Coordination Compounds

Q.No.1:
Which of the following complex species is not expected to exhibit optical isomerism?

JEE 2013

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

B. $[Co(en)_2\ Cl_2]^{+}$

C. $[Co(NH_3)_3\ Cl_3]$

D. $[Co(en)(NH_3)_2\ Cl_2]^{+}$

Q.No.2: The octahedral complex of a metal iron M^{3+} with four monodentate ligands L_1, L_2, L_3 and L_4 absorbs wavelengths in the region of red, green, yellow and blue, respectively. The increasing order of ligand strength of the four ligands is

A. $L_3 < L_2 < L_4 < L_1$

B. $L_1 < L_2 < L_4 < L_3$

C. $L_4 < L_3 < L_2 < L_1$

D. $L_1 < L_3 < L_2 < L_4$

Q.No.3: The number of geometric isomers that can exist for square planar $[Pt(Cl)(py)(NH_3)(NH_2OH)]^{+}$ is (py = pyridine) : **JEE 2015**

A. 2

B. 3

C. 4

D. 6

Q.No.4: The color of $KMnO_4$ is due to: **JEE 2015**

A. M → L charge transfer transition

B. d → d transition

C. L → M charge transfer transition

D. σ − σ* transition

Q.No.5: Which of the following compounds is **not** colored yellow? **JEE 2015**

A. $Zn_2[Fe(CN)_6]$

B. $K_3[Co(NO_2)_6]$

C. $(NH_4)_3$ [As $(Mo_3\ O_{10})_4$]

D. $BaCrO_4$

Q.No.6: The pair having the same magnetic moment is : [At.No.: Cr = 24, Mn = 25, Fe = 26, Co = 27] **JEE 2016**

A. $[Cr(H_2O)_6]^{2+}$ and $[Fe(H_2O)_6]^{2+}$

B. $[Mn(H_2O)_6]^{2+}$ and $[Cr(H_2O)_6]^{2+}$

C. $[CoCl_4]^{2-}$ and $[Fe(H_2O)_6]^{2+}$

D. $[Cr(H_2O)_6]^{2+}$ and $[CoCl_4]^{2-}$

Q.No.7: Which one of the following complexes shows optical isomerism? **JEE 2016**

A. *cis* $[Co(en)_2Cl_2]Cl$

B. *trans* $[Co(en)_2Cl_2]Cl$

C. $[Co(NH_3)_4Cl_2]Cl$

D. $[Co(NH_3)_3Cl_3]$

Q.No.8: Consider the following reaction and statements :

$$\left[\mathrm{Co\,(NH_3)_4\,Br_2}\right]^{+} + \mathrm{Br^{-}} \rightarrow \left[\mathrm{Co\,(NH_3)_3\,Br_3}\right] + \mathrm{NH_3}$$

(I) Two isomers are produced if the reactant complex ion is a *cis*-isomer.
(II) Two isomers are produced if the reactant complex ion is a *trans*-isomer.
(III) Only one isomer is produced if the reactant complex ion is a *trans*-isomer.
(IV) Only one isomer is produced if the reactant complex ion is a *cis*-isomer.
The correct statements are : **JEE 2018**

A. (III) and (IV)

B. (II) and (IV)

C. (I) and (II)
D. (I) and (III)

Q.No.9: Two complexes $[Cr(H_2O)_6]Cl_3$ (A) and $[Cr(NH_3)_6]Cl_3$ (B) are violet and yellow coloured, respectively. The incorrect statement regarding them is:

JEE 2019

A. Δ_0 values (A) and (B) are calculated from the energies of violet and yellow light, respectively.
B. both absorb energies corresponding to their complementary colors.
C. both are paramagnetic with three unpaired electrons.
D. Δ_0 value for (A) is less than that of (B).

Q.No.10: The highest value of the calculated spin-only magnetic moment (in BM) among all the transition metal complexes is: **JEE 2019**

A. 5.92
B. 6.93
C. 3.87
D. 4.90