



AL-Mustaqbal University College
Radiology Techniques Department
First Class

Practical General Chemistry
second lecture (Analytical Chemistry)



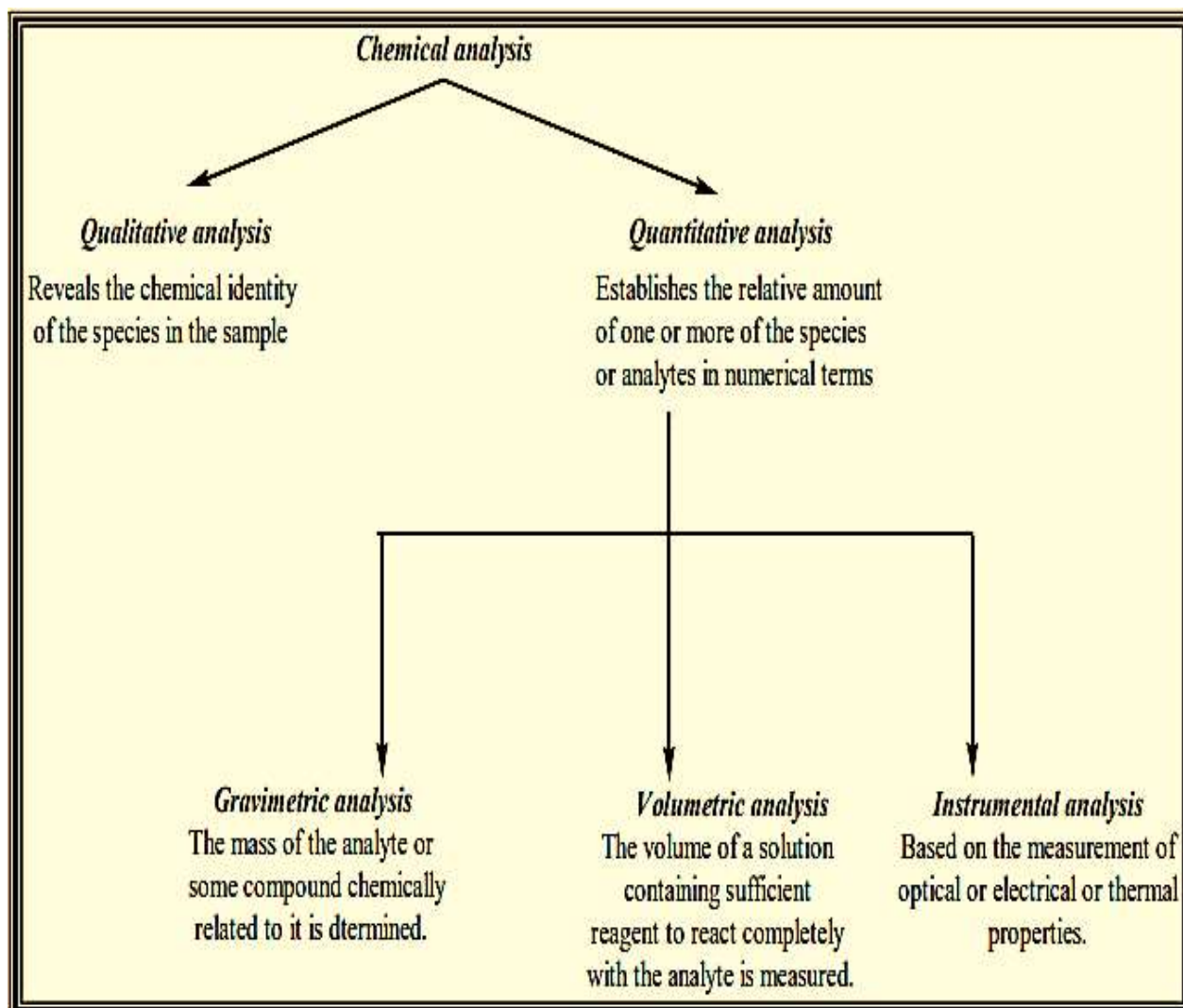
Analytical chemistry

Is the science of the characterization and measurement of chemicals and also involve separating ,identifying and determining the relative amounts of the components in a sample of matter.

Chemical analysis is divided into two types:

Quantitative analysis

Qualitative analysis .





standard solution

Is a highly purified compound that serve as a reference material in all volumetric titrimetric methods. Important requirements for a primary standard are :

- 1-High purify.
- 2-Stability toward air.
- 3-Absence of hydrate water.
- 4-Ready availability at modest cost.
- 5-Reasonable solubility in the titration medium.
- 6-Reasonable large molar mass so that the relative error associated with weighing the standard is minimized.

Prepare a standard solution

There are several ways to prepare it as follows:

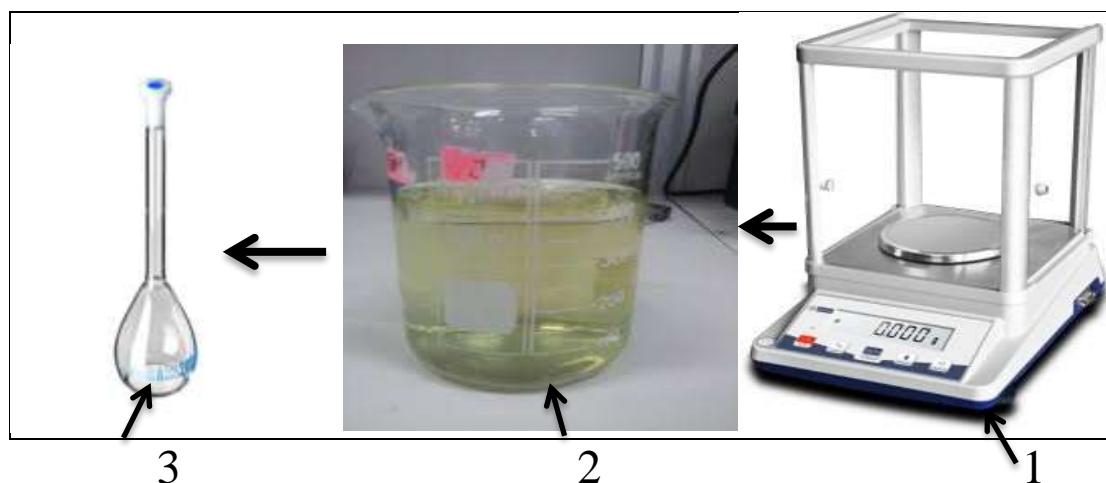
A-To prepare the weight method

The standard solution can be prepared by following the following steps:

- [1] Calculating and weighing the mass of the solute for which a solution is to be prepared.

[2] Dissolve the solute in distilled water in a beaker.

[3] Transfer the solution to a volumetric flask and add distilled water until it reaches the desired volume, then stir it.

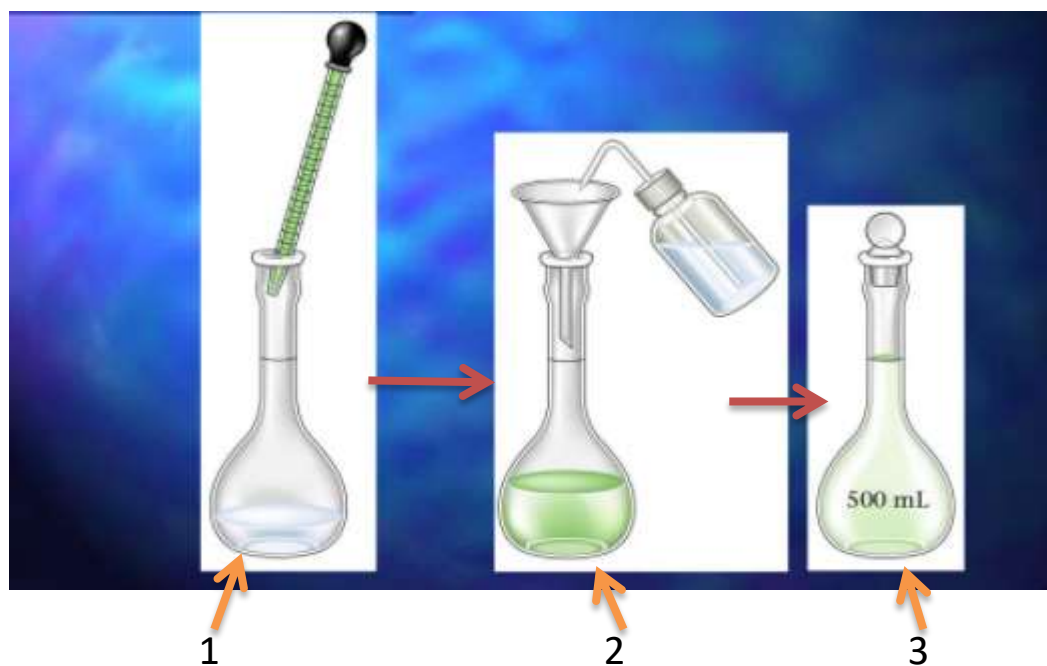


B-Dilution preparation

Dilution is to add a solvent to the solution to be diluted to prepare a less concentrated solution, by following the following steps:

[1] Using a volumetric pipette, to withdraw a specific amount of the solution and place it in a volumetric flask.

[2] Dilute the solution with a suitable solvent such as water, until it has reached the desired volume.



C-percentage solution

Is an amount or volume of chemical or compound per 100 mL of a solution. It is a relative expression of solute to solvent:

Percentage solutions are a convenient and easy way to record solution concentrations. An advantage of percentage solutions is that the molecular weight of a compound does not figure into the percentage of the required solution.

There are three types of percentage solutions commonly used:

1. Percentage weight by volume (w/v)
2. Percentage volume by volume (v/v)
3. percentage weight by weight (w/w).



Normal Solution

Normality (N) is another way to quantify solution concentration. It is similar to molarity but uses the gram-equivalent weight of a solute in its expression of solute amount in a liter (L) of solution, rather than the gram molecular weight (GMW) expressed in molarity. A 1N solution contains 1 gram-equivalent weight of solute per liter of solution.

A solution made by dissolving 1 g-equivalent weight of a substance in sufficient distilled water to make 1 L of solution

The symbol "N" is used for the titration of a solution, meaning "mol / L". The equivalent expression Eq / L is also sometimes used.

one of the main differences between the normality and molarity of a solution is that normality describes the amount of gram equivalent of compound present in the solution while molarity describes the number of moles present in the solution.