

quantitative analysis

Medical Chemistry Lab.1

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Quantitative analysis is a method used to measure how much of a specific substance is present in a sample. It focuses on determining the exact amount or concentration of a chemical component using techniques like weighing and measuring volumes.

Glassware

The main characteristics of glass that used in lab is:

transparent, heat resistant, pressure and breakage resistance and chemical resistance.

The main glassware that used in lab is:



1- Cylinder:

It is used to measure the volume of liquid quickly

2- Volumetric Flask:

A volumetric flask is used when it is necessary to know both precisely and accurately the volume of the solution that is being prepared



3- Beaker:

It is a cylindrical container used to mix the reaction materials and stir them, heat them, or hold them until dry



4- Conical Flask:

The same uses of beaker and also to hold filter funnel



5- Funnel:

Used for funneling liquids from one container to another and for filtering when equipped with filter paper.



6- Filter Paper

Is a semi-permeable paper used to separate fine solids in a liquid during a filtration process.



8- Test Tube:

Used for holding small quantities of samples or for containing reactions.



9- Test Tube Holder:

Used to hold a test tube after heating or cooling.



11- Spatula:

Used for transfer small quantities of solid chemicals.



12- Pipette:

Used to transfer small quantities of liquids.



13- Thermometer:

Device used to measure the temperature of a substance.



14- Water Bath:

A vessel that contain water used to heat or maintain a constant temperature of lab materials.



15- Fume Hoods:

Used for reactions that give off vapors.



16- Centrifuge:

Used to separate or concentrate materials suspended in a liquid medium.



18- Sensitive scale:

Used to measure the mass of a solid.



How Do We Express Concentrations of Solutions?

In general chemistry is the most commonly used concentration units

- 1percentage concentration(%)
- 2Formality means the number of gram weight per letter of solution (g/L).
- 3Normality means the equivalent gram of solute per letter of solution(g/L).
- 4Molarity means the number of moles of solute per letter of solution (mol/L).
- 5Part per million (ppm)

Importance of quantitative chemical analysis

1. Industry

Determining the proportions of components in pharmaceutical, food, or chemical products

2. Environment

Measuring the concentration of pollutants in water or air

3. Medicine

Determining the concentration of drugs or toxins in the blood

Classification of Solutions

The solution can be classified according to the amount of solute

1. **Unsaturated solution**: that can dissolve more solute.
2. **Saturated solution**: A solution that cannot dissolve any more solute; extra solute will stay undissolved.
3. **Supersaturated solution**: A solution that holds more solute than it normally should, often made by heating and then cooling.

