

Chemistry : is the science concerned with composition ,structure and properties of matter as well as the changes it undergoes during chemical reactions . Important branches of chemistry Organic chemistry Inorganic chemistry Physical chemistry Biochemistry Analytical chemistry Industrial chemistry

Analytical chemistry : is a measurement science consists of a set powerful ideas and methods that are useful in all fields of science and medicine . It is a qualitative analysis and quantitative analysis .

Qualitative analysis : establishes the chemical identity of the species in the sample like (solid ,liquid,gas)

Quantitative analysis : determines the relative amounts of these species or analytes in numerical terms . Determining the identity of the analyte is adjacent to quantitative analysis

Classification of methods of analytical chemistry :

1. Gravimetric methods of analysis
2. Titrimetric methods
3. Electro-analytical methods
4. Spectroscopic methods
5. Separation methods

3 .Gravimetric methods are quantitative methods that are based on determining the mass of a pure compound to which the analyte is chemically related . Gravimetric methods of analysis are based on mass measurements made with an analytical balance Precipitation gravimetry : In precipitation gravimetry , the analyte is converted to a sparingly soluble precipitate this precipitate is then filtered , washed free of impurities ,converted to a product of known composition by suitable heat treatment

,and weighed Titrimetric methods : Titration are widely used in analytical chemistry to determine acids,base, oxidants, reductants , metal ions, proteins,and many other species .

Titrations are based on a reaction between the analyte and a standard reagent known as the titrant .the reaction is of known and reproducible stoichiometry

Applications of Analytical Chemistry :

Analytical chemistry used in many fields: · In medicine, analytical chemistry is the basis for clinical laboratory tests which help physicians diagnosis disease ·

In industry, Many household products, fuels, paints, pharmaceuticals, etc. are analysed by the procedures developed by analytical chemists before being sold to the consumer. ·

Environmental like analysis of water,analysis of air, analysis of soil and analysis of waste ·

Forensic analysis - analysis related to criminology; DNA finger printing, finger print detection; blood analysis. ·analysis of biological components (i.e., proteins, DNA, RNA, carbohydrates, metabolites, etc.).

CONCENTRATION OF SOLUTIONS Concentration : weight of the solute in certain volume of solvent or solution

1- Molarity : (The molar concentration of a solution of a solute species) is the number of moles of that species that is contained in 1 liter of the solution (not 1 L of the solvent).