Classifica" of Volumetric methods. & Analysis
Theory of Indicator and Buffers.
Titrimetric analysis & reference to acid-base, redox titra"'s.

→

Acid - Base titra" or Neutralisa" titra"
Non- Aqueous "
Precipita" "
Complexometric "
Redox "
~~Spectrometric~~ ".

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~~Acid - Base titra".~~

Analysis → Qualitative [Quality of materials]
ex- testing or measurements
→ Quantitative [Quantity of materials]
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* Theory of Indicator and buffers.
* Titrimetric analysis ᵇ reference to acid-base, redox titraⁿ's.

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2. Non- Aqueous "
3. Precipitaⁿ "
4. Complexometric "
5. Redox "
6. ~~Gravimetric~~ ".

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→ Volumetric Analysis - A method of Quantitative ~~I.V.~~ Chemical analysis in c we amount of a substance is determined by measuring the volume ~~that~~ is known as Volumetric Analysis

The method of Analysis in c we determine the qualitative and Quantitative analysis of any sample ~~is known~~ c help of standard is known as titration

~~1. Acid - Base titrations~~

| Volumetric ~~titra~~ Analysis | Titration |
|---|---|
| 1. " " is a pratical technique whereby one uses reacting volumes to analyse and calculate a variety of unknown values | 1. A " " is a practical technique used to determine the concentra$^n$ of an unknown soln. |
| 2. Determines several different unknown values regarding the analyte | 2. Determine the conc of an unknown component in a soln. |

Unit Volumetric Analysis & Gravimetric Analysis.

- Volumetric analysis is determined by volume means in litres or ML e
  ex - 1 litre, 500 mL, 250 mL etc

1. Acid - base titration.

An " " " is a method of quantitative analysis for determining the concentration of an acid or base by exactly neutralizing it c. a standard soln of base or acid having known concen tra". A pH indicator is used to monitor the progress of acid - base titration.

Strong Acid-base Acid
ex - ↑ Hydrochloric acid Sodium hydroxide

Weak Acid - base : Ethanoic acid and Sodium hydroxide

2. Non - Aqueous titra" :-
" " " refers to a type of titration in c the analyte substance is dissolved in a solvent c - does not contain water. Proton dona" c other weak acids and bases dissolved in it.

ex :- Benzene, toluene, carbon tetrachloride etc.

3. Precipitation Titration

" " is a type of technique & involves the formation of precipitate during the titration technique. when

Means ↑ two liquids are mixed are precipitated and converted into solid form.

ex - Potash Alum (Phitkari) forms when Potassium Sulphate and Aluminium Sulphate is mixed.

- When two liquid are precipitated after titration. From " compound we found out concentration. This technique is known as Precipitation Titration

4. Complexometric titration :-

" " is a form of volumetric " in the formation of a coloured complex is used to indicate the end point of titration

- The complexes are formed by the reaction of a metal ion (an acceptor, or central atom or a cation) & an anion, a neutral molecule or very rarely a true ion

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- Chelate + Metal forms a complexometric titration.
When we mix a chelate with metal and reacted to form a complex.

ex - Sample is a metal and Standard is taking as a chelate to form complex

$$MgIn + EDTA \rightarrow MgEDTA + In$$
(red) (colourless) (blue)

5. Redox Reaction :→
A " " is a titration in which the analyte and titrant react through an an oxidation - reduction reaction. One is acting as reducing Agent and other is acting as oxidising agent.

ex - Anilic acid, diphenylamine, erugreen, methylene blue and Nile blue.

$$Ce^{4+} + Fe^{2+} \rightarrow Ce^{3+} + Fe^{3+}$$

Unit – Volumetric & Gravametric Analysis

Define Volumetric titrimetry, Taitrimetry, the equivalence point, the end point.

– ~~Volumetric~~ titrimetry :-

" is an analytical techniques in ⊆ volume serves as the analytical signal.

Titration :- delivery of a measured volume of a solution of known concentra" (the titrant) into another solu" (titrand). ↓ (solu" in burette ; conc is mostly known)

solu" in flask or beaker. [conc is to be find].

Equivalence point :- the point at ⊆ enough titrant has been added to react exactly ⊆ the analyte (Stoichiometric point) [the point at ⊆ chemically equivalent quantities of reactants have been mixed]

i) Indicator- A substance that change color in response to a chemical change. [change color end point comes]

a) End point –

the " at ⊆ the indicator changes color so you can tell the equivalence point has been reached.

[ means jaha se ham formula apply karke conc pta kar sakte hai. ].

b) Stiochiometric ratio :-

mole ratio b/w the titrant and the analyte based on a balanced chemical reac" [ ]

Titrimetry :- we used

- Burette, flask or beaker, iron stand and clamp.

[- Automated titran set-up are also present]

→ Volumetric Titrimetry :-

↓

It consist of determina of volume of soln of accurately known concentra required to react completely c the soln or substance to be determined.

Terms used in volumetric analysis :-

i) Standard soln :-

" of known conc.

ii) Titrate :-

The substance being titrated.

iii) Titrant :-

Standard soln.

- the Equivalence point :

∴ means of a chemical reac$^{n}$ is the point at ⊆ chemically equivalent quantities of reactants have been mixed.

and

point of titra$^{n}$ at ⊆ the amount of titrant added is just enough to completely neutralize the analyte solution. ?

[means ↓ type of substance or a soln whose concentra$^{n}$ is needed to be found. ]

the End point : [ in back page]