HIGHER SECONDARY SECOND YEAR CHEMISTRY

UNIT 5 COORDINATION CHEMISTRY

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

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) $\left[M(H_2O)_4Cl\right]SO_4.2H_2O$ b) $\left[M(H_2O)_6\right]SO_4$

   c) $\left[M(H_2O)_5Cl\right]SO_4.H_2O$ d) $\left[M(H_2O)_3Cl\right]SO_4.3H_2O$

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

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 κ-Ocobaltate(III) chloride

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

   d) chloridobis(ethane-1,2-diammine)nitrito κ -Ocobalt(III)chloride

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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) potassiumtrioxalatoaluminate(III)

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

a) $TiCl_4$ b) $[CoCl_6]^{4-}$

c) $\left[Cu(NH_3)_4\right]^{2+}$ d) $\left[Ni(CN)_4\right]^{2-}$

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) $\left[Co(CN)_6\right]^{3-}$ b) $\left[Co(C_2O_4)_3\right]^{3-}$

c) $\left[Co(H_2O)_6\right]^{3+}$ d) $\left[Co(NH_3)_6\right]^{3+}$

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

a) $\left[Cr(NH_3)_6\right]\left[Co(CN)_6\right]$ b) $\left[Co(en)_2Cl_2\right]Cl$

c) $\left[Pt(NH_3)_4\right]\left[PtCl_4\right]$ d) $\left[Co(NH_3)_4Cl_2\right]NO_2$

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

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

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

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

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

b) $\left[Co(NH_3)_5(NO_3)\right]SO_4$ and $\left[Co(NH_3)_5(ONO)\right]$

c) $\left[Co(NH_3)_4(NCS)_2\right]Cl$ and $\left[Co(NH_3)_4(SCN)_2\right]Cl$

d) both (b) and (c)

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14. Which kind of isomerism is possible for a complex $\left[Co(NH_3)_4 Br_2\right]Cl$?

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) $\left[Ni(NH_3)_4(H_2O)_2\right]^{2+}$
b) $\left[Pt(NH_3)_2 Cl_2\right]$
c) $\left[Co(NH_3)_5 SO_4\right]Cl$
d) $\left[FeCl_6\right]^{3-}$

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

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

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

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

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

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) $\left[Co(NH_3)_5 Cl\right]SO_4$

20. Choose the correct statement.

a) Square planar complexes are more stable than octahedral complexes
b) The spin only magnetic moment of $\left[Cu(Cl)_4\right]^{2-}$ is 1.732 BM and it has square planar structure.
c) Crystal field splitting energy (Δ_0) of $\left[FeF_6\right]^{4-}$ 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 $\left[Ti(H_2O)_6\right]^{2+}$

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