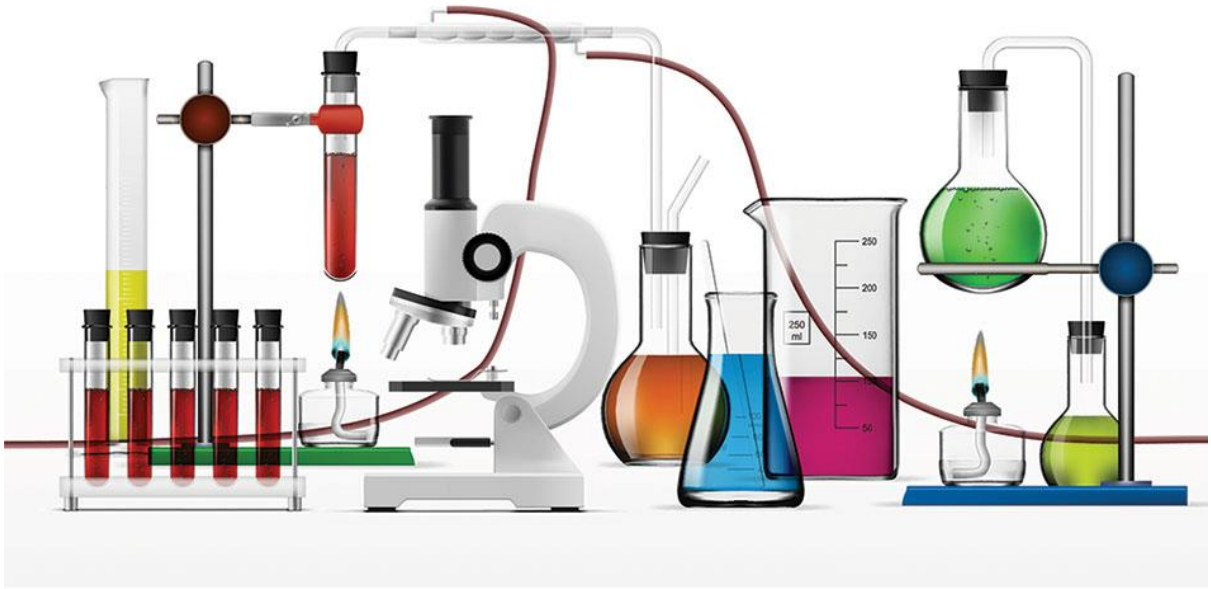
BGS SCIENCE ACADEMY & RESEARCH CENTER
Agalagurki, Chikkaballapura

B.Sc., Chemistry
Probable Viva Voce Questions and Answers
For 2, 4 and 6th Semesters



B.Sc. II Semester-Chemistry- Practicals Probable Viva Questions (From Performing Experiments only)

List of Performing experiments

1. Determination of the density using specific gravity bottle and viscosity of a liquid using Ostwald's viscometer
2. Determination of the density using specific gravity bottle and surface tension of a liquid using stalagmometer.
3. Determination of transition temperature of a salt hydrate by thermometric method.
4. Determination of distribution coefficient of benzoic acid between water and toluene.

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1. Determination of the density using specific gravity bottle and viscosity of a liquid using Ostwald's viscometer

Density: 1. Define density of a liquid.
2. Give the unit of density of a liquid in SI system.
3. In Practicals is the density determined relative or absolute? If relative, how?
4. What is specific gravity(relative density)?.{ Ans: The ratio of weight of the given liquid to the weight of equal volume of water at the same temperature}
5. How are the specific gravity and density of a liquid related?
{Ans: Density of the liquid = Sp.gravity x density at the same temperature)
6. What is the effect of temperature on the density of a liquid?
(Inversely related)
7. Two test tubes containing Benzene and water in a test tube, nitrobenzene and water in another test tube, what is your observation? why?
{In one test tube benzene is in the upper layer and water in the lower layer due to lesser density of benzene compared to water. In another test tube nitrobenzene is in the lower layer and water in the upper layer because nitrobenzene is more denser than water)
8. Name the instrument used to determine density of a liquid.

Viscosity: 1. Define viscosity of a liquid.{ Frictional drag of a liquid in its subsequent layers)
2. What is coefficient of viscosity of a liquid?{ Tangential force/unit area required to maintain unit velocity gradient between two successive liquid layers at unit distance apart)

3. Give the SI unit of coefficient viscosity. ($N.s.m^{-2}$)
4. What is the effect of temperature on viscosity of a liquid?{inversely related}
5. Name the instrument used to determine the viscosity of a liquid.
6. Why the viscometer should be dried before the measurement of viscosity of a liquid? {If not, water forms emulsion with liquid that may change the rate of flow -of the liquid}
7. Why the viscometer should be cleaned and dried using acetone.
8. How is the viscosity of a liquid related to its mobility.
9. Why do you record laboratory temperature while calculating viscosity of the liquid?
10. What is fluidity of a liquid?{ It is the reciprocal of coefficient of viscosity of a liquid. It is measure of ease with which liquid flows.}
11. Give an example for a liquid with viscosity less and more than water at a given temperature.
12. Why air bubbles should be avoided during the measurement of viscosity of a liquid? {The air bubble hinders the flow of liquid and time of flow gets affected.}
13. Write the formula to find the relative viscosity of a liquid
{ $\eta_l = [d_l t_l / d_w t_w] \times \eta_w$}
14. Name any two factors that influence the coefficient of viscosity of a liquid.
{ 1. Temperature 2.Increase in molar mass 3. Branched chain organiccompounds}
15. Which liquid among acetone and water flows fast in ground when you spill out?

2. Determination of the density using specific gravity bottle and Surface tension of a liquid using Stalagmometer

Density: 1. Define density of a liquid.
2. Give the unit of density of a liquid in SI system.
3. In Practicals is the density determined relative or absolute? If relative, how?
4. What is specific gravity(relative density)?.{ Ans: The ratio of weight of the given liquid to the weight of equal volume of water at the same temperature}
5. How are the specific gravity and density of a liquid related?
{Ans: Density of the liquid = Sp.gravity x density at the same temperature)
6. What is the effect of temperature on the density of a liquid?
(inversely related)
7. Two test tubes containing Benzene and water in a test tube, nitrobenzene and water in another test tube, what is your observation? why?
{In one test tube benzene is in the upper layer and water in the lower layer due to lesser density of benzene compared to water. In another test tube nitrobenzene is in the lower layer and water in the upper layer because nitrobenzene is more denser than water)
8. Name the instrument used to determine density of a liquid.

Surface tension

1. Define Surface tension of a liquid.{Tangential cohesive force acting along the unit length of the surface of the liquid} –
Formula used to determine ST = $v_l = [d_l\, n_w / d_w\, n_l]\, v_w$}
2. Give the SI unit for surface tension of a liquid.{N/m}
3. What are the forces of cohesion and adhesion.{The attractive force between the similar molecules-cohesion, The attractive force between the dissimilar/unlike molecules- adhesion}
4. What is the effect of temperature on the surface tension of a liquid?{ inversely related}
5. What are the factors which influences the surface tension of a liquid?{Nature of the liqud, nature of the surface in contact, temperature.}
6. The free surface of water is concave where as that of mercury is convex. Why?
{The cohesive force between the water molecules<<< adhesive force between water and glass molecules that is why concave where as in mercury the adhesive force between the mercury and glass molecules is>>>cohesive force between the mercury molecules.}

7. Why the inner surface of the stalagmometer should not oily during the measurement?
{surface tension of the liquid decreases if it is oily}
8. Give the two practical applications of surface tension of a liquid.
{1. free falling liquid drop is spherical 2. cleansing action of soaps and detergents}
9. Liquid drops are spherical in shape. Why?{ It will try to minimize the surface area so that it can have least surface tension.}
10. Which instrument is used to determine surface tension of a liquid?
11. Which method is used to determine the surface tension of a liquid?(drop number)
12. Why the rate of drop formation is to be controlled?{surface tension acting is proper}

3. Determination of transition temperature of a salt hydrate by thermometric method.

1. Define transition temperature of a salt hydrate{The temperature at which a salt of one hydrated form changes over to the other stable state either hydrated or anhydrous form}
2. What is salt hydrate.{ A crystalline salt with one or more water of hydration}
3. The transition temperature of sodium thiosulphate is 48^{o}C. What do you mean by this statement?{At 48 ^{o}C, the hydrated sodium thiosulphate and its anhydrous form are in equilibrium with each other}
4. Why the heating should be slow or low flame is used?{ In order to maintain uniformity in heating other wise the salt may melt and equilibrium is not attained}
5. What is the purpose of adding liquid paraffin to the salt in the experiment?{ To have lubrication and slow stirring should be made using a stirrer then only transition point can be attained}
6. What is the reason for selecting liquid paraffin?{ It should have high boiling point and should be inert with respect to the salt-non reacting}
7. Is outer tube necessary during the determination? Why?{Yes, because to avoid super-heating so that uniformity can be achieved}
8. At what temperature will be heating curve and cooling curve merges in the graph ?
9. Is the melting point and transition temperature of the salt are same ? substantiate.

10. The contents of the inner tube is stirred slowly. Why?{ Otherwise the temperature is not uniform and the transition temperature is not accurate}
11. Can we use 360^{o} thermometer for the determination. {No, 110^{o} thermometer should be used because of accuracy and most of the hydrated salts are having the transition temperatures less than $100^{o}C$}
12.Is the working range required for the accurate determination of transition temperature.

4. Determination of distribution coefficient of benzoic acid between water and toluene.

1. What is the principle involved in the determination of distribution coefficient of benzoic acid between water and toluene.{Nernst distribution law}
2. State Nernst distribution law.{At constant temperature, a solute distributes itself between two immiscible solvents in a definite and constant ratio}
3. Define partition coefficient or distribution coefficient.{At constant temperature the ratio of concentrations of the solute in two immiscible solvents is always constant called partition coefficient or distribution coefficient}
4. Give the limitations of distribution law.{1.Solvents should be immiscible
2. Temperature must be constant 3. The solute should be in the normal molecular form in both the solvents}
5. What is the molecular nature of benzoic acid in toluene and water?
{In toluene layer, two molecules of it gets associated where as in water layer no change}
6. Write the expression of distribution coefficient for benzoic acid distribution in toluene and water layer.{ $K_d = (C_{toluene})^{1/2}/(C_{water})$} and benzoic acid distribution in water and toluene layer. .{ $K_d = (C_{water}) /(C_{toluene})^{1/2}$}
7. What do you mean by the statement ' The distriubution coefficient of benzoic acid between toluene and water is 29 at the laboratory temperature'? { benzoic acid is 29 times more soluble in toluene layer than in water layer after the assoiciation of two molecules of it at the laboratory temperature}
8. During the experiment why titration is performed?{ to determine the concentration of benzoic acid in different layers}
9. Name the indicator used.{ Phenolphthalein}
10. Phenolphthalein indicator is used in the titration. Why?{ It is the titration between weak acid and strong base, the indicator used suits the best to get the sharp end point}

11.What is the end point of the titration? Why that colour is obtained?

{Pale pink because left over sodium hydroxide after the reaction indicates the -colour}

12. When shaken mixture of benzoic acid between toluene and water is transferred into a separating funnel, will it forms two layers or one layer. If so, which one is in the upper layer which one is in the lower layer? Why?

{Two layers, because toluene and water are immiscible with each other. Upper layer is toluene and lower one is water because water is more denser than toluene}

B.Sc. IV Semester-Chemistry- Practicals Probable Viva Questions
(From Performing Experiments only)

List of Performing experiments

Semi-micro qualitative analysis of a mixture of two simple inorganic salts and reporting of two acid and two basic radicals.

Note: Suitable combination of salts may be prepared by using the salts containing radicals (i) CO_3^{2-} ,Cl^-, Br^- ,NO_3^-,BO_3^{3-} and SO_4^{2-} (ii) Pb^{2+} ,Cu^{2+} ,Bi^{3+} ,Cd^{2+} ,Fe^{2+},Fe^{3+} ,Al^{3+} ,Mn^{2+}, Zn^{2+}, Ba^{2+} , Sr^{2+} ,Ca^{2+}, Mg^{2+}, NH_4^+,K^+

1. What is a group reagent?{ The reagent that reacts with the radical of the salt indicating some changes like precipitate/gas evolution etc.}
2. Name the type of bonding between radicals in an inorganic salt.
3. What is an acid radical?
4. What is a basic radical?
5. Give an example for a non-metallic basic radical.{Ammonium }
6. Write the acid radical and basic radical in aluminium sulphate and Magnesium chloride salt mixture indicating the charges.
7. Name the gas liberated when a carbonate salt is treated with dil.HCl acid.
8. Lime water turns milky during the presence test of carbonate/bicarbonate test. Give the chemical composition of milky appearance.
9. Lime water does not turn milky when a solution of carbonate salt is heated followed by passing through it. Why?{Carbonates are stable in aqueous medium does not liberate carbon dioxide}
10. What is the chemical composition of lime water?{$Ca(OH)_2$}
11. Which gas is liberated when a chloride salt is treated with con.sulphuric acid?(HCl)
12. Which gas is liberated when a bromide salt is treated with con.sulphuric acid?(Br_2)
13. Give the composition of white fumes liberated when a glass rod dipped in ammonium hydroxide is exposed to the gas coming out of the test tube containing a chloride salt and con.sulphuric acid.
14. Name the test used to confirm a chloride radical.(Chromyl chloride)
15. What is the chemical composition of reddish brown vapours in Chromyl chloride test. (CrO_2Cl_2).
16. At the end a yellow precipitate is formed in Chromyl chloride test. Give its formula. ($PbCrO_4$)
17. Name the gas liberated when a nitrate salt is heated with II group reagent.{NO_2}

18. Which compound is formed in brown ring test.{nitroso ferrous sulphate: $FeSO_4.NO$}

19. Name the confirmatory test for bromide radical.{globule test}. What is the principle involved in that test.{ Displacement reaction, chlorine displaces bromine from bromide salt that dissolves in CCl_4 producing orange globule}
20. Which chemical used as a group reagent to identify III group acid radicals.{No group reagent}
21. Green edged flame is obtained when the out coming vapours of a borate salt is heated with an alcohol and con.sulphuric acid. Which is that compound.{ ethyl borate}
22. Give the chemical formula of the compound formed in confirming a sulphate radical.
{ $BaSO_4$} why is it insoluble in excess of dil.HCl.{Its solubility product is less}
23. What is an original solution?
24. What is the chemical formula of golden yellow spangles{PbI_2}
25. Give the formula of white precipitate obtained when a solution containing lead radical is treated with I group reagent. {$PbCl_2$}
26. ** Composition of the precipitates obtained when the group reagents of the respective groups are treated with the their group reagents

Pb^{2+}	$PbCl_2$	White
Bi^{3+}	Bi_2S_3	Brown
Cu^{2+}	CuS	Black
Cd^{2+}	CdS	Yellow
Fe^{2+}	$Fe(OH)_2$	Green
Fe^{3+}	$Fe(OH)_3$	Red. Brown
Al^{3+}	$Al(OH)_3$	Gel.white
Zn^{2+}	ZnS	White
Mn^{2+}	MnS	Buff
Ba^{2+}	$Ba\ CO_3$	White
Sr^{2+}	$Sr\ CO_3$	White
Ca^{2+}	$Ca\ CO_3$	White

27. IV group basic radicals will not be precipitated when the original solution is treated with hydrogen sulphide gas.Why{ Ionic products of II group metallic sulphides exceeds than that of IV group sulphides in acidic medium}
28. Can thioacetamide be used instead of hydrogen sulphide gas in II and IV group basic radical detection.{ Yes, Treatment of aqueous solutions of many metal cations to a solution of thioacetamide affords the corresponding metal sulfide or source of sulphide ions as follows:

$CH_3C(S)NH_2 + H_2O \rightarrow S^{2-} + CH_3C(O)NH_2 + 2\ H^+$ }

29. Give the confirmatory test for bismuth ion.{ Salt solution is treated with dil. HCl and KI to get dark chocolate coloured precipitate.}

30. What happens when cupric salt is teated with excess of ammonium hydroxide?{It forms deep blue coloured solution- cuprammonium sulphate}

31. Cadmium salt gets precipitated when sulphide ions are reacted only in dilution. Why?

{ Its solubility product decreases in slightly basic medium that favours precipitation}

32. Which ion is responsible for precipitating III group basic radicals?

{ OH^- ion}

33. Though OH^- ion required for precipitation of III group basic radicals, what is the reason for the addition of ammonium chloride to the original solution.

{The concentration of OH^- requirement should be less inorder to exceed their ionic products,so that addition of ammonium chloride creates common ion effect and decreases OH^- ions}

34. What is meant by centrifuging?

35. Which ions are present in centrifugate, original solution, and residue.{Original solution mixture of two basic radicals or cations, residue: the cation or basic radical of the identified group, centrifugate: the cation or basic radical of further groups}

36. Gelatinous white precipitate of aluminium hydroxide dissolves in excess of sodium hydroxide solution.Why?{ aluminium hydroxide dissolves in excess of sodium hydroxide solution due to the formation of sodium aluminate- $NaAlO_2$ - a complex solution}

37. A salt mixture has aluminium and zinc radicals, how do you eliminate aluminium during analysis?{ By centrifuging aluminium hydroxide precipitate, the centrifugate contains only zinc ions}

38. A salt solution on treatment with group reagent gives flesh colored precipitate. Identifythe precipitate.{Manganous sulphide}

39. Name the chemical and its formula of the pink coloured supernatant liquid obtained in4th group basic radical analysis.{Permanganic acid. $HMnO_4$}

40. What is the role of sodium hydroxide in detecting zinc and manganese ions.

{On treating the precipitate of 4th group with excess of sodium hydroxide solution, if it dissolves, it is zinc because of the formation of sodium zincate-complex solution, if it is insoluble and colour changes to buff it is manganese, since it is insoluble.}

41. Give a confirmatory test for zinc radical, what is its formula.{Salt solution gives a white precipitate with potassium ferrocyanide solution.- $Zn_2[Fe(CN)_6]$}

42. Give the sequence of radicals in 5th group basic radicals and mention the colours imparted when they are subjected to flame test.{Ba^{2+} – apple green colour, Ca^{2+}-brick red colour, Sr^{2+} - crimson red colour}

43. Which anion in the group reagent of 5th basic radicals is mainly responsible to get the precipitates of basic radicals of that group.{ Carbonate – CO_3^{2-}}

44. Name the product of reaction between calcium salt and ammonium oxalate solution.

45. What is the chemical composition of the product by the reaction between barium radical and potassium chromate solution in weak acid medium.{Barium chromate-$BaCrO_4$-a yellow ppt.}

46. What is Nessler's reagent?{Potassium mercuric iodide- $K_2[HgI_4]$}

47. What happens when ammonium salt solution is treated with Nessler's reagent.

48. Name the gas evolved when ammonium chloride is boiled with sodium hydroxide solution. What is its action on moist litmus paper?

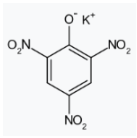
49. How do you identify a magnesium salt in a given mixture. Explain?{The salt solution gives a white precipitate with ammonium chloride, ammonium hydroxide and ammonium hydrogen phosphate. The precipitate has the composition- $MgNH_4PO_4$}

50. Will there be any difference in identifying the radicals in VI group basic radicals, if so how?{Yes, Magnesium and ammonium are identified in basic medium whereas sodium and potassium are identified in slightly acidic medium}

51. Which test is performed to identify potassium radical and sodium radical?

{Potassium radical- Picric acid test. Sodium radical- potassium pyroantimonate test}

52. Mention the colours and formula of the precipitates of potassium picrate and sodium pyro antimonate.{ Potassium picrate- yellow crystalline ppt,- Sodium pyroantimonate-white precipitate- $Na_4Sb_2O_7$}



53. You have identified in the given salt barium, ammonium as basic radicals and chloride and carbonate as acid radicals. Represent symbolically.

54. You have identified in the given salt aluminum, sodium as basic radicals and nitrate and sulphate as acid radicals. Write the possible formulas of the salt.

{$Al_2(SO_4)_3 + NaNO_3$, $Na_2SO_4 + Al(NO_3)_3$}

55. Represent the following radicals ionically. phosphate, borate, bismuth, cadmium.

{ PO_4^{3-}, BO_3^{3-}, Bi^{3+}, Cd^{2+}}

B.Sc. VI Semester-Chemistry-Practical-VII-Inorganic Chemistry Practicals
Probable Viva Questions(From Performing Experiments only)
List of Performing Experiments
(Any one of the following experiments shall be set Volumetric analysis)

1. Estimation of iron in haematite (using diphenyl amine as internal indicator) using Ferrous ammonium sulphate crystals and (reduction by $SnCl_2$) Potassium dichromate or ceric ammonium sulphate solution.
2. Estimation of Zinc using Zinc sulphate crystals and EDTA
3. Estimation of Nickel, Zinc sulphate crystals and EDTA
4. Estimation of Calcium in lime stone using Sodium oxalate crystals and Potassium permanganate solution.
5. Estimation of copper in brass using potassium dichromate crystals and Sodium thiosulphate solution.

Gravimetric analysis: 1. Estimation of Nickel as nickel dimethyl glyoximate

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1. Estimation of iron in haematite (using diphenyl amine as internal indicator) using Ferrous ammonium sulphate crystals and (reduction by $SnCl_2$) Potassium dichromate or ceric ammonium sulphate solution.

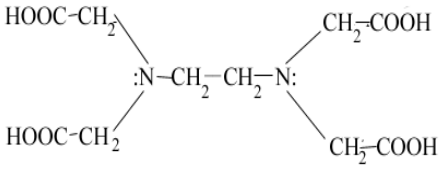
1. Define a standard solution.
2. How a standard solution is prepared.
3. Define normality and molarity of a solution.{ Normality: It is the number of gram equivalent ents of the solute present in one dm^3 of its solution. Molarity : It is the number of gram molecular weight of the solute present in one dm^3 of its solution}
4. 0.1Normal solution of ferrous ammonium sulphate is supplied to you in 100 ml standard flask. How many grams of FAS is present in it.(Mol.mass=392)
5. Give the composition of haematite ore.{Fe_2O_3}
6. Which acid is added to dissolve haematite ore?
7. What is the role of stannous chloride during the estimation of haematite ore.{reducing agent}
8. Name the indicator used in iron estimation.{ Diphenyl benzidine as the internal indicator}
9. What is the end point.{ Green to violet}
10. Iron in which oxidation state present in haematite ore.
{ Fe in ferric state-Fe^{3+}}

11. Name the type of reaction and nature of the reactants in this titration.{Red-ox titration,\ Potassium dichromate is the oxidizing agent, Fe^{2+} is the reducing agent.
12. At the end point name the ions present in the titration.{ Fe^{3+}, Cr^{3+}}
13. What is the role of adding acid mixtrure in this titration?{To maintain the pH in acidic medium that is in pH 4}
14. Why dil. sulphuric acid is added during the titration?
15. Why mercuric chloride is added in the titration?{ to remove excess of stannous chloride}

2. Estimation of Zinc using Zinc sulphate crystals EDTA solution and Eriochrome Black-T indicator

1. Define a standard solution.
2. How a standard solution is prepared.
3. Define normality and molarity of a solution.{ Normality: It is the number of gram equivalents of the solute present in one dm^3 of its solution. Molarity: : It is the number of gram mole cular weight of the solute present in one dm^3 of its solution}
4. While preparing standard zinc sulphate solution little amount of dil.sulphuric acid is added. Why?{ To dissolve white precipitate of zinc hydroxide formed if any}
5. Name the indicator used in the titration.{ Eriochrome Black-T)
6. What is the end point of the titration? Why?{ Wine red to blue, In wine red colour, the solution contains only Zn^{2+}, at the end point there is no zinc ions only zinc EDTA complexis present that gives blue colour in basic medium with the indicator}
7. Why ammonia ammonium chloride buffer is added in the titration?{ To maintain the pH of the solution in basic medium pH8 where the indicator is sensitive to denote the end point of the titration and also favours the complex formation}
8. What is EDTA.{ It is ethylene diamine tetra acetic acid, which is a hexadentate ligand}
9. Which type of titration does it belong?{ complexometric titrations where zinc is forming a complex with EDTA}
10. While preparing EDTA solution, sodium salt of EDTA is used. Why?{ Since it is more soluble in water than EDTA alone}
11. Which compound is primary standard in the titration.{ $ZnSO_4.7H_2O$}
12. What is a primary standard solution?{ A solution whose concentration remains same for a longer period of time}

13. What is a secondary standard solution?{ A solution whose concentration changes when it is preserved for longer period of time}
14. Write the structure of EDTA.



structure of EDTA

15. How do you prepare 0.025M zinc sulphate solution.(Mol. wt = 287.5)
{ Mass = 0.025x287.5/4= 1.8 g $ZnSO_4.7H_2O$ crystals are weighed and dissolved in 250 ml of distilled water with little dil.sulphuric acid}
16. How many zinc ions are involved in ZnEDTA complex?{2}
17. What is Eriochrome Black-T{ It is an azo dye used as an internal indictor in complexometric titrations}
18. What is the colour of the indicator? {In its protonated form, Eriochrome Black T is blue}

3. Estimation of Nickel using Zinc sulphate crystals EDTA solution and Eriochrome Black-T indicator

1. Define a standard solution.
2. How a standard solution is prepared.
3. Define normality and molarity of a solution.{ Normality: It is the number of gram equivalents of the solute present in one dm^3 of its solution. Molarity: : It is the number of gram mole cular weight of the solute present in one dm^3 of its solution}
4. While preparing standard zinc sulphate solution little amount of dil.sulphuric acid is added. Why?{ To dissolve white precipitate of zinc hydroxide formed if any}
5. Name the indicator used in the titration.{ Eriochrome Black-T)
6. Why Nickel is estimated by back titration method?{ because nickel reacts in acidic medium, it is estimated indirectly using zinc solution}.
7. What is the end point in estimation of nickel using zinc sulphate solution?
{blue to wine red}
8. How EDTA is standardized in the titration.

4. Estimation of Calcium in lime stone using Sodiumoxalate crystals and Potassium permanganate solution.

1. Define a standard solution.
2. How a standard solution is prepared.
3. Define normality and molarity of a solution.{ Normality: It is the number of gram equivalents of the solute present in one dm^3 of its solution. Molarity: : It is the number of gram
   mole cular weight of the solute present in one dm^3 of its solution}
4. What is a primary standard solution?{ A solution whose concentration remains same for a longer period of time}
5. What is a secondary standard solution?{ A solution whose concentration changes when it is preserved for longer period of time}
6. What is lime stone? { It is an alloy of calcium having the composition $CaCO_3$}.
7. How do you prepare alloy solution for estimation? { by dissolving the lime stone in dil.HCl}
8. How potassium permanganate is standardized in the titration.
9. Name the indicator used in the titration.
10. What is the end point?
11. Name the reducing agent and oxidizing agent in the titration. { Oxalic acid reducing agent and potassium permanganate is the oxidizing agent in acid medium}
12. Is potassium permanganate a primary standard? explain.{ No, it is light sensitive its concentration changes with time}
13. Why potassium permanganate is stored and used in brown bottles?{ it is light sensitive its concentration changes with time when it is stored in white bottles.}

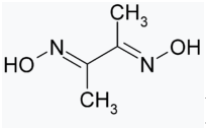
5. Estimation of copper in brass using potassium dichromate crystals and Sodium thiosulphate solution.

1. Define a standard solution.
2. How a standard solution is prepared.
3. Define normality and molarity of a solution.{ Normality: It is the number of gram equivalents of the solute present in one dm^3 of its solution. Molarity: : It is the number of gram mole cular weight of the solute present in one dm^3 of its solution}
4. What is a primary standard solution?{ A solution whose concentration remains same for a longer period of time}

5. What is a secondary standard solution?{ A solution whose concentration changes when it is preserved for longer period of time}
6. What is Brass? { It is an alloy of Zn and Cu }.
7. How do you prepare alloy solution for estimation?{by dissolving the brass alloy in con.HNO_3}
8. Indicate the standardization part and estimation part in this experiment.
{ Standardization part is standardizing sodium thiosulphate solution using pot. dichro mate solution. Estimation part is estimation of copper using standardized hypo solution}
9. What is hypo?{sodium thiosulphate solution}
10. What is the point and indicator in the titration.{ Disappearence of blue colour, freshly prepared starch solution}

6. Gravimetric analysis: Estimation of Nickel as nickel dimethyl glyoxime

1. What is gravimetric analysis?{ **Gravimetric analysis** is a technique through which the amount of an analyte (the ion being **analyzed**) can be determined through the measurement of mass}
2. Which is the analyte in the Ni DMG estimation?{Nickel}
3. Name the precipitate obtained when nickel is treated with alcoholic DMG solution is basic medium.{Nickel dimethyl glyoxime}
4. Which is the ligand in this experiment.{ dimethyl glyoxime}
5. Write the structure of DMG .{ Structure:



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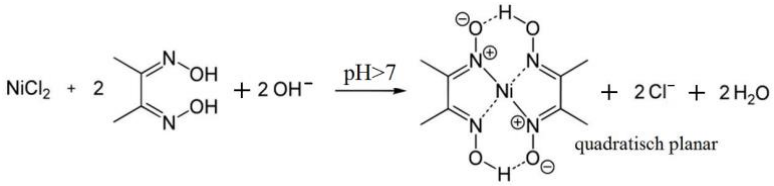
6. Write the structure of NiDMG complex.



B.Sc. VI Semester-Chemistry-Practical-VIII-Biochemistry Practicals
Probable Viva Questions(From Performing Experiments only)
List of Performing Experiments
(Any one of the following experiments shall be set)

Colorimetric estimation

1. Estimation of reducing sugar by dinitrosalicylate (DNS) Method
2. Estimation of inorganic phosphate by the modified Fiske –Subbarow method
3. Estimation of creatinine in urine(or given sample) by Jaffe' s method

Titrimetric estimation

1. Estimation of reducing sugar by Hagedorn - Jensen's method
2. Estimation of reducing sugar by Somogy's method

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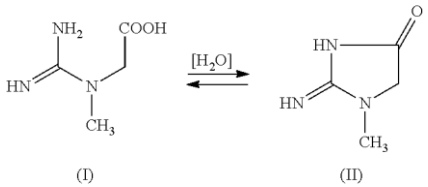
1. Colorimetric Estimation of creatinine in urine(or given sample) by Jaffe' s method

1. What is colorimetry? {colorimetry or colourimetry is a technique "used to determine the concentration of colored compounds in solution}
2. What is a colorimeter? {A colorimeter is a device used to test the concentration of a solution by measuring its absorbance of a specific wavelength of light}
3. What is creatinine?{It is a nitrogenous organic compound in urine produced by protein metabolism}
4. Is Creatine and Creatinine are same, if different how?{No, Creatine is a nitrogenous organic acid that occurs naturally in vertebrates. Its main role is to facilitate recycling of adenosine tri- phosphate (ATP), the energy currency of the cell, primarily in muscle and brain tissue. Creatine is in equilibrium with creatinine.



(I) (II)

Creatine Creatinine

5. Which method is used in the estimation of creatinine present in urine or an unknown solution?{Jaffe's method}
6. What is the pathological condition of elevated level of excretion of creatinine?{ Fever and wasting disease(normal range is 1 to 1.8 g in 24 hour urine}
7. What is the difference between working solution and estimated solution?{Working solution is 50 microgram/ml- to get the known standarad graph, whereas the estimated solution is the unknown supplied in standard flask}

8. What is the concentration of working standard solution used in Jaffe's method {2µg/ml)
9. Name the reagent used in Jaffe's method to get the colour and in which medium it is performed.{Picric acid, in alkaline medium the colour is obtained, the colour is red}
10. What is picric acid.{2,4,6 trinitro phenol}
11. At What absorbance creatinine is estimated in this method?{540nm)
12. What is the principle used in colorimetric estimations? { Beer Lambert's law}
13. State Beer Lambert's law.{ The absorbance of the light is directly proportional to the thickness of the solution of definite concentration}
14. What is a standard graph? { A graph representing the variation of absorbance vs concentration for known solution concentrations)
15. What is the role of filters in a colorimeter?{ It allows the passage of light of a very narrow range of wavelength}
16. What is the role of Creatinine in the human body?{ Creatinine is produced from creatine, a molecule of major importance for energy production in muscles. Approximately 2% of the body's creatine is converted to creatinine every day. Creatinine is transported through thebloodstream to the kidneys. The kidneys filter out most of the creatinine and dispose of it inthe urine}
17. What is the principle involved in Jaffe's method?{The method is based on the Jaffe reaction.Creatinine reacts with picrate ion formed in alkaline medium to develop a red-orange colour.The colour produced from the sample is then compared in a colorimeter at wavelength of 540 nm with that produced by a known amount of creatinine under the same condition.}
18. The unknown solution of creatinine contains 40micrograms in 0.2 ml of the solution. What is its concentration?{2microgram/ml}
19. How much volume of the unknown is used from made up solution.{1ml}
20. What is meant blank value in colorimetric estimations.{ All reagents except creatinine}

2. Colorimetric Estimation of inorganic phosphate by the modified Fiske –Subbarow method

1. What is the principle used in Colorimetric Estimation of inorganic phosphate by the Fiske –Subbarow method{ Inorganic phosphate reacts with molybdic acid to form phospho molybdic acid. The reducing agent selectively reduces this to deep blue coloured lower oxides of molybdenum. The colour is read at 660 nm using a suitable blank}
2. What is meant by micro molar solution?{ A solution containing microgram mol.mass dissolved in 1litre of its solution}
3. The molar mass of potassium dihydrogen phthalate is 136. How do you prepare 1micro molar solution in 1 litre of water?{By dissolving 136mg of it in 1 litre of its solution}
4. Which colour is develed in this method.{ Deep blue}
5. Give the wavelength of absorbance used in F. Subbarao method.{660nm}
6. What is colorimetry? {colorimetry or colourimetry is a technique "used to determine the concentration of colored compounds in solution}
7. What is a colorimeter? {A colorimeter is a device used to test the concentration of a solution by measuring its absorbance of a specific wavelength of light}
8. What is the principle used in colorimetric estimations? { Beer Lambert's law}
9. State Beer Lambert's law.{ The absorbance of the light is directly proportional to the thickness of the solution of definite concentration}
10. What is a standard graph? { A graph representing the variation of absorbance vs concentration for known solution concentrations)
11. What is the role of filters in a colorimeter?{ It allows the passage of light of a very narrow range of wavelength}
12. What is meant by protocol in biochemistry estimations{ Precise way of procedure of experiment in the type of tabular columns}

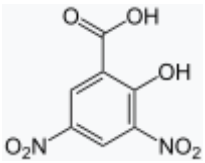
3. Colorimetric Estimation of reducing sugar by Dinitrosalicylate (DNS) Method

1. What is the principle involved in the colorimetric estimation of glucose by DNS method?

{ An alkaline solution of 3,5 dinitro salicylic acid(DNS) oxidizes a reducing sugar in hot condition and a red color is obtained since the acid is reduced by the sugar which is measured using a colorimeter}

2. What is DNS?{ 3,5 dinitro salicylic acid(DNS)}

3. Write the structure of DNS.



4. What is the role of reducing sugar on DNS reagent?{It reduces to 3 amino 5 nitro salicylic acid that is one nitro group is reduced to amino group}

5. What is the colour obtained when DNS is reduced by glucose?{ Red}

6. Give the concentration of working solution of glucose in this method.{1.8mg/ml}

7. What wave length is suitable to read the colour in this method.{540nm}

8. Is heating required in this method of estimation? { Yes, since reaction is slow}

9. How glucose is a reducing sugar?{Since it contains aldehyde group}

10. What is colorimetry? {colorimetry or colourimetry is a technique "used to determine the concentration of colored compounds in solution}

11. What is a colorimeter? {A colorimeter is a device used to test the concentration of a solution by measuring its absorbance of a specific wavelength of light}

12. What is the principle used in colorimetric estimations? { Beer Lambert's law}

13. State Beer Lambert's law.{ The absorbance of the light is directly proportional to the thickness of the solution of definite concentration}

14. What is a standard graph? { A graph representing the variation of absorbance vs concentration for known solution concentrations)

15. What is the role of filters in a colorimeter?{ It allows the passage of light of a very narrow range of wavelength}

16. What is meant by protocol in biochemistry estimations{ Precise way of procedure of experiment in the type of tabular columns}

4. Titrimetric estimation of reducing sugar by Somogy's method

1. What are reducing sugars? give an example.{The sugars which reduces Tollen's reagent or Fehling's solution.}
2. Which ion is reduced in Somogy's method?{ Cupric ions}
3. Name the standard solution taken in the burette in titrimetric estimations.{Hypo or sodium thiosulphate solution}
4. What is the normality of hypo solution in Somogy's method?{N/200}
5. Which indicator is used in titrimetric estimation of reducing sugars.{freshly prepared starch solution}
6. What is meant by blank titration? Mention its importance.{A titration is carried out without the test sample like glucose but with all the necessary reagents}
7. What is the meaning of (B-T) value?{ It gives the value of iodine liberated which is proportional to the mass of glucose present}
8. What happens to cupric ions of copper reagent in Somogy's method?{Cupric ions are oxidized to cuprous ions}
9. Name the chemical present in copper reagent that prevents the oxidation of cuprous oxide by atmospheric oxygen. ?{sodium sulphite}
10. What is the end point of the titration.{blue to colourless}
11. Why starch is used only at the end of the titration?{To get the sharp end point and to estimate the remaining traces of iodine.}
12. What is the principle involved in Somogy's method?{Reducing sugars selectively reduce cupric salt to cuprous oxide. These ions are oxidized by potassium iodide and potassium iodate to liberate iodine. Excess of iodine is titrated by using std.hypo with starch indicator}
13. What is the difference between iodometry and iodimetry.{In iodometry iodine liberated is estimated where as in iodimetry iodine is taken directly and estimated}
14. Old samples of starch is not used. Why?{ In that starch is not present it gets hydrolysed}

5. Titrimetric estimation of reducing sugar by Hegdorn Jensen's method

1. What are reducing sugars? give an example.{The sugars which reduces Tollen's reagent or Fehling's solution.}
2. Which indicator is used in titrimetric estimation of reducing sugars.{freshly prepared starch solution}
3. What is the meaning of (B-T) value?{ It gives the value of iodine liberated which is proportional to the mass of glucose present}
4. What happens to reducing sugars in presence of alk.potassium ferricyanide reagent in HJ method.{They are oxidized}
5. What is the normality of hypo solution used in HJ method?{N/40}
6. Give the principle involved in HJ method.{ Reducing sugars are oxidized by alk.potassiumferricyanide. The potassium ferricyanide remaining liberate iodine on heating KI in acid medium. The liberated iodine is titrated against standard N/40 hypo solution using a blank solution}
7. In HJ method, how the reverse reaction of reduction of potassium ferri-cyanide can be prevented?{ by the precipitation of ferrocyanide as a zinc salt}
8. What is the concentration of standard glucose in HJ method?{1mg.ml}
9. What is the colour change at the end point in this titration{blue to white precipitate}
10. Write the reaction of liberation of iodine in HJ method.

{ $2K_3Fe(CN)_6 + 2KI \rightarrow 2K_4Fe(CN)_6 + I_2$}