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Arts, Commerce and Science college Bodwad Dist-Jalgaon

Questions Bank

Class- S.Y.B.Sc

Sem- IV

Subject- Chemistry.

Paper name- Advanced analytical chemistry

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1. Metal ions react with ligand to form \_\_\_\_\_ compound.  
a) Ionic  
**b) Co-ordinate complex**  
c) Covalent  
d) Multiple bond
2. Ethylenediamine is capable of forming \_\_\_\_\_ Co-ordinate bond.  
a) 1      **b) 2**      c) 4      d) 8
3. EDTA is capable of forming \_\_\_\_\_ co-ordinate bond  
a) 1      b) 2      c) 4      **d) 6**
4. EDTA is number of nitrogen and oxygen atoms acting as donor are \_\_\_\_\_  
a) 3 and 2    b) 2 and 3    **c) 2 and 4**    d) 4 and 2
5. In complexometric titration EDTA is used as \_\_\_\_\_  
a) titrate    **b) titrant**    c) analyte    d) indicator
6. EDTA is \_\_\_\_\_ acid.  
a) Diprotic    b) monoprotic    c) triprotic    **d) tetraprotic**
7. Protonated form of Erichrome black T is  
a) Red    b) Black    **c) Blue**    d) yellow
8. Total hardness of water is due to the amount of

a)  $\text{Ca}^{+2}$     b)  $\text{Mg}^{+2}$     c)  $\text{Cl}^-$     **d) )  $\text{Ca}^{+2}$  and  $\text{Mg}^{+2}$**

9. EDTA is

a) Ethylene diamino tetra acetate    b) Ethylene diamine tetra acetic acid  
c) ( ethylene dinitrilo ) tetra acetic acid    **d) both b and c**

10. EDTA molecule has \_\_\_\_\_ group for binding a metal ion

**a) 4- carboxy and 2 amino group**    b) ) 2- carboxy and 4- amino groups  
c) 4- carboxyl and 4-amino group    d) ) 2- carboxy and 4 amino group

11. EDTA forms chelate with all metal cations except

a) Transition metal    **b) Alkali metals**  
c) Alkaline earth metal    d) non metals

12. Erichrome black T is

**a) Weak acid**    b) Strong acid    c) weak base    d) Strong base

13. The complexometric titration of metal ion with chelating agent is also called as

a) Chelatometric titration    b) Chromometric titration  
**c) chelometric titration**    d) Chematometric titration

14. EDTA is generally represented as

a)  $\text{HY}_4$     **b)  $\text{H}_4\text{Y}$**     c)  $\text{HY}_4^-$     d)  $\text{YH}_4\text{Y}^-$

15. There are .....types of ligand.

a) Two.    **b) Three.**    c) four    d) one

16. The ligand that contain only one donor atom or group is called as .....

a) **Monodentate ligand.**

b) Bidentate ligand

c) Polydentate ligand

d) None of these.

17. An organic Polydentate ligand that has two or more groups capable of complexing with same metal ion to form a five or six membered ring is called as .....

A) Chelates.

B) Chelation

**C) Chelating agent.**

D) None of these.

18. The ligand that contain two donor groups is called as .....

**A) Bidentate ligand.**

B) Monodentate ligand

C) Polydentate ligand.

D) Chelates.

19. The ligand that contain many donar atoms or groups is called as .....

A) Monodentate ligand

B) Bidentate ligand

**C) Polydentate ligand.**

D) None of these

20. There are about ..... organic compounds that can be used as indicators in EDTA titration.

A) 150.

B) 160.

C) 180.

**D) 200**

21. Complexing agent is .....

**A) Electron donating ions**

B) Electron accepting ions.

C) a and b

D) None of above

22. Which sentence is false about complexometric titration.

A) It is formed neutral molecule.

B) The anion is first precipitated with a metal cation in indirect titration.

C) The anion and neutral molecule is known as ligand.

**D) It is used to study for compound solubility.**

23. Complexometric titrations are useful for the determination ?

A) Non metal ions.

B) Basic drug.

**C) Metal ions.**

D) None of the above.

24. The metal indicator complex must possess sufficient stability to .....

A) Resist dissociation.

B) Sharp color change.

**C) a and b.**

D) None of the above

25. The process of formation of a metal chelate from metal ion and Polydentate ligand by formation of five or six membered heterocyclic ring is called as .....

**A) Chelation.**

B) Chelates

C) Chelating agent.

D) None of these.

26 Gravimetric analysis involves conversion of analyte into... ..

A. Insoluble compound

B. Solution compound

C. Precipitate

**D. Both a &c**

27. Gravimetric analysis is a type of... ..

A. Qualitative analysis

**B. Quantitative analysis**

C. Titrimetric analysis

D. Volumetric analysis

28. which one of the following is not an advantage of gravimetric Analysis?

**A. It is time saving method**

B. It is accurate and precise method

C. Sources of errors can be readily checked

D. Apparatus are simple and not expensive

29 .solubility is expressed in.....

A. Grams per ml

B. Moles per ml

**C. Moles per lit**

D. Both a & b

30 .sparingly soluble salt is.....salt

A. Completely soluble

B. Completely Insoluble

**C. Less than 1%soluble**

D. More than 10%soluble

31 .which of the following is sparingly soluble salt?

A. Agcl

B. Baso4

C. Pbl2

**D. All of these**

32. which of the following is not sparingly soluble salt?

A. Mg(OH)<sub>2</sub>

B. Ag<sub>2</sub>Cro<sub>4</sub>

**C. Ni(No<sub>3</sub>)<sub>2</sub>**

D. Al(OH)<sub>3</sub>

33. when sparingly soluble salt is added to water.

- A. Small portion of it dissolves
- B. Most of it remain undissolved
- C. There exists equilibrium between ions and undissolved salt
- D. **All the correct**

34. For a sparingly soluble salt AB,  $K_{sp}$  is equal to..

- A.  $(A^+) + (B^+)$
- B.  **$(A^+) (B^+)$**
- C.  $(A^+)^2 (B^+)^2$
- D.  $(A^+) (B^+) / (AB)$

35. For sparingly soluble salt of  $AB_2$  type, solubility product is equal to

- A.  **$(A^{+2})(B^-)^2$**
- B.  $(A^+)(B^-)$
- C.  $(A^+)^2 (B^-)^2$
- D.  $(A^{+2}) (B^-)$

36. If solubility of AgCl is S then solubility product is.....

- A.  $4S^3$
- B.  $\sqrt{s}$
- C.  $s^2$
- D.  $4s^3$

37. For  $AB_2$  or  $A_2B$  type of salts like  $Mg(OH)_2$  and  $Ag_2CrO_4$  solubility is S then solubility product is equal to.....

- A.  **$4S^3$**
- B.  $S^2$
- C.  $2s^2$
- D.  $4s^3$

38. If solubility product of AgCl is  $1 \times 10^{-10}$  then concentration of  $Ag^+$  ions is.....

- A.  $1 \times 10^{-20}$
- B.  **$1 \times 10^{-5}$**
- C.  $0.5 \times 10^{-10}$
- D.  $2 \times 10^{-5}$

39. If solution contain more of the dissolved salt then it could be dissolved under normal circumstances, it is called.....

- A. Saturation
- B. **Super saturation**
- C. Nucleation
- D. Precipitation

40 .For precipitation the necessary condition is.....

- A.  **$K_{sp} < \text{Ionic product}$**
- B. Ionic product  $< K_{sp}$
- C. Ionic product  $= K_{sp}$
- D. None of these

41 which is correct sequence of steps in gravimetric Analysis?

- A. Filtration, digestion, washing
- B. **Digestion, filtration, washing**
- C. Digestion, washing, filtration
- D. Filtration, washing, digestion

42. which one of the following is favourable conditions for precipitation?

- A. It should be carried out in dilute solution
- B. Reagents should be mixed slowly with constant stirring
- C. It should be carried out by using hot solutions
- D. **All the correct**

43. .wrong statement regarding digestion process is.....

- A. Precipitate is heated at low flame for an hour
- B. It is also called Oswald ripening
- C. **Small crystals grow and large crystals dissolved**
- D. Precipitate can be readily filtered due to digestion

44 .If impurity is adsorbed on surface of precipitate, it is an example of.....

- A. Coprecipitation
- B. Occlusion
- C. Surface adsorption
- D. **Both a & c**

45 .During post precipitation.....

- A. Impurity is trapped in the crystal
- B. **Second substance slowly precipitates**
- C. Impurity is adsorbed on surface
- D. None of these

46..which of the following is porous medium for separation of precipitate from mother liquor.

- A. Filter Paper
- B. Gooch crucible
- C. Sintered glass crucible
- D. **All of these**

47..which is not requirement of wash liquid?

- A. It should not dissolve precipitate
- B. It should dissolve impurities
- C. **It should carry out peptization**
- D. It should be easily evaporated

48.drying is the process of removal of.....

- A. **Solvent water**
- B. Occluded water
- C. Adsorbed water
- D. Water of crystallisation

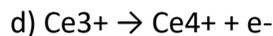
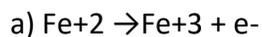
49 .Ignition process is carried out for removal of.....

- A. Adsorbed & absorbed water
- B. Occluded and included water
- C. Water of crystallisation
- D. **All of these**

50 .Pure water is not used as wash liquid because it carry out.....

- A. Coprecipitation
- B. Post precipitation
- C. **Peptization**
- D. Coagulation

51 Which half reaction correctly represents reduction



52. Which statement correctly describes a redox reaction

a) **Oxidation half reaction and reduction half reaction occur simultaneously**

b) Oxidation half reaction occurs before reduction half reaction

c) Oxidation half reaction occurs after reduction half reaction

d) Oxidation half reaction occurs spontaneously but reduction half reaction does not

53. . Which quantities are conserved in all oxidation reduction reactions?

a) Only charge

b) Only mass

c) **Both charge and mass**

d) Charge but not mass

54. When substance is oxidized, it

a) Loses protons

b) Gains protons

c) Acts as oxidizing agent

d) **Acts as reducing agent**

55. Starch can be used as an indicator of the detection trace of

a) Glucose in aqueous solution

b) Protein in blood

c) **Iodine in aqueous solution**

d) Urea in blood

56. When  $\text{KMnO}_4$  solution is titrated with a solution containing  $\text{Fe}^{+2}$

, the indicator used in the titrations is

a) Phenolphthalein

b) Methyl orange

c) Starch

D.  **$\text{KMnO}_4$**

57. When substance is reduced, it

- a) Loses protons
- b) Gains protons
- c) Acts as oxidizing agent**
- d) Acts as reducing agent

58.  $\text{KMnO}_4$  is a...

- A. Reducing agent**
- B. Self indicator**
- C. Common salt
- D. Analyte

59. The ligand that contain two donar atoms or groups is called as .....

- A) Monodentate ligand
- B) Bidentate ligand**
- C) Polydentate ligand.**
- D) None of these

60 . Methods used in analytical chemistry for the quantitative determination of an analyte

- A. Volumetric analysis
- B. Gravimetric analysis**
- C. Quantitative analysis
- D. Qualitative analysis

61. The chemical we are trying to quantify is sometimes called .....

- A. Sample

**B. Analyte**

C. Titrant

D. Precipitation

62. filter paper, is used for quantitative and gravimetric analysis

A. Simple filter paper

**B. Ash free**

C. None of rhe above

D. Both of the above

63. Step refers to the coagulation of a precipitate into a filterable form. .

A. Ignition

**B. Digestion**

C. Filtration

D. Precipitation

64. The chemical that is added to cause the precipitation is called

A. Gravimetric reagent

**B. Precipitation reagent**

C. Analyte

D. Reactants

65. Measuring the solids suspended in the water sample is an example of

A. Volumetric analysis

**B. Gravimetric analysis**

C. Quantitative analysis

D. Qualitative analysis

66. High temperature drying is called as

A. Drying

B. Combustion

C. **Ignition**

D. Pyrolysis

67. The ..... process provides very little room for instrumental error

and does not require a series of standards for calculation of an unknown compounds

A. Volumetric analysis

B. **Gravimetric analysis**

C. Quantitative analysis

D. Qualitative analysis

68. undesired impurities often combine with the analyte, resulting in excess mass is called

A. Precipitation

B. **Coprecipitation**

C. Digestion

D. Collision

69. occlusion is a type of....

A. Precipitation

B. **Coprecipitation**

C. Digestion

D. Collision

70 . determining the concentration of a given analyte by causing a redox reaction between the titrant and the analyte is

A. Precipitation

**B. Redox titration**

C. Volumetric titration

D. Complexometric titration

71. Iodometry is an example of ....

A. Precipitation

**B. Redox titration**

C. Volumetric titration

D. Complexometric titration

72. indicators that undergoes a definite color change at a specific electrode potential is

A. Self indicator

**B. Redox indicator**

C. Both of the above

D. None of the above

73. the point during a titration when an indicator shows that the amount of reactant necessary for a complete reaction has been added to a solution is called

A. Equilibrium

**B. End point**

C. Final reading

D. Bullet reading

74. Ferroin is suitable as a

- A. Self indicator
- B. Redox indicator**
- C. Precipitating reagent
- D. None of the above

75. Phenolphthalein is a

- A. Self indicator
- B. Redox indicator
- C. Precipitating reagent
- D. pH indicator**

76. An acid-base indicator ,changes color depending on the ....

- A. pH**
- B. Precipitation
- C. Temperature
- D. Pressure

77. the complex of 1,10-phenanthroline and Fe(II) is called

- A. Phenolphthalein
- B.ferroin**
- C. Methyl orange
- D. None of the above

78. Ferroin, diphenylamine, methyl red can be .....

- A. Self indicator

**B. Redox indicator**

C. Precipitating reagent

D. None of the above

79. Which is self indicator....

A. Iodine

B.  $\text{KMNO}_4$

C. Ferroin

**D. Both A and B**

**80.** Indicator used in EDTA titrations

A. Fast Sulphon Black,

B. Eriochrome Black T,

C. Eriochrome red B

**D. All of the above**

**81.** powerful complexing agent of metals is

A. EBT

**B. EDTA**

C. Ferroin

D.  $\text{KMNO}_4$

82. determination of a mixture of different metal ions in solution is called as.....

A. Precipitation

B. Redox titration

C. Volumetric titration

#### D. Complexometric titration

83. EDTA is a...

- A. Lewis base
- B. Ethylene diamine tetraacetic acid
- C. Chelating agent
- D. **All of the above**

84. copper-EDTA complex is very stable because

- A. **Multidentate ligands form stable complex**
- B. It is lewis base
- C. It is chelating agent
- D. None of the above

85. known excess of standard solution EDTA is added to the solution containing the analyte is called.....

- A. Direct titration
- B. **Back titration**
- C. Blank titration
- D. Standardisation

86. Which pH is mostly maintained in complexometric titration...

- A. 8
- B. **10**
- C. 5
- D. 7

87. Which buffer is used in EDTA method?

A. **Ammonia buffer**

B. Carbonate

C. Both A and B

D. None of the above

88. phosphates, phosphonates, polycarboxylates, and zeolites are..

A. Precipitating reagent

B. Indicator

C. **Complexing agent**

D. Self indicator

89. precipitation where the precipitation of the undesirable compound occurs after the formation of the precipitate of the desired compound.

A. Coprecipitation

B. **Post precipitation**

C. Occulusion

D. None of the above

90. when the impurity occupies a lattice site in the crystal structure of the analyte is called..

A. Occulusion

B. **Inclusion**

C. Post precipitation

D. None of the above

91. impurity that is weakly bound to the surface of the precipitate is....

A. **Adsorbate**

B. Dust

C. Precipitation

D. None of the above

92. when an adsorbed impurity gets physically trapped inside the crystal of precipitation as it grows...

A. **Occlusion**

B. Inclusion

C. Post precipitation

D. None of the above

93. treating a solution of iodine with a reducing agent to produce iodide using a starch indicator to help detect the endpoint.

A. Precipitation

B. **Redox titration**

C. Volumetric titration

D. Complexometric titration

94. The titrations with silver nitrate are known as

A. Precipitation

B. **Argentometric titration**

C. Volumetric titration

D. Complexometric titration

95. chromate ions are used as the indicator in..

A. **Mohr's method**

B. Iodometry

C. Titrimetry

D. Argentometric

96. PERMANGNOMETRY is a type of...

A. Precipitation

B. **Redox titration**

C. Volumetric titration

D. Complexometric titration

96. Solubility product increase with increase in .

A. Pressure

B. Volume

C. Ionisation

D. **Temperature**

97. the higher the  $K_{sp}$  value of a substance...

A. **Higher will be the solubility**

B. Lower will be the solubility

C. Cannot define

D. Both A and B

98. the product of the solubilities of the ions in moles per liter is literally...

A. **Solubility product**

B. Solubility

C. Both A and B

D. None of the above

99. fluorescein is a...

A. **Adsorption indicator**

B. Redox indicator

C. Self indicator

D. pH indicator

100. the vessel in which precipitate is to be dried, possibly ashed, and finally weighed in gravimetric analysis

A. Petridish

B. China dish

C. **Gooch crucible**

D. Metal cone