CHEMISTRY

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CO-ORDINATION CHEMISTRY

Evaluate Yourself

1. When a coordination compound $CrCI_3 . 4H_2O$ is mixed with silver nitrate solution, one mole of silver chloride is precipitated per mole of the compound. There are no free solvent molecules in that compound. Assign the secondary valence to the metal and write the structural formula of the compound.

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2. In the complex. $\left[Pt(NO_2)(H_2O)(NH_3)_2\right]Br$, identify the following

Central metal atom ion

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3. In the complex. $\left[Pt(NO_2)(H_2O)(NH_3)_2\right]Br$,

identify the following

Ligand(s) and their type

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4. In the complex. $\left[Pt(NO_2)(H_2O)(NH_3)_2\right]Br$,

identify the following

Coordination entity

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5. In the complex. $\left[Pt(NO_2)(H_2O)(NH_3)_2\right]Br$, identify the following

Oxidation number of the central metal ion

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6. In the complex. $\left[Pt(NO_2)(H_2O)(NH_3)_2\right]Br$, identify the following

Coordination number

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7. Write the IUPAC name for the following compounds.

$K_2[Fe(CN)_3(Cl)_2(NH_3)]$

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8. Write the IUPAC name for the following compounds.

$[Cr(CN)_2(H_2O)_4][CO(OX)_2(\text{en})]$

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9. Write the IUPAC name for the following compounds.

$[Cu(NH_3)_2Cl_2]$

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10. Write the IUPAC name for the following compounds.

$[Cr(NH_3)_3(NC)_2(H_2O)]^+$

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11. Write the IUPAC name for the following compounds.

$[Fe(CN)_6]^+$

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12. Give the structure for the following compounds

diamminesilver (I) dicyanidoargntate (I)

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13. Give the structure for the following compounds

Pentaammine nitrito- K Ncobalt (III) ion.

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14. Give the structure for the following compounds

hexafluoro cobaltate (III) ion

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15. Give the structure for the following compounds

dichloridobis(ethylenediamine) Cobalt (III) sulphate.

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16. Give the structure for the following compounds

Tetracarbonylnickel (0)

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17. Three compounds A B and C have empirical formula $CrCl_3 . 6H_2O$. they are kept in a container with a dehydrating agent and they lost water and attiring constant weight as shown below.

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18. Indicate the possible type of isomers for the following complexes and draw their isomers

$[Co(en)_3][Cr(CN)_6]$

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19. Indicate the possible type of isomers for the following complexes and draw their isomers

$\left[Co(NH_3)_5(NO_2)\right]^{2+}$

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20. Indicate the possible type of isomers for the following complexes and draw their isomers

$\left[Pt(NH_3)_3NO_2\right]Cl$

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21. Draw all possible stereo isomers of a complex

$Ca\left[Co(NH_3)Cl(Ox)_2\right]$

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22. The spin only magnetic moment of Tetrachloride Manganate (II)ion is 5,9 BM. On the basis of VBT, predict the type of hybridisation and geometry of the compound.

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23. Predict the number of unpaired electrons in $[CoCl_4]^{2-}$ ion on the basis of VBT.

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24. A metal complex having composition $[Co(en)_2Cl_2Br]$ has been isolated in two forms A and B. (B) reacted with silver nitrate to give a white precipitate readily soluble in ammonium hydroxide whereas A gives a pale yellow precipitate. Write the formula of A and B.

State the hybridization of Co in each and calculate their spin only magnetic moment.

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25. The mean pairing energy and octahedral field splitting energy of $\left[Mn(CN)_6\right]^{3-}$ are 28,800 cm^{-1} and 38500 cm^{-1} respectively. Whether this complex is stable in low spin or high spin?

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26. Draw energy level diagram and indicate the number of electrons in each level for the complex $\left[Cu(H_2O)_6\right]^{2+}$. Whether the complex is paramagnetic or diamagnetic?

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27. For the $\left[CoF_6\right]^{3-}$ ion the mean pairing energy is found to be $21000cm^{-1}$. The magnitude of Δ_0 is $13000cm^{-1}$. Calculate the crystal field stabilization energy for this complex ion corresponding to low spin and high spin states.

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Textbook Question Answers Choose The Correct Answer

1. The sum of primary valence and secondary valence of the metal M in the complex $\left[M(en)_2(Ox)\right]Cl$ is :

A. 3

B. 6

C. -3

D. 9

Answer: D

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2. An excess of silver nitrate is added to 100ml of a 0.01M solution of penta aqua chlorido chromium (III) chloride. The number of moles of AgCl precipitated would be:

A. 0.02

B. 0.002

C. 0.01

D. 0.2

Answer: B

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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. $[M(H_2O)_3Cl]SO_4.\,3H_2O$

Answer: C

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4. Oxidation state of Iron and the charge on the ligand NO in $\left[Fe(H_2O)_5NO\right]SO_4$ are:

A. $+2$ and 0 respectively

B. $+3$ and 0 respectively

C. $+3$ and -1 respectively

D. $+1$ and +1 respectively

Answer: D

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5. As per IUPAC guidelines, the name of the complex $\left[Co(en)_2(ONO)Cl\right]Cl$ 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) nitro k-Ocobalt (III) chloride

Answer: D

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

:

A. potassiumtrioxalatoaluminium(III)

B. potassiumtrioxalatoaluminate(II)

C. potassiumtrisoxalatoaluminate(III)

D. potassium trioxalatoaluminate(III)

Answer: D

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

A. $TiCl_4$

B. $\left[CoCl_6\right]^{4-}$

C. $\left[Cu(NH_3)_4\right]^{2+}$

D. $\left[Ni(CN)_4\right]^{2-}$

Answer: C

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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. $2(P + \Delta_0)$

Answer: B

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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. $[Co(NH_3)_6]^{3+}$

Answer: A

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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. $[Co(NH_3)_4Cl_2]NO_2$

Answer: B

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

A. Coordination isomerism

B. Linkage isomerism

C. Optical isomerism

D. Geometrical isomerism

Answer: B

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12. How many geometrical isomers are possible for < < EVA035.eps > >?

A. 3

B. 4

C. 0

D. 15

Answer: A

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13. Which one of the following pairs represents linkage isomers?

A. $\left[Cu(NH_3)_4\right][PtCl_4]$ and $\left[Pt(NH_3)_4\right][CuCl_4]$

B. $\left[Co(NH_3)_5(NO_3)\right]SO_4$ and $\left[Co(NH_3)_3(ONO)\right]$

C. $[Co(NH_3)_4(NCS)_2Cl]$ and

$[Co(NH_3)_4(SCN)_2]Cl$

D. both (b) and (c)

Answer: C

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14. Which kind of isomerism is possible for a complex $[MA_4B_2]^{n+}$?

A. geometrical and ionization

B. geometrical and optical

C. optical and ionization

D. geometrical only

Answer: A

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

A. $\left[Ni(NH_3)_4(H_2O)_2\right]^{2+}$

B. ltltEVA041.epsgtgt

C. $[Co(NH_3)_5SO_4]Cl$

D. $[Fe(en)_3]^{3+}$

Answer: D

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

A. $K_4[Fe(CN)_6]$

B. $\left[Fe(CN)_3(NH_3)_3\right]$

C. $\left[Fe(CO)_5\right]$

D. both (b) and (c)

Answer: C

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

A. $\left[Fe\left(CH_3 - CH(NH_2)_2\right)_3\right](PO_4)_3$

B.

$$\left[Fe(H_2N-CH_2-CH_2-NH_2)_3\right](PO_4)$$

C.

$$\left[Fe(H_2N-CH_2-CH_2-NH_2)_3\right](PO_4)_2$$

D.

$$\left[Fe(H_2N-CH_2-CH_2-NH_2)_3\right]_3(PO_4)_2$$

Answer: D

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18. Which of the following is paramagnetic in nature ?

A. $\left[Zn(NH_3)_4\right]^{2+}$

B. $\left[Co(NH_3)_6\right]^{3+}$

C. $\left[Ni(H_2O)_6\right]^{2+}$

D. $\left[Ni(CN)_4\right]^{2-}$

Answer: C

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19. Fac-mer isomerism is shown by

A. $\left[Co(en)_3\right]^{3+}$

B. $\left[Co(NH_3)_4(Cl)_2\right]^{+}$

C. $\left[Co(NH_3)_3(Cl)_3\right]$

D. $\left[Co(NH_3)_5Cl\right]SO_4$

Answer: C

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20. Choose the correct statement.

A. Square planar complexes are more stable than octahedral complexes

B. The spin only magnetic moment of $\left[Cu(CI)_4\right]^{2-}$ is 1.732 BM and it has square planar structure.

C. Crystal field splitting energy (Δ_0) of $[FeF_6]^{4-}$ is higher than the (Δ_0) of $\left[Fe(CN)_6\right]^{4+}$

D. Crystal field stabilization energy of $\left[V(H_2O)_6\right]^{2+}$ is higher than the crystal field stabilization of $\left[Ti(H_2O)_6\right]^{2+}$

Answer: D

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Textbook Question Answers Answer The Following Question

1. Write the IUPAC names for the following complexes.

$Na_2[Ni(EDTA)]$

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2. Write the IUPAC names for the following complexes.

$[Ag(CN)_2]^-$

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3. Write the IUPAC names for the following complexes.

$[Co(en)_3]_2(SO_4)_3$

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4. Write the IUPAC names for the following complexes.

$[Co(ONO)(NH_3)_5]^{2+}$

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5. Write the IUPAC names for the following complexes.

$[Pt(NH_3)_2Cl(NO_2)]$

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6. Write the formula for the following coordination compounds.

potassiumhexacyanidoferrate(II)

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7. Write the formula for the following coordination compounds.

pentacarbonyliron(O)

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8. Write the formula for the following coordination compounds.

pentaamminenitrito -k -N-cobalt(III)ion

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9. Write the formula for the following coordination compounds.

hexaamminecobalt(III)sulphate

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10. Write the formula for the following coordination compounds.

sodiumtetrafluoridodihydroxidochromate (III)

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11. Arrange the following in order of increasing molar conductivity

(i)$Mg\left[Cr(NH_3)(Cl)_5\right]$

(ii) $\left[Cr(NH_3)_5Cl\right]_3[CoF_6]_2$

(iii) $\left[Cr(NH_3)_3Cl_3\right]$

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12. Ni^{2+} is identified using alcoholic solution complex of dimethyl glyoxime. Write the structural formula for the rosy red precipitate of a formed in the reaction.

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13. $[CuCl_4]^{2-}$ exists while $[CuI_4]^{2-}$ does not exist why ?

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14. Calculate the ratio of $\frac{[Ag^{+}]}{[Ag(NH_3)_2]^{+}}$ in 0.2 M solution of NH_3. If the stability constant for the complex $[Ag(NH_3)_2]^{+}$ is 1.7×10^{7}.

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15. Give an example of coordination compound used in medicine and two examples of biologically important coordination compounds.

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16. Based on VB theory explain why $\left[Cr(NH_3)_6\right]^{3+}$ is paramagnetic, while $\left[Ni(CN)_4\right]^{2-}$ is diamagnetic .

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17. Draw all possible geometrical isomers of the complex $\left[Co(en)_2Cl_2\right]^{+}$ and identify the optically active isomer.

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18. $\left[Ti(H_2O)_6\right]^{3+}$ is coloured , while $\left[Sc(H_2O)_6\right]^{3+}$ is colourless explain.

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19. Give an example for complex of the type $[Ma_2b_2c_2]$ where a, b, c are monodentate ligands and give the possible isomers.

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20. Give one test to differentiate $[Co(NH_3)_5Cl]SO_4$ and $[Co(NH_3)_5SO_4]Cl$.

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21. In an octahedral crystal field , draw the figure to show splitting of d orbitals.

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22. What is linkage isomerism ? Explain with an example.

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23. Write briefly about the applications of coordination compounds in volumetric analysis.

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24. Classify the following ligand based on the number of donor atoms.

NH_3

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25. Classify the following ligand based on the number of donor atoms.

en(ethane 1,2, diamine)

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26. Classify the following ligand based on the number of donor atoms.

ox^{2-}

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27. Classify the following ligand based on the number of donor atoms.

triaminotriethylamine

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28. Classify the following ligand based on the number of donor atoms.

pyridine

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29. Give the difference between double salts and coordination compounds.

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30. Write the postulates of Werner's theory.

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31. $\left[Ni(CN)_4\right]^{2-}$ is diamagnetic, while $[NiCl_4]^{2-}$ is paramagnetic, explain using crystal field theory.

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32. Why tetrahedral complexes do not exhibit geometrical isomerism.

▶ View Text Solution

33. Explain optical isomerism in coordination compounds with an example.

▶ View Text Solution

34. What are hydrate isomers? Explain with an example.

▶ View Text Solution

35. What is crystal field splitting energy?

▶ View Text Solution

36. What is crystal field stabilization energy (CFSE) ?

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37. A solution of $\left[Ni\left(H_2O\right)_6\right]^{2+}$ is green, whereas a solution of $\left[Ni(CN)_4\right]^{2-}$ is colorless - Explain

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38. Discuss briefly the nature of bonding in metal carbonyls.

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39. What is the coordination entity formed when excess of liquid ammonia is added to an aqueous solution copper sulphate?

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40. On the basis of VB theory explain the nature of bonding in $\left[Co(C_2O_4)_3\right]^{3-}$

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41. What are the limitations of VB theory?

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42. Write the oxidation state, coordination number, nature of ligand, magnetic property and electronic configuration in octahedral crystal field for the complex $K_4\left[Mn(CN)_6\right]$.

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Other Important Question Answer Choose The Correct Answer

1. Which of the following complexes formed by Cu^{+2} ions is the most stable ?

A. $Cu^{+2} + 4NH_3 \Leftrightarrow \left[Cu(NH_3)_4\right]^{+2}$ log k=11.6

B. $Cu^{+2} + 4CN^- \Leftrightarrow \left[Cu(CN)_4\right]^{-2}$ log k =27.3

C. $Cu^{+2} + 2en \Leftrightarrow \left[Cu(en)_2\right]^{+2}$ log k =15.4

D. $Cu^{+2} + 4H_2O \Leftrightarrow \left[Cu(H_2O)_4\right]^{+2}$ log k =8.9

Answer: B

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2. when 1 mol of $CrCl_3 6H_2O$ is treated with excess of $AgNO_3$ 3 mol of AgCl are obtained . The formula of the complex is :

A. $[CrCl_3(H_2O)_3]3H_2O$

B. $[CrCl_2(H_2O)_4]Cl.2H_2O$

C. $[CrCl(H_2O)_5]Cl_2.\ H_2O$

D. $[Cr(H_2O)_6]Cl_3$

Answer: D

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3. The correct IUPAC name of $\left[Pt(NH_3)_2Cl_2\right]$ is

:

A. Diamminedichloroplatinum (II)

B. Diammine dichloro platinum (IV)

C. iammine dichloro platinum (O)

D. Dichloro Diammine platinum (IV)

Answer: A

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4. The stabilisation of coordination compounds due to chelation is called chelate effect. Which of the following is the most stable complex species?

A. $Fe(Co)_5$

B. $\left[Fe(CN)_6\right]^{-3}$

C. $Fe(C_2O_4)_3\left.\right]^{-3}$

D. $\left[Fe(H_2O)_6\right]^{+3}$

Answer: C

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5. The compounds $\left[Co(SO_4)(NH_3)_5\right]Br$ and $\left[Co(SO_4)(NH_3)_5\right]Cl$ represent :

A. linkage isomerism

B. ionisation isomerism

C. coordination isomerism

D. no isomerism

Answer: D

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6. Which of the following species is not expected to be a ligand?

A. NO

B. NH_4^+

C. $NH_2CH_2CH_2NH_2$

D. Co

Answer: B

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7. The oxidation state of Fe in the brown ring complex $[Fe(H_2O)_5NO]SO_4$ is :

A. $+1$

B. $+2$

C. $+3$

D. $+4$

Answer: A

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8. $\left[Co(NH_3)_4(NO_2)_2\right]Cl$ exhibits :

A. ionisation isomerism, geometrical isomerism and optical isomerism.

B. linkage isomerism, geometrical isomerism and optical isomerism.

C. linkage isomerism, ionisation isomerism and optical isomerism.

D. linkage isomerism, ionisation isomerism and geometrical isomerism.

Answer: D

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9. Which of the following complex ions has geometrical isomers?

A. $\left[Co(en)_3\right]^{+3}$

B. $\left[Ni(NH_3)_5Br\right]^{+}$

C. $\left[Co(NH_3)_2(en)_2\right]^{+3}$

D. $\left[Cr(NH_3)_4(en)\right]^{+3}$

Answer: C

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10. The correct statement with respect to the complexes $Ni(CO)_4$ and $\left[Ni(CN)_4\right]^{-2}$ is:

A. nickel is in the same oxidation state in both.

B. both have tetrahedral geometry

C. both have square planar geometry

D. have tetrahedral and square planar geometry respectively.

Answer: D

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11. When 0.01 mole of a cobalt complex is treated with excess $AgNO_3$ solution, 4.305g of silver chloride is precipitated. The formula of the complex is:

A. $[Co(NH_3)_3Cl_3]$

B. $[Co(NH_3)_5Cl]Cl_2$

C. $[Co(NH_3)_6]Cl_3$

D. $[Co(NH_3)_4Cl_2]NO_3$

Answer: C

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12. Amongst $Ni(CO)_4, \left[Ni(CN)_4\right]^{-2}$ and $\left[NiCl_4\right]^{-2}$

A. $Ni(CO)_4$ and $\left[NiCl_4\right]^{-2}$ are diamagnetic and $\left[Ni(CN)_4\right]^{-2}$ is paramagnetic .

B. $\left[NiCl_4\right]^{-2}$ and $\left[Ni(CN)_4\right]^{-2}$ are diamagnetic and $Ni(CO)_4$ is paramagnetic

C. $Ni(CO)_4$ and $\left[Ni(CN)_4\right]^{-2}$ are diamagnetic and $\left[NiCl_4\right]^{-2}$ is paramagnetic

D. $Ni(CO)_4$ is diamagnetic and $[NiCl_4]^{-2}$ and $[Ni(CN)_4]^{-2}$ are paramagnetic .

Answer: C

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13. Which of the following complexes are not correctly matched with the hybridisation of their central metal ion ?

(i)$Ni(CO)_4 \Rightarrow sp^3$

(ii) $\left[Ni(CN)_4\right]^{-2} \Rightarrow sp^3$

(iii) $\left[C_6F_6\right]^{-3} \Rightarrow d^2sp^3$

(iv) $\left[Fe(CN)_6\right]^{-3} \Rightarrow sp^3d^2$

A. (i) and (ii)

B. (ii) ,(iii) and (iv)

C. (i),(ii) and (iii)

D. (ii) and (iv)

Answer: B

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14. Which of the following complexes has minimum magnitude of Δ_0 ?

A. $\left[Cr(CN)_6\right]^{-3}$

B. $\left[Co(NH_3)_6\right]^{+3}$

C. $\left[CoCl_6\right]^{-3}$

D. $\left[Cr(H_2O)_6\right]^{+3}$

Answer: C

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15. Hybridisation, shape and magnetic moment of $K_3\left[Co(CO_3)_3\right]$ is :

A. d^2sp^3, octahedral , 4.9 BM

B. sp^3d^2, octahedral , 4.9BM

C. dsp^2 , square planar , 4.9 BM

D. sp^3 , tetrahedral ,4.9 BM

Answer: B

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16. The spin only magnetic moment value (in Bohr magneton) of $Cr(CO)_6$ is :

A. 0

B. 2.84

C. 4.9

D. 5.92

Answer: A

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17. Among the following complexes (K-P)

$K_3\left[Fe(CN)_6\right] \Rightarrow K,\ \left[Co(NH_3)_6\right]Cl_3 \Rightarrow L$

$Na_3\left[CO(OX)_3\right] \Rightarrow M,\ \left[Ni(H_2O)_6\right]Cl_2 \Rightarrow N$

$K_3\left[Pt(CN)_4\right] \Rightarrow O,\ \left[Zn(H_2O)_6\right](NO_3)_2 \Rightarrow P$

the diamagnetic complexes are :

A. K,L,M,N

B. K,M,O,P

C. L,M,O,P

D. L,M,N,O

Answer: C

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18. Which of the following facts about the complex $\left[Cr(NH_3)_6\right]Cl_3$ is wrong?

A. The complex is paramagnetic

B. The complex is an outer orbital complex

C. The complex gives white precipitate with silver nitrate solution.

D. The complex involves d^2sp^3 hybridisation and is octahedral in shape.

Answer: B

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19. The 'd' electron configuration of $Cr^{+2}, Mn^{+2}, Fe^{+2}$ and Co^{+2} are d^4, d^5, d^6 and d^7 respectively. Which one of the following will exhibit minimum paramagnetic behaviour?

A. $\left[Cr(H_2O)_6\right]^{+2}$

B. $\left[Mn(H_2O)_6\right]^{+2}$

C. $Fe(H_2O)_6]^{+2}$

D. $\left[Co(H_2O)_6\right]^{+2}$

Answer: D

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20. Crystal field stabilisation energy for high spin d^4 octahedral complex is:

A. $-0.6\Delta_0$

B. $-1.8\Delta_0$

C. $-1.66\Delta_0 + P$

D. $-1.2\Delta_0$

Answer: A

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21. In spectrochemical series, chlorine is above H_2O i.e., $Cl > H_2O$. This is due to:

A. Good π acceptor properties of chlorine

B. Strong σ donor and good π acceptor properties of chlorine.

C. Good π donor properties of chlorine.

D. Larger size of chlorine than H_2O.

Answer: C

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22. The magnitude of crystal field stabilisation energy (CFSE or Δ_t) in tetrahedral complexes is considerably less than in the octahedral field. Because

A. There are only 4 ligands instead of six. So the ligand field in only 2/3 the size, hence Δ_t is only 2/3 the size.

B. the direction of orbitals does not coincide with the direction of the ligands. This reduces the crystal field stabilisation energy (Δ_t) by further 2/3.

C. both (a) and (b) are correct

D. both (a) and (b) are wrong.

Answer: C

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23. Which of the following complex ions is expected to absorb visible light?

A. $\left[Ti(en)_2(NH_3)_2\right]^{+4}$

B. $\left[Cr(NH_3)_6\right]^{+3}$

C. $\left[Zn(NH_3)_6\right]^{+2}$

D. $\left[SC(H_2O)_3(NH_3)_3\right]^{+3}$

Answer: B

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24. Which of the following is high spin complex?

A. $[CoCl_6]^{-3}$

B. $[FeF_6]^{-3}$

C. $\left[Co(NH_3)_6\right]^{+2}$

D. All of these

Answer: D

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25. Which one of the following ligand is capable of forming a low spin as well as high spin complex?

A. CO

B. F^{-}

C. NH_3

D. CN^{-}

Answer: C

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26. Complexes with halide ions are generally:

A. low spin complexes

B. high spin complexes

C. both (a) and (b)

D. neither (a) and (b)

Answer: B

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27. Which of the following shall form an octahedral complex?

A. d^4 (low spin)

B. d^8 (high spin)

C. d^6 (low spin)

D. All of these

Answer: C

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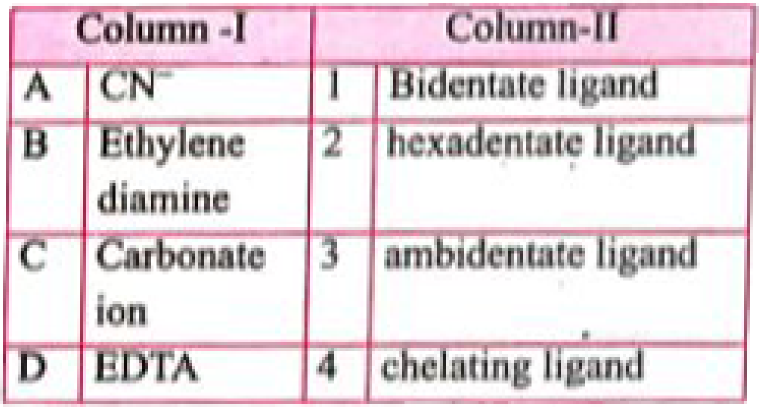
28. Match the entities of column I with appropriate entities of column II .



Column -I		Column-II	
A	CN^-	1	Bidentate ligand
B	Ethylene diamine	2	hexadentate ligand
C	Carbonate ion	3	ambidentate ligand
D	EDTA	4	chelating ligand

A. A-3,B-4,C-1,D-2

B. A-4,B-1,C-2,D-3

C. A-4,B-1,C-3,D-2

D. A-2,B-4,C-1,D-3

Answer: A

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29. Assertion (A): The complex $\left[Co(NH_3)_3Cl_3\right]$ does not give precipitate with $AgNO_3$.

Reason (R): The complex does counter ions.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: A

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30. Assertion (A): The $\left[Ni(en)_3\right]Cl_2$ (en= ethylene diamine) has lower stability than

$\left(Ni(NH_3)_6\right)$.

Reason (R): In $\left[Ni(en)_3\right]Cl_2$, the geometry of nickel is trigonal bipyramidal.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true, but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

Answer: D

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Other Important Question Answer Answer The Following

1. What is the coordination number of the central metal ions in the following complexes ?

$\left[Cu(NH_3)_4\right]^{+2}$

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2. What is the coordination number of the central metal ions in the following complexes ?

$\left[Fe(C_2O_4)_3\right]^{-3}$

View Text Solution

3. What is the coordination number of the central metal ions in the following complexes ?

$\left[Pt(en)_2Cl_2\right]$

View Text Solution

4. What is the coordination number of the central metal ions in the following complexes ?

$[Mo(CN)_8]^{-4}$

View Text Solution

5. What is the coordination number of the central metal ions in the following complexes ?

$Fe[EDTA]^{-}$

View Text Solution

6. What is the coordination number of the central metal ions in the following complexes ?

$\left[Pd(H_2O)_2(ONO)_2I_2\right]$

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7. Calculate the oxidation state, of the central metal atom, in the following :

$\left[Co(NH_3)_5Cl\right]^{+2}$

View Text Solution

8. Calculate the oxidation state, of the central metal atom, in the following :

$K_4[Fe(CN)_6]$

View Text Solution

9. Calculate the oxidation state, of the central metal atom, in the following :

$[Co(NO_2)_2(Py)_2(NH_3)_2]NO_3$

View Text Solution

10. Calculate the oxidation state, of the central metal atom, in the following :

$Ni[CO]_4$

View Text Solution

11. Calculate the oxidation state, of the central metal atom, in the following :

$[Fe(EDTA)]^{-}$

View Text Solution

12. Give the IUPAC names of the following compounds :

$K_3[Al(C_2O_4)_3]$

View Text Solution

13. Give the IUPAC names of the following compounds :

$[Pt(NH_3)_4(NO_2)Cl]SO_4$

View Text Solution

14. Give the IUPAC names of the following compounds :

$K_3[Cr(CN)_6]$

View Text Solution

15. Give the IUPAC names of the following compounds :

$[Co(NH_3)_5ONO]Cl_2$

View Text Solution

16. Give the IUPAC names of the following compounds :

$[Cr(NH_3)_5CO_3]Cl$

View Text Solution

17. Give the IUPAC names of the following compounds :

$[Cr(NH_3)_5(NCS)][ZnCl_4]$

View Text Solution

18. Give the IUPAC names of the following compounds :

$K\left[Au(CN)_2\right]$

View Text Solution

19. Write the formula of following coordination compounds.

Tetraammine diaqua cobalt (III) chloride.

View Text Solution

20. Write the formula of following coordination compounds.

Potassium tetracyanonickelate (II).

View Text Solution

21. Write the formula of following coordination compounds.

Tris (ethane 1, 2, diamine) chromium (III) chloride.

View Text Solution

22. Write the formula of following coordination compounds.

Amminebromidochloridonitrito-N-platinate (III).

View Text Solution

23. Write the formula of following coordination compounds.

Dichlorido bis (ethane 1, 2, diamine) platinum (IV) nitrate.

View Text Solution

24. Write the formula of following coordination compounds.

Iron (111) hexacyanoferrate (III).

View Text Solution

25. Write the IUPAC names of the following coordination compounds :

$[Co(NH_3)_6]Cl_3$

View Text Solution

26. Write the IUPAC names of the following coordination compounds :

$[Co(NH_3)_5Cl]Cl_2$

View Text Solution

27. Write the IUPAC names of the following coordination compounds :

$K_3[Fe(CN)_6]$

View Text Solution

28. Write the IUPAC names of the following coordination compounds :

$K_3[Fe(C_2O_4)_3]$

View Text Solution

29. Write the IUPAC names of the following coordination compounds :

$K_2[PdCl_4]$

View Text Solution

30. Write the IUPAC names of the following coordination compounds :

$Pt\left[(NH_3)_2Cl(NH_2CH_3)\right]Cl$

View Text Solution

31. Using IUPAC names, write the formula of the following:

Tetra hydrazozincate (II)

View Text Solution

32. Using IUPAC names, write the formula of the following:

Hexammine cobalt (III) sulphate.

▶ View Text Solution

33. Using IUPAC names, write the formula of the following:

Potassium trioxalato chromate (III)

▶ View Text Solution

34. Using IUPAC names, write the formula of the following:

Diammine dichloro platinum (II)

View Text Solution

35. Using IUPAC names, write the formula of the following:

Tetra bromido cuprate (II)

View Text Solution

36. Using IUPAC names, write the formula of the following:

Pentaamminenitrito-O-cobalt(III)

View Text Solution

37. Using IUPAC names, write the formula of the following:

Pentaamminenitrito-N-cobalt (III)

View Text Solution

38. Specify the oxidation numbers of the metal ions in the following co-ordination entities.

$[Co(H_2O)(CN)(en)_2]^{+2}$

View Text Solution

39. Specify the oxidation numbers of the metal ions in the following co-ordination entities.

$[PtCl_4]^{-2}$

View Text Solution

40. Specify the oxidation numbers of the metal ions in the following co-ordination entities.

$[Cr(NH_3)_3Cl_3]$

View Text Solution

41. Specify the oxidation numbers of the metal ions in the following co-ordination entities.

$[CoBr_2(en)_2]^+$

View Text Solution

42. Specify the oxidation numbers of the metal ions in the following co-ordination entities.

$K_3[Fe(CN)_6]$

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43. Aqueous copper sulphate (blue in colour) gives a green precipitate with aqueous potassium fluoride. Explain these experimental results.

View Text Solution

44. Aqueous copper sulphate (blue in colour) gives and (ii) a bright green solution with aqueous potassium chloride. Explain these experimental results.

View Text Solution

45. Give two examples for each of the following :

Cationic complex

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46. Give two examples for each of the following :

Anionic complex

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47. Give two examples for each of the following :

Neutral complex

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48. What are homoleptic and heteroleptic complexes? Give one example for each.

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49. Identify the following complexes homoleptic or heteroleptic complexes.

$\left[Fe(CN)_6\right]^{-4}$

View Text Solution

50. Identify the following complexes homoleptic or heteroleptic complexes.

$\left[Co(NH_3)_4Cl_2\right]^{+}$

View Text Solution

View Text Solution

51. Identify the following complexes homoleptic or heteroleptic complexes.

$[Cr(en)_3]^{+3}$

View Text Solution

52. Identify the following complexes homoleptic or heteroleptic complexes.

$[Ag(NH_2)_2]^{+}$

View Text Solution

53. Identify the following complexes homoleptic or heteroleptic complexes.

$[Fe(CN)_5NO]^{-3}$

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54. Explain the following giving an example in each case:

Linkage isomerism

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55. Explain the following giving an example in each case:

Coordination isomerism

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56. Explain the following giving an example in each case:

Ionisation isomerism

View Text Solution

57. Explain the following giving an example in each case:

Solvate or hydrate isomerism.

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58. Give the ionisation isomer of the following and write their IUPAC names.

$[Pt(NH_3)_4Cl_2]Br_2$

View Text Solution

59. Give the ionisation isomer of the following and write their IUPAC names.

$[Co(NH_3)_4Cl_2]NO_2$

View Text Solution

60. Briefly outline the geometrical isomerism exhibited by square planar and with an example.

View Text Solution

61. Write the structure of geometrical isomers in octahedral complexes of the type $Ma_4b_2, Ma_2b_4, Ma_2bc, Ma_3b_3$ where a +b are monodentate ligands. Give example for each type.

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62. Mention the types of stereoisomerism exhibited by coordination compounds.

View Text Solution

63. Explain the geometrical isomerism exhibited by the $[MA_3B_3]^{\pm n}$ where A and B are monodentate ligands.

View Text Solution

64. Explain the terms facial and meritorial isomers

View Text Solution

65. Write the formula of coordination isomers of the following. Write their IUPAC names.

$[Pt(NH_3)_4][CuCl_4]$

View Text Solution

66. Write the formula of coordination isomers of the following. Write their IUPAC names.

$[Cr(NH_3)_6][Co(C_2O_4)_3]$

View Text Solution

67. Write the formula of coordination isomers of the following. Write their IUPAC names.

$[Cr(NH_3)_6][Cr(SCN)_6]$

View Text Solution

68. Write the formula of coordination isomers of the following. Write their IUPAC names.

$Co(en)_3[Cr(CN)_6]$

View Text Solution

69. Discuss the bonding in metal carbonyls.

View Text Solution

70. Indicate the type of isomerism exhibited by the following complexes and draw structures for these isomers.

$KCr(H_2O)_3(C_2O_4)_3$

View Text Solution

71. Indicate the type of isomerism exhibited by the following complexes and draw structures for these isomers.

$\left[Co(en)_3\right]Cl_3$

View Text Solution

72. Indicate the type of isomerism exhibited by the following complexes and draw structures for these isomers.

$\left[Co(NH_3)_5(NO_2)(NO_3)_2\right]$

View Text Solution

73. Indicate the type of isomerism exhibited by the following complexes and draw structures for these isomers.

$[Pt(NH_3)(H_2O)Cl_2]$

View Text Solution

74. Give evidence to show that $[Co(NH_3)_5Cl]SO_4$ and $[Co(NH_3)_5SO_4]Cl$ are ionisation isomers.

View Text Solution

View Text Solution

75. Draw the structure of optical isomers of $PtCl_2(en)_2$

▶ View Text Solution

76. Draw the structure of optical isomers of $\left[Cr(NH_3)_2Cl_2(en)_2\right]^+$

▶ View Text Solution

77. Write all the geometrical isomers of $[Pt(NH_3)BrClPy]$ and how many of these exhibit optical isomerism ?

▶ View Text Solution

78. Draw the structure of all isomers (geometrical and optical) of $\left[Co(NH_3)Cl(en)_2\right]^{+2}$

▶ View Text Solution

79. Draw the structure of all isomers (geometrical and optical) of $\left[Co(NH_3)_2Cl_2(en)\right]^+$

View Text Solution

80. Draw the structure of geometrical isomers of $\left[Fe(NH_3)_2(CN)_4\right]^-$

View Text Solution

81. Out of the following two coordination entities which is optically active ?

(i) $cis\left[CrCl_3(oX)_2\right]^{-3}$ (ii)trans $\left[CrCl_2(oX)_2\right]^{-3}$

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82. Write the structures of isomers , if any and write the names of the following complexes.

$\left[Cr(NH_3)_4Cl_2\right]^{+}$

View Text Solution

83. Write the structures of isomers , if any and write the names of the following complexes.

$\left[Co(en)_3\right]^+$

View Text Solution

84. Platinum (II) forms square planar complexes and platinum (IV) gives octahedral complexes. How many geometrical isomers are possible for each of the following. Draw their structures.

$\left[Pt(NH_3)_3Cl\right]^+$

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85. Platinum (II) forms square planar complexes and platinum (IV) gives octahedral complexes. How many geometrical isomers are possible for each of the following. Draw their structures.

$[Pt(NH_3)Cl_5]^-$

View Text Solution

86. Platinum (II) forms square planar complexes and platinum (IV) gives octahedral complexes. How many geometrical isomers are possible for each of the following. Draw their structures.

$[Pt(NH_3)_2ClNO_2]$

View Text Solution

87. Platinum (II) forms square planar complexes and platinum (IV) gives octahedral complexes. How many geometrical isomers are possible for each of the following. Draw their structures.

$[Pt(NH_3)_4ClBr]^{+2}$

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88. Explain the term inner orbital complex with an example of each

View Text Solution

89. Explain the term outer orbital complex with an example of each

View Text Solution

90. $[Co(CN)_6]^{-3}$ and $[CoF_6]^{-3}$ are both octahedral complexes . Then what is the difference between the two ?

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91. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory .

$\left[Fe(CN)_6\right]^{-4}$

View Text Solution

92. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory .

$[FeF_6]^{-3}$

View Text Solution

93. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory .

$[Co(C_2O_4)_3]^{-3}$

View Text Solution

94. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory .

$[NiCl_4]^{-2}$

View Text Solution

95. $[NiCl_4]^2$ is paramagnetic while $Ni(CO)_4$ is diamagnetic through both are tetrahedral why ?

View Text Solution

96. Explain $\left[Co(NH_3)_6\right]^{+3}$ is an inner orbital complex whereas $\left[Ni(NH_3)_6\right]^{+2}$ is an outer orbital complex.

View Text Solution

97. $\left[Cr(NH_3)_6\right]^{+3}$ is paramagnetic while $\left[Ni(CN)_4\right]^{-2}$ is diamagnetic explain why ?

View Text Solution

98. A solution of $\left[Ni(H_2O)_6\right]^{+2}$ is green but a solution of $\left[Ni(CN)_4\right]^{-2}$ is colourless explain.

View Text Solution

99. $\left[Fe(CN)_6\right]^{-4}$ and $\left[Fe(H_2O)_6\right]^{+2}$ are of different colours in dilute solution why ?

View Text Solution

100. Write down the IUPAC name of the each of the following complexes and indicate the oxidation state, electronic configuration and coordination number of the central metal ion. Also give the stereochemistry and magnetic moment of each complex.

$K_4\left[Cr(H_2O)_2(C_2O_4)_2\right]$

View Text Solution

101. Write down the IUPAC name of the each of the following complexes and indicate the oxidation state, electronic configuration and coordination number of the central metal ion. Also give the stereochemistry and magnetic moment of each complex.

$[CrCl_3(Py_3)]$

View Text Solution

102. Write down the IUPAC name of the each of the following complexes and indicate the oxidation state, electronic configuration and coordination number of the central metal ion. Also give the stereochemistry and magnetic moment of each complex.

$K_2[Mn(CN)_4]$

View Text Solution

View Text Solution

103. Write down the IUPAC name of the each of the following complexes and indicate the oxidation state, electronic configuration and coordination number of the central metal ion. Also give the stereochemistry and magnetic moment of each complex.

$[Co(NH_3)_5Cl]Cl_2$

View Text Solution

104. Write down the IUPAC name of the each of the following complexes and indicate the oxidation state, electronic configuration and coordination number of the central metal ion. Also give the stereochemistry and magnetic moment of each complex.

$CS[FeCl_4]$

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105. Calculate the magnetic moment of the following coordination entities .

$\left[Cr(H_2O)_6\right]^{+3}$

View Text Solution

106. Calculate the magnetic moment of the following coordination entities .

$\left[Fe(H_2O)_6\right]^{+3}$

View Text Solution

107. Calculate the magnetic moment of the following coordination entities .

$\left[Zn(H_2O)_6\right]^{+2}$

View Text Solution

108. What will be the correct order for the wave length of absorption in the visible region of the following:

$\left[Ni(NO_2)_6\right]^{-4}, \left[Ni(NH_3)_6\right]^{+2}, \left[Ni(H_2O)_6\right]^{+2}$

View Text Solution

109. Give the number of unpaired electrons in the following complex ions: $[FeF_6]^{-4}$

View Text Solution

110. Give the number of unpaired electrons in the following complex ions: $\left[Fe(CN)_6\right]^{-4}$

View Text Solution

111. Explain as how two complexes $\left[Ni(CN)_4\right]^{-2}$ and $\left[Ni(CO)_4\right]$ have different structures but do not differ in their magnetic behaviour. (Ni-28)

View Text Solution

112. Using valence bond theory explain $\left[Co(NH_3)_6\right]^{+3}$ in relation to the complex given below:

type of hybridisation

$\left[Co(NH_3)_6\right]^{+3} : Co^{+3} = d^6$ configuration

View Text Solution

113. Using valence bond theory explain $\left[Co(NH_3)_6\right]^{+3}$ in relation to the complex given below:

inner or outer orbital complex

View Text Solution

114. Using valence bond theory explain $\left[Co(NH_3)_6\right]^{+3}$ in relation to the complex given below:

magnetic behaviour

View Text Solution

115. Using valence bond theory explain $\left[Co(NH_3)_6\right]^{+3}$ in relation to the complex given below:

spin only magnetic moment value

View Text Solution

116. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory.

$\left[Fe(CN)_6\right]^{-4}$

View Text Solution

117. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory.

$\left[FeF_6\right]^{2-}$

View Text Solution

118. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory.

$\left[Co(C_2O_4)_3\right]^{-3}$

View Text Solution

119. Discuss the nature of bonding in the following coordination entities on the basis of valence bond theory.

$[COF_6]^{-3}$

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120. What are crystal fields?

View Text Solution

121. What do you understand by the term crystal field splitting?

View Text Solution

122. Briefly discuss the crystal field splitting in octahedral complexes.

View Text Solution

123. For the complex

$\left[Fe(on)_2Cl_2\right]Cl$ (en=ethylene diamine) ,

identify The complex is $\left[Fe(en)_2Cl_2\right]Cl$.

The oxidation number of Fe .

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124. For the complex

$\left[Fe(on)_2Cl_2\right]Cl$ (en=ethylene diamine) , identify The complex is $\left[Fe(en)_2Cl_2\right]Cl$.

The hybrid orbital and shape of the complex.

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125. For the complex

$\left[Fe(on)_2Cl_2\right]Cl$ (en=ethylene diamine) ,

identify The complex is $\left[Fe(en)_2Cl_2\right]Cl$.

The magnetic behaviour of the complex.

View Text Solution

126. For the complex

$\left[Fe(on)_2Cl_2\right]Cl$ (en=ethylene diamine) , identify The complex is $\left[Fe(en)_2Cl_2\right]Cl.$

The number of geometrical isomers.

View Text Solution

127. For the complex

$\left[Fe(on)_2Cl_2\right]Cl$ (en=ethylene diamine) , identify The complex is $\left[Fe(en)_2Cl_2\right]Cl.$

Whether there is an optical isomer also.

View Text Solution

128. For the complex

$\left[Fe(on)_2Cl_2\right]Cl$ (en=ethylene diamine) ,

identify The complex is $\left[Fe(en)_2Cl_2\right]Cl$.

The name of the complex (At. No of Fe^{-} 26)

View Text Solution

129. Compare the following complexes with respect to their shape , magnetic behaviour and the hybrid orbitals involved.

(i)$[CoF_4]^{-2}$, (ii)$\left[Cr(H_2O)_2(C_2O_4)_2\right]$, (iii) $\left[Ni(Co)_4\right]$. (At No: Co=27, Cr=24 , Ni=28)

View Text Solution

130. Briefly discuss the crystal field splitting in octahedral complexes.

View Text Solution

131. Briefly outline crystal field splitting in square planar complexes.

View Text Solution

132. What is crystal field splitting energy ? How does the magnitude of Δ_0 decide the actual configuration of 'd' orbitals in a coordination entity ?

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133. What is spectro chemical series ? Explain the difference between a weak field ligand and a strong field ligand.

View Text Solution

134. How does the oxidation state of a metal ion influence or affect of crystal field splitting energy ?

View Text Solution

135. Briefly explain the distribution of 'd' electrons in t_{2g} and e_g orbitals in octahedral complexes in a weak ligand field.

View Text Solution

136. The hexa aqua manganese (II) ions contains five unpaired electrons while hexacyano ions contain only one unpaired electron. Explain using crystal field theory .

View Text Solution

137. Why do compounds having similar geometry have different magnetic moment ?

View Text Solution

138. Briefly explain how the electrons are distributed between t_{2g} and e_g sets in an octahedral complex in the presence of a stong field ligand.

View Text Solution

139. Using crystal field theory , draw energy level diagram of the central metal atom/ion and determine the magnetic moment value of the following.

$[COF_6]^{-3}$

View Text Solution

140. Using crystal field theory , draw energy level diagram of the central metal atom/ion and determine the magnetic moment value of the following.

$\left[Co(H_2O)_6\right]^{+2}$

View Text Solution

141. Using crystal field theory , draw energy level diagram of the central metal atom/ion and determine the magnetic moment value of the following.

$$\left[Cu(CN)_6\right]^{-3}$$

View Text Solution

142. In the basis of crystal field theory explain why cobalt (III) forms paramagnetic octahedral complex with weak field ligands whereas it forms diamagnetic octahedral complex with strong field ligands.

View Text Solution

143. Differentiate between weak field and strong field coordination entity .

View Text Solution

144. State for a d^6 configuration , how the actual configuration of the split 'd' orbitals in an octahedral field is decided by relative values of Δ_0 and P.

View Text Solution

145. Arrange the following ligands in the increasing order of crystal field splitting power.

H_2O, OH, Cl, F, CN

View Text Solution

146. Using crystal field theory , show energy level diagrams, write the electronic configuration of the central metal atom/ion and determine the magnetic moment value in the following .

$[FeF_6]^{-3}$

View Text Solution

147. Using crystal field theory , show energy level diagrams, write the electronic configuration of the central metal atom/ion and determine the magnetic moment value in the following .

$[Fe(H_2O)_6]^{+2}$

View Text Solution

148. Using crystal field theory , show energy level diagrams, write the electronic configuration of the central metal atom/ion and determine the magnetic moment value in the following .

$\left[Fe(CN)_6\right]^{-4}$

▶ View Text Solution

149. Give the oxidation state, 'd' orbital occupation and coordination number of the central metal ion in the following complexes.

(i)$K_3\left[Co(C_2O_4)_3\right]$,(ii)$(NH_4)\left[CoF_4\right]$, (iii) $Cis-\left[Cr(en)_2Cl_2\right]Cl$, (iv)$\left[Mn(H_2O)_6\right]SO_4$.

▶ View Text Solution

150. With the help of crystal field theory , product the number of unpaired electron in $\left[Fe(CN)_6\right]^{-4}$ and $\left[Fe(H_2O)_6\right]^{+2}$ complexes.

View Text Solution

151. CO is stronger ligand than NH_3 for many metals. Explain giving appropriate reason.

View Text Solution

152. What is meant by stability of a coordination compound in solution ?

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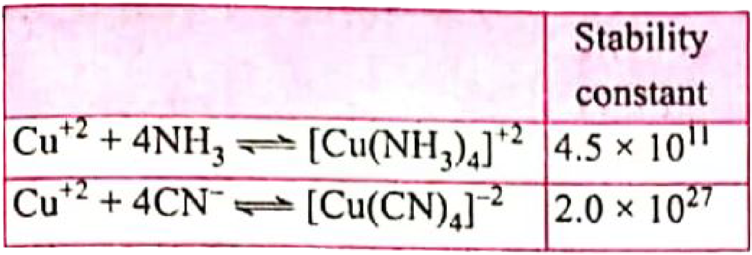
153. The stability constant of some complexes are given below:



	Stability constant
$Cu^{+2} + 4NH_3 \rightleftharpoons [Cu(NH_3)_4]^{+2}$	4.5×10^{11}
$Cu^{+2} + 4CN^- \rightleftharpoons [Cu(CN)_4]^{-2}$	2.0×10^{27}

Among CN^- and NH_3 which is a stronger ligand ? Why ?

View Text Solution

154. The dissociation constants of $\left[Cu(NH_3)_4\right]^{+2}$ and $\left[Co(NH_3)_6\right]^{+3}$ are 1.10×10^{-12} and 6.2×10^{-36} respectively . Which complex would be more stable and why ?

View Text Solution

155. Calculate the over all complex dissociation equilibrium constant for the $\left[Cu(NH_3)_4\right]^{+2}$

ion given that β_4 for this complex is 2.14×10^{13}

.

▶ View Text Solution

156. Calculate the ratio of $\left[Ag(S_2O_3)_2\right]^{-3}$ and $\left[Ag^+\right]$ in 0.1 M S_2O_3 solution. Given the stability or formation constant of $\left[Ag(S_2O_3)_2\right]^{-3}$ is 1.0×10^{13}.

▶ View Text Solution

157. Mention the use of coordination compounds in metallurgy.

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158. Mention the use of complexes used as catalyst in organic reactions.

View Text Solution

159. Mention the use of complexes in photography .

View Text Solution

160. Mention the use of metal complexes in biological systems.

View Text Solution

161. What is Cisplatin ? Mention its use.

View Text Solution

162. What are metal carbonyls ? Mention their uses.

▶ View Text Solution

163. What are mononuclear and poly nuclear carbonyls ? Give examples .

▶ View Text Solution

164. What are non bridged metal carbonyls ? Give examples.

View Text Solution

165. What are bridged carbonyls ? Give example .

View Text Solution