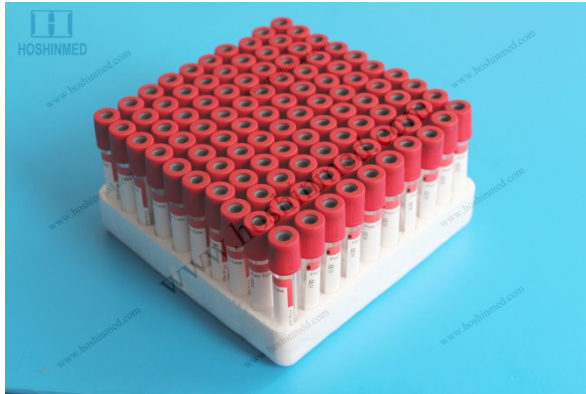
- a handheld, hinged instrument used for grasping and holding objects
- used when fingers are too large to grasp small objects or when many objects need to be held at one time while hands are used to perform a task

# Test Tube Holder



a gripping device used to carry a test tube after it has been subjected to heat and/or cold temperatures

# collection tube sample



# urine sample collection



# Clinical biochemistry analysis kits



# General Laboratory Equipments

- **Centrifuge**
- **Vortex mixer and magnetic stirrer**
- **Water bath and shaker**
- **Hot plate and Hot oven**
- **Balances**
- **Colorimeter and Spectrophotometer**

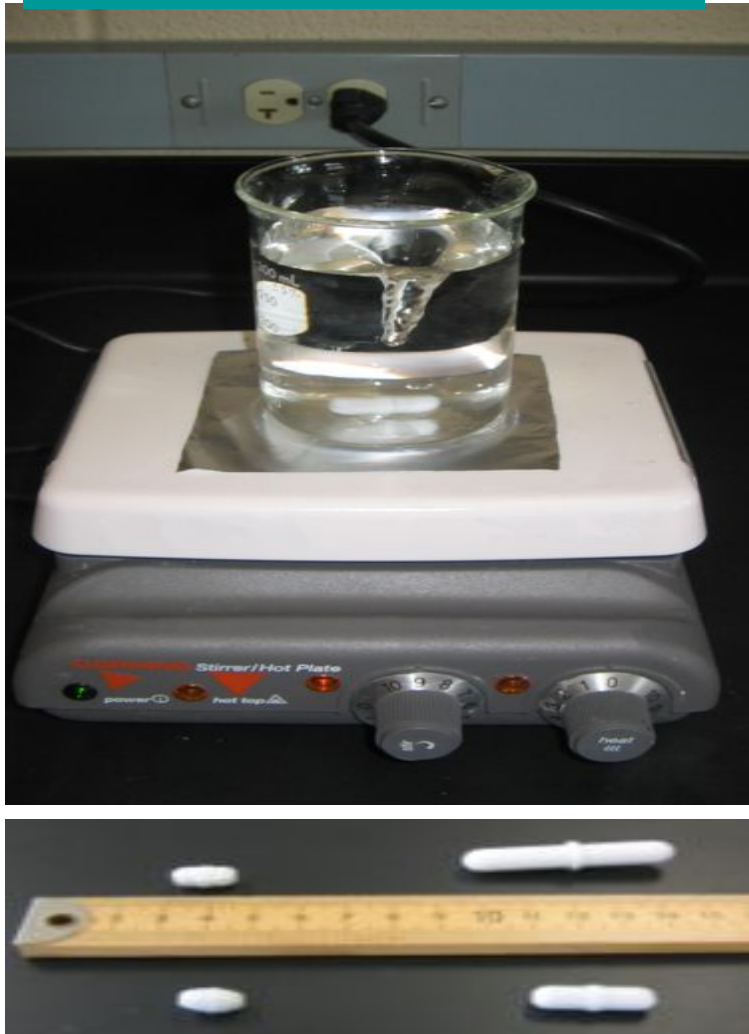


# Centrifuge

- An instrument that **accelerates gravitational separation of substances which have different masses**
- Used to:
  - 1- **Separate particles from solution in which they are suspended (e.g. separation of cells from blood to provide cell-free plasma)**
  - 2- **Separate two liquids of different densities (e.g. extracting solute from aqueous to organic solvents)**



# Magnetic stirrer with magnets



Stirrer bar: is a magnetic bar used to stir a chemical mixture or solution.

# Vortex mixer

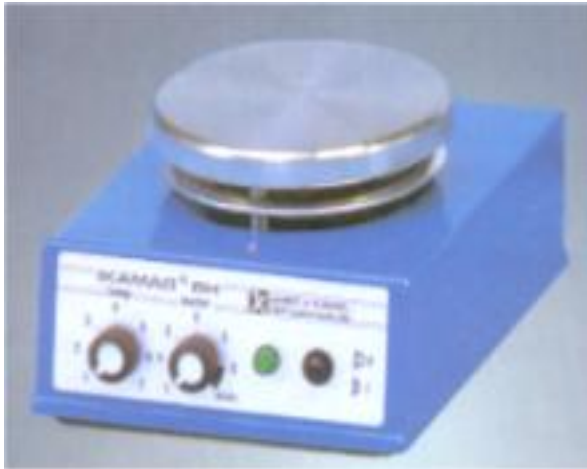


Vortex mixer for stirring and mixing of liquids in test tubes and other small vessels

# Water Bath



## Hot plate



Used for heating tasks

## Hot ovens



# Electronic Balance



# Analytical Balance



Make sure balance is **zeroed** (reads zero) before beginning. You can do this with the “zero” function.

**Never** place chemicals directly onto the balance pan. Use a weigh paper or dish.



# Bunsen Burner

Bunsen burners are used for heating nonvolatile liquids and solids.



Make sure the hose is snug on the gas outlet and that there are no cracks in the hose.

# Colorimeter/Spectrophotometer

- **Principle:**

Many important biological solutions are **estimated as colored solutions**, in which the **intensity of the color is proportional to the concentration of the biological substance**.

- Widely used in biochemistry for **quantitative** analysis of bio-molecules





# UV-Visible Spectrophotometer





**For your listening.. AGT**