1. What is titration?

Titration is a common laboratory method of quantitative chemical analysis to determine the concentration of an identified analyte.

1. Quantitative analysis and qualitative analysis?

Qualitative Analysis (identification) provides information about the identity of species or functional groups in the sample (an analyte can be identified).

Quantitative Analysis provides numerical information of analyte (quantitate the exact amount or concentration).

1. What is solution?

A solution is a special type of homogeneous mixture composed of two or more substances. In such a mixture, a solute is a substance dissolved in another substance, known as a solvent.

1. What is concentration?

The concentration of a solution is a measure of the number of particles of the solute in the solvent.

1. What is primary standard and secondary standard substances?

A primary standard is a reagent that is extremely pure, stable, has no water of hydration, and has a high fixed molecular weight.

1. What is the characteristic of primary and secondary standard substances?

A primary standard is a chemical or reagent which has certain properties such as (a) It is extremely pure, (b) Highly stable (c) It is anhydrous (d) It is less hygroscopic (e) Has very high molecular weight (f) Can be weighed easily (g) Should be ready to use and available (h) Should be preferably non-toxic (i) Should not be expensive.

1. What is indicator?

Indicators are substances whose solutions change colour due to changes in pH.

1. What is the role of starch in case of iodometric titration?

Starch turns to a dark blue in the presence of , then back to white when the is depleted, starch makes a good indicator for the endpoint of this reaction.

1. [What happens when Potassium Iodide is added in Copper solution?](http://www.answers.com/Q/What_happens_when_Potassium_Iodide_is_added_in_Copper_Chloride)
2. Why starch should have added just near the ends point?

Too early addition might block the iodine molecules in the internal structure of the alpha-starch helix. First this doesn't give good and sharp color change from blue to colorless, secondly some iodine may not react at all giving a wrong outcome. Just some drops of added titrant before end point, when the solution is turning from brown to yellow, the added starch indicator will give a full purple-blue iodine-starch-complex color (Should not be black! Still too much ).

1. How does iodine interact with starch?

When starch is reacted with iodine in aqueous phase, a colored complex of starch and iodine is formed. Most probable mechanism is believed that iodine present in form interacts with the coils of starch molecules. The starch which is aqueous soluble is beta amylose that entraps the iodine atoms in central groove of amylose coil and arranges them into a linear arrangement by mutual charge transfer between starch and iodine atoms. This atomic entrapment and charge sharing leads to changes in orientation and spacing in electrons present in the atomic orbitals, thus the resulting complex that absorbs visible light and imparts purple color.

1. Why potassium thiocyanate is added in redox iodometric titration of copper sulphate?

is precipitates in light pink color due to adsorption of and the precipitate releases very slowly. Therefore, very small amount of potassium thiocyanate is added towards the end point which helps to displace the adsorbed quickly by combining with to form which has less tendency to adsorb .

1. What is iodometry and iodimetry?

Iodimetry is directly titrated with a standard Iodine solution at the presence of a suitable indicator. The analyte under investigation needs to be the reducing agent.

Iodometry is an indirect method. In this case, the Iodine, which was produced due to a prior redox reaction, is quantified through a separate titration and the concentration of the analyte that produced the Iodine is determined.

1. What is end point?

The point on a pH titration curve at which the titration is perceived to be complete due to a colour change of an indicator.

1. What is weak acid and strong acid?

A weak acid is an acid that is partially dissociated into its ions in an aqueous solution or water. In contrast, a strong acid fully dissociates into its ions in water.

1. What is pH of solution?

The pH of a solution is a measure of the molar concentration of hydrogen ions in the solution and as such is a measure of the acidity or basicity of the solution.

1. What is pOH of the solution?

pOH is a measure of hydroxide ion (OH-) concentration.

1. What is buffer solution?

Buffers are solutions that resist a change in pH on dilution or on addition of small amounts of acids or alkali.

1. How can you calculate the pH of a buffer solution?

To calculate the specific pH of a given buffer, you need to use the Henderson-Hasselbalch equation

for acidic buffers: "pH = pKa + log10([A-]/[HA])," where Ka is the "dissociation constant" for the

weak acid, [A-] is the concentration of conjugate base and [HA] is the concentration of the weak acid.

1. What is molarity?

Molarity (M) is defined as the number of moles of solute per liter of solution.

1. What is normality?

Normality (N) is defined as the number of mole equivalents per liter of solution:

1. What is molality?

Molality (m) is defined as the number of moles of solute per kilogram of solvent.

1. Which depends temperature molarity or molality? Explain why?

Molarity depends on temperature. Molarity is the moles of solute per liter of solution. As the volume of the solution will change with temperature, so will molarity.

1. What are the different units of concentration?

Molarity – moles of solute per litre solution

Molality – moles of solute per kg solvent

Normality – grams of solute per litre solution

Formality – molecular weight of solute in grams per litre solution

Percentage – solvent/solution X 100%

1. How do you prepare a solution? Density of : , Molecular weight of : , Concentration of stock: .

i) The moles of needed

Moles of

ii) The mass of needed

Mass of

iii) The mass of solution required

iv) The volume of solution required

To prepare , dissolve of solution into of distilled .

1. How do you prepare solution from solution?
2. How do you prepare solution?
3. How do you prepare solution?

N (normality) describes a solution that contains 1-gram equivalent weight () per litre solution. An equivalent weight is equal to the molecular weight divided by the valence (here it gets a little tricky, for acids and bases it refers to the number of or .

In the case of , equivalent weight is reaction specific. When is used in acid medium as oxidiser, electrons are gained by atom. So equivalent weight of in acid medium = Molecular weight/number of electrons gained in redox reaction = . So, for solution, you have to dissolve in water.

In alkaline or neutral medium, reaction of is different and gains electrons in redox reaction. So, for alkaline medium redox titrations, equivalent weight of will be . So, for solution in alkaline medium redox titration, dissolve in water.

1. How do you prepare solution in acidic medium reaction?
2. Write down the different steps of reactions that occur when is standardized with a solution by iodometric titration.
3. Write down the different steps of reactions that occur when is estimated with a solution by iodometric titration.
4. From the reactions of , , iodine and iodide generate a relationship for the calculation of amount of present in the sample?
5. Why solution and Acetic acid is added during titration of solution?

The oxidation reaction of iodides to iodine by copper (II) ions is most effective under slightly acidic conditions, with a pH of around 4 - 5. This is the reason for the addition of acetic acid and sodium carbonate. Whenever a procedure calls for the addition of a weak acid and a weak base, there is a pretty good chance that the purpose is to form a buffer solution at some desired pH. At least in this case, that is exactly the purpose. In some case ammonia and acetic acid is used instead of sodium carbonate.

gives a blue precipitate.

The precipitate can be removed by addition of in the solution.

1. What kinds of indicators are used in case of titration of:

i) Weak acid and strong base PHENOPHTHALEIN

ii) Strong acid and weak base METHYL ORANGE

iii) Strong acid and strong base ANYTHING

iv) Weak acid and weak base CAN’T TITRATE