



## Coordination Compounds

**Q.No.1:**

Which of the following complex species is not expected to exhibit optical isomerism?

**JEE 2013**

- A.  $[\text{Co}(\text{en})_3]^{3+}$
- B.  $[\text{Co}(\text{en})_2 \text{Cl}_2]^+$
- C.  $[\text{Co}(\text{NH}_3)_3 \text{Cl}_3]$
- D.  $[\text{Co}(\text{en})(\text{NH}_3)_2 \text{Cl}_2]^+$

**Q.No.2:** The octahedral complex of a metal iron  $\text{M}^{3+}$  with four monodentate ligands  $\text{L}_1$ ,  $\text{L}_2$ ,  $\text{L}_3$  and  $\text{L}_4$  absorbs wavelengths in the region of red, green, yellow and blue, respectively. The increasing order of ligand strength of the four ligands is

- A.  $\text{L}_3 < \text{L}_2 < \text{L}_4 < \text{L}_1$
- B.  $\text{L}_1 < \text{L}_2 < \text{L}_4 < \text{L}_3$
- C.  $\text{L}_4 < \text{L}_3 < \text{L}_2 < \text{L}_1$
- D.  $\text{L}_1 < \text{L}_3 < \text{L}_2 < \text{L}_4$

**Q.No.3:** The number of geometric isomers that can exist for square planar  $[\text{Pt}(\text{Cl})(\text{py})(\text{NH}_3)(\text{NH}_2\text{OH})]^+$  is (py = pyridine) :

**JEE 2015**

- A. 2
- B. 3
- C. 4
- D. 6

**Q.No.4:** The color of  $\text{KMnO}_4$  is due to:

**JEE 2015**

- A.  $M \rightarrow L$  charge transfer transition
- B.  $d \rightarrow d$  transition
- C.  $L \rightarrow M$  charge transfer transition
- D.  $\sigma - \sigma^*$  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**

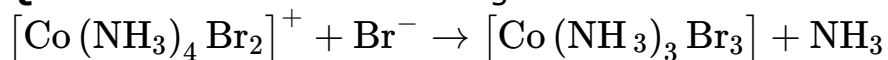
- A.  $[Cr(H_2O)_6]^{2+}$  and  $[Fe(H_2O)_6]^{2+}$
- B.  $[Mn(H_2O)_6]^{2+}$  and  $[Cr(H_2O)_6]^{2+}$
- C.  $[CoCl_4]^{2-}$  and  $[Fe(H_2O)_6]^{2+}$
- D.  $[Cr(H_2O)_6]^{2+}$  and  $[CoCl_4]^{2-}$

**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 :



- (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  $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$  (A) and  $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$  (B) are violet and yellow coloured, respectively. The incorrect statement regarding them is:

**JEE 2019**

- A.  $\Delta_0$  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.  $\Delta_0$  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