Al-Zahraa University for women
College of health and medical technologies
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The first stage

chemical analysis

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What is chemical analysis?

is a set of methods and techniques used to determine the components of a substance and their concentration.:Chei

Types of chemical analysis

1. **Qualitative Analysis**: It aims to determine the type of elements or compounds in the sample.

2. **Quantitative Analysis:** It aims to measure the exact amount of each component in the sample.

The importance of chemical analysis

- Understanding the properties of chemicals.
- Wide applications in the fields of industry, medicine, and scientific research.

Qualitative analysis

It is a set of processes in which the composition of materials, compounds or elements

Entered in the composition of a certain material or a mixture of materials is detected, whether in the solid state or in a solution in a certain solvent. This analysis does not deal at all with the quantities of these components

(HgSO4)Example: Detection of sulfates

(First method: Using mercury nitrate solution, yellow precipitate of basic mercury sulfate (Ag_2SO_4

Second method: Using silver nitrate solution, crystalline precipitate of silver sulfate

Quantitative analysis

It is the analysis that looks at estimating the quantities of components or elements included in the composition of the compound Chemical or mixture, it is clear from this that the qualitative analysis of a substance of unknown composition usually precedes

1. Gravimetric analysis

Quantitative analysis by weight is carried out by precipitating the substance and quantifying it in the form of a single element or derivative

And its weight. The weight of the substance to be estimated is calculated based on our knowledge of the precise weight and composition of the precipitate.

Methods of weight analysis

A- Direct method

In it, weight measurements are determined for the products of the analytical process whose composition is known .

B- Indirect method

Through it, measurements of lost or underweight weight are determined as a result Volatilization specie.

2. Volumetric analysis

It includes two methods:, In this case, direct and indirect methods are used to determine the weights of materials or some of their compone

A- Titration method

It includes using solutions of known concentration and measuring the volumes of such solutions that react quantitatively with a solution.

The substance to be estimated reaches a certain point called the equivalent point or the end point of the reaction

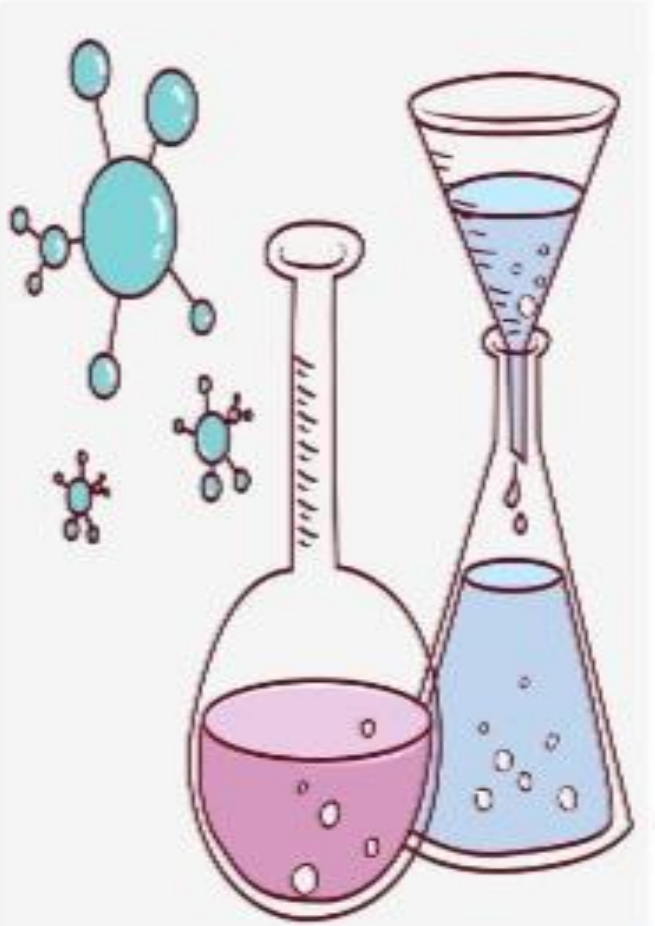
Which can be detected by indicators that include a sharp change in the properties of the solution, such as color

Or the turbidity that you notice with the naked eye

Or it is measured by physical chemical methods such as measuring potential difference or

Electrical conductivity. The solution with known concentration is called the standard solution

A solution in which a given volume contains a known weight of solute.



As for the process of adding the solution Measure from a Burette burette to a certain volume of a solution of unknown substance in a conical flask

.(titration process)Or vice versa until the reaction takes place, it is called the

B- Gas analysis

In this quantitative method, the amount of gases consumed is measured, and the substance is estimated by estimating the volume of the gas

Which may be the substance to be estimated or the result of the interaction of that substance with other substances

It gives a gas that can be estimated

Infer from the lecture what we mean by titration process?