QB365 Question Bank Software Study Materials

Coordination Chemistry 50 Important 1 Marks Questions With Answers (Book Back and Creative)

12th Standard

Chemistry

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

1) The sum of primary valence and secondary valence of the metal M in the complex $[M(en)_2(Ox)]Cl$ is_____.

(a) 3 (b) 6 (c) -3 **(d) 9**

2) An excess of silver nitrate is added to 100ml of a 0.01M solution of pentaaquachloridochromium(III)chloride. The number of moles of AgCl precipitated would be _____.

(a) 0.02 **(b) 0.002** (c) 0.01 (d) 0.2

3) A complex has a molecular formula $MSO_4Cl.6H_2O$. The aqueous solution of it gives white precipitate with Barium chloride solution and no precipitate is obtained when it is treated with silver nitrate solution. If the secondary valence of the metal is six, which one of the following correctly represents the complex?

(a) $[M(H_2O)_4Cl]SO_4.2H_2O$ (b) $[M(H_2O)_6]SO_4$ **(c) $[M(H_2O)_5Cl]SO_4.H_2O$** (d) $[M(H_2O)_3Cl]SO_4.3H_2O$

4) Oxidation state of Iron and the charge on the ligand NO in $[Fe(H_2O)_5NO]SO_4$ are_____.

(a) +2 and 0 respectively (b) +3 and 0 respectively (c) +3 and -1 respectively **(d) +1 and +1 respectively**

5) As per IUPAC guidelines, the name of the complex $[Co(en)_2(ONO)Cl]Cl$ is _____.

(a) chlorobisethylenediaminenitritocobalt(III) chloride (b) chloridobis(ethane-1, 2-diamine)nitro K-Ocobaltate(III) chloride

(c) chloridobis(ethane-1, 2-diammine)nitrito K-Ocobalt(II) chloride

(d) chloridobis(ethane-1, 2-diamine)nitrito K-O cobalt(III) chloride

6) IUPAC name of the complex $K_3[Al(C_2O_4)_3]$ is _____.

(a) potassiumtrioxalatoaluminium(III) (b) possiumtrioxalatoaluminate(II) (c) potassiumtrisoxalatoaluminate(III)

(d) potassiumtrioxalatoaluminate(III)

7) A magnetic moment of 1.73BM will be shown by one among the following.

(a) $TiCl_4$ (b) $[CoCl_6]^{4-}$ **(c) $[Cu(NH_3)_4]^{2+}$** (d) $[Ni(CN)_4]^{2-}$

8) Crystal field stabilization energy for high spin d^5 octahedral complex is _____.

(a) $-0.6\Delta_0$ **(b) 0** (c) $2(P-\Delta_0)$ (d) $2(P+\Delta_0)$

9) In which of the following coordination entities the magnitude of Δ_0 will be maximum?

(a) $[Co(CN)_6]^{3-}$ (b) $[Co(C_2O_4)_3]^{3-}$ (c) $[Co(H_2O)_6]^{3+}$ (d) $[Co(NH_3)_6]^{3+}$

10) Which one of the following will give a pair of enantiomorphs?

(a) $[Cr(NH_3)_6][Co(CN)_6]$ **(b) $[Co(en)_2Cl_2]Cl$** (c) $[Pt(NH_3)_4][PtCl_4]$ (d) $[Co(NH_3)_4Cl_2]NO_2$

11) Which type of isomerism is exhibited by $[Pt(NH_3)_2Cl_2]$?

(a) Coordination isomerism (b) Linkage isomerism (c) Optical isomerism **(d) Geometrical isomerism**

12) How many geometrical isomers are possible for $[Pt(Py)(NH_3)(Br)(Cl)]$?

(a) 3 (b) 4 (c) 0 (d) 15

Which one of the following pairs represents linkage isomers?

13) (a) $[Cu(NH_3)_4][PtCl_4]$ and $[Pt(NH_3)_4][CuCl_4]$ (b) $[Co(NH_3)_5(NO_3)]SO_4$ and $[Co(NH_3)_5(ONO)]$

(c) $[Co(NH_3)_4(NCS)_2]Cl$ and $[Co(NH_3)_4(SCN)_2]Cl$ (d) both (b) and (c)

14) Which kind of isomerism is possible for a complex $[Co(NH_3)_4Br_2]CI$?

(a) geometrical and ionization (b) geometrical and optical (c) optical and ionization (d) geometrical only

15) Which one of the following complexes is not expected to exhibit isomerism?

(a) $[Ni(NH_3)_4(H_2O)_2]^{2+}$ (b) $[Pt(NH_3)_2Cl_2]$ (c) $[Co(NH_3)_5SO_4]Cl$ **(d) $[FeCl_6]^{3-}$**

16) A complex in which the oxidation number of the metal is zero is_____.

(a) $K_4[Fe(CN)_6]$ (b) $[Fe(CN)_3(NH_3)_3]$ **(c) $[Fe(CO)_5]$** (d) both (b) and (c)

17) Formula of tris(ethane-1, 2-diamine)iron(II)phosphate _____.

(a) $[Fe(CH_3\text{-}CH(NH_2)_2)_3](PO_4)_3$ (b) $[Fe(H_2N\text{-}CH_2\text{-}CH_2\text{-}NH_2)_3](PO_4)$ (c) $[Fe(H_2N\text{-}CH_2\text{-}CH_2\text{-}NH_2)_3](PO_4)_2$

(d) $[Fe(H_2N\text{-}CH_2\text{-}CH_2\text{-}NH_2)_3]_3(PO_4)_2$

18) Which of the following is paramagnetic in nature?

(a) $[Zn(NH_3)_4]^{2+}$ (b) $[Co(NH_3)_6]^{3+}$ **(c) $[Ni(H_2O)_6]^{2+}$** (d) $[Ni(CN)_4]^{2-}$

19) Fac-mer isomerism is shown by _____.

(a) $[CO(en)_3]^{3+}$ (b) $[Co(NH_3)_4(Cl)_2]^{+}$ **(c) $[Co(NH_3)_3(Cl)_3]$** (d) $[Co(NH_3)_5Cl]SO_4$

20) Choose the correct statement.

(a) Square planar complexes are more stable than octahedral complexes

(b) The spin only magnetic moment of $[Cu(Cl)_4]^{2-}$ is BM and it has square planar structure.

(c) Crystal field splitting energy (Δ_0) $[FeF_6]^{4-}$ is higher than the (Δ_0) of $[Fe(CN)_6]^{4-}$

(d) crystal field stabilization energy of $[V(H_2O)_6]^{2+}$ is higher than the crystal field stabilization of $[Ti(H_2O)_6]^{2+}$

21) Identify the ambidentate ligand among the following.

(a) NH_3 (b) $C_2O_4^{2-}$ (c) NO_2^- **(d) SCN^-**

22) Structural formula of tetra aquadichlorideo Chromium (III) chloride _____.

(a) $[Cr(H_2O)_4Cl_2]Cl_2$ (b) $[Cr(H_2O)_4Cl_3]$ (c) $[(H_2O)_4Cl_2Cr]Cl_2$ (d) $[Cl_2(H_2O)_4Cr]Cl_3$

23) $[Fe(H_2O)_6]^{3+}$ and $[Fe(CN)_6]^{3-}$ differ in _____.

(a) magnetic nature (b) co-ordination number (c) oxidation number (d) Structure

24) Which of the following is correct statement?

(a) $[Ti(H_2O)_6]^{3+}$ is coloured complex (b) $[Sc(H_2O)_6]^{3+}$ is colourless complex

(c) d-d transition is not possible in $[Sc(H_2O)_6]^{3+}$ complex **(d) All of these**

25) Which of the following co-ordination compounds would exhibit optical isomerism?

(a) Pemtaamminenitrocobalt (III) iodide (b) Diamminedichloropaltinum (II)

(c) Tris-(ethylenediamine) cobalt (III) bromide (d) Transdicyanobis(ethylenediamine) chromium (III) chloride

26) Which among the following square planar complexes will exhibet geometrical isomerism?

(a) $[Ma_2B_2]^{n\pm}$ (b) $[MA_2BC]^{n\pm}$ (c) $[M(xy)]^{n\pm}$ **(d) all the above**

27) An example of an ambidentate ligand is _____.

(a) CN^- (b) Cl^- **(c) NO^-_2** (d) I^-

28) What is the electronic configuration of Cr in $K_3[Cr(C_2O_4)_3]\ 3H_2O$?

(a) d^3 (b) d^2 (c) d^1 (d) d^0

29) Which of the following is wrong about double salts?

(a) retain their properties only in solid state (b) contains two or more salt in stoichiometric proportions

(c) they don't dissociate into its constituent ions (d) none of the above

30) A 'd' block metal ion has a magnetic moment of 1.732 BM. The number of unpaired electrons are _____.

(a) 1 (b) 2 (c) 3 (d) 4

31) The number of trans positions in a octahedral complex is _____.

(a) 6 (b) 4 **(c) 3** (d) 2

32) Magnetic moment is given by the formula _____.

(a) $\sqrt{n(n+1)}$ **(b)** $\sqrt{n(n+2)}$ (c) $\sqrt{(n+2)}$ (d) $\sqrt{n^2+(n+2)}$

33) The oxidation state of the central metal ion in the complex $[Co(H_2O)(CN)(en)_2]^{2+}$ is_____.

(a) 0 (b) +1 (c) +2 **(d) +3**

34) The oxidation state of nickel in $[Ni(CO)_4]$ is_____.

(a) 0 (b) +1 (c) +2 (d) +3

35) Co-ordination number of Ni in $[Ni(C_2O_4)_3]^{4-}$ is _____.

(a) 3 **(b) 6** (c) 4 (d) 2

36) _____, a pigment present in plants acting is a photo sensitizer in the photosynthesis is also a coordination compound.

(a) Haemoglobin **(b) Chlorophyll** (c) Chlorophll 'a' (d) Chlorophyll 'd'

37) When two or more stable compounds in solution are mixed together and allowed to evaporate, in certain cases there is a possibility for the formation of _____.

(a) mixed salts (b) double salts (c) co-ordination compounds **(d) both (b) & (c)**

38) The colour of potassium ferric thiocyanate $K_3[Fe(SCN)_6]$ is _____.

(a) deep blue (b) dark green **(c) blood red** (d) violet

39) Werner's theory does not explain the _____.

(a) magnetic property (b) valencies (c) co-ordination nature (d) ligands

40) Which one is cationic complex?

(a) $[Ag(CN)_2]^-$ (b) $[Fe(CO)_5]$ **(c)** $[Ag(NH_3)_2]^+$ (d) $[Fe(CN)_6]^{4-}$

41) Which one is anionic complex?

(a) $[Ag(CN)_2]^-$ (b) $[Ag(NH_3)_2]^+$ (c) $[Ni(CO_4)]$ (d) $[Co(NH_3)_6]^{3+}$

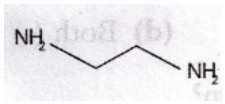
42) If the central metal ion/atom is co-ordinated to more than one kind of ligands, then the complex is called a _____.

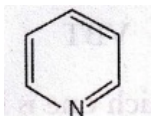
(a) homoleptic complex **(b) heteroleptic complex** (c) both (a) & (b) (d) none of these

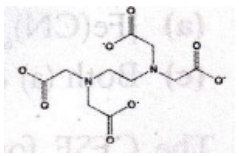
43) This term is used to denote an ambidendate ligands _____.

(a) v **(b) k** (c) λ (d) μ

44) EDTA is _____.

(a) 

(b) 

(c) $p(ph_3)$ **(d)** 

45) In chromium anionic complex, chromium is represented as _____.

(a) chromic **(b) chromate** (c) chrome (d) chromium

46) The ligand in $K_4[Fe(CN)_6]$ is _____.

(a) Fe (b) K **(c) CN^-** (d) Fe & CN

47) Penta carbonyl triphenyl phosphane chromium (o) is _____.

(a) $[Cr(PPh_4)(CO)_4]$ **(b) $[Cr(PPh_3)(CO)_5]$** (c) $[Cr(PPh_3)(CO)_5]$ (d) $[Cr(Ph_3P_4](CO)_4]$

48) The name of the linkage isomer of $[Co(NH_3)5NO_2]Cl_2$ is _____.

(a) Pentaammine nitro cobalt(Il) chloride (b) Pentaammine nitro chloro cobaltate (II)

(c) Pentaammine nitrito cobalt(III) chloride (d) Pentanitrosoammin chloro cobaltate (III)

49) An example for poly nuclear carbonyl is _____.

(a) $[Fe_3(CO)_{12}]$ (b) $[Co_2(CO)_8]$ (c) $[MnRe(CO)_{10}]$ **(d) All of these**

50) Phthalo-blue-a bright blue pigment is a complex of copper (II) ion and it is used in _____.

(a) printing ink (b) packaging industry **(c) both (a) & (b)** (d) none