

Topic : Coordination Compounds

Type of Questions

Single choice Objective ('-1' negative marking) Q.1 to Q.4

(3 marks, 3 min.)

M.M., Min.

[12, 12]

Subjective Questions ('-1' negative marking) Q.5 to Q.6

(4 marks, 5 min.)

[8, 10]

Match the Following (no negative marking) Q.7

(8 marks, 10 min.)

[8, 10]

- The IUPAC name for the complex compound $\text{Li}[\text{AlH}_4]$ is :
(A) lithium aluminium hydride (B) hydrido - aluminiumlithium (III)
(C) lithium tetrahydridoaluminate (III) (D) lithium tetrahydridoaluminate (I)
- The IUPAC name for $\text{K}_2[\text{Cr}^{\text{VI}}\text{NH}_3(\text{CN})_2\text{O}_2(\text{O}_2)]$ is
(A) potassium amminedicyanido-C-dioxidoperoxidochromate(VI)
(B) potassium amminedicyanatotetraoxochromium(III)
(C) potassium amminedicyanochromate (IV)
(D) potassium aminocyanodiperoxochromate (VI)
- The IUPAC name for $\text{K}_2[\text{OsCl}_5\text{N}]$ is
(A) potassium pentachloroazidoosmate (VIII) (B) potassium pentachloroazoosmate (VI)
(C) potassium pentachloridonitridoosmate (VI) (D) potassium nitroosmate (III)
- The formula of the complex sodium hydridotrimethoxoborate (III) is
(A) $\text{Na}_4[\text{B}_4\text{H}_2(\text{OCH}_3)_3]$ (B) $\text{Na}_2[\text{BH}(\text{OCH}_3)_3]$ (C) $\text{Na}[\text{BH}_2(\text{OCH}_3)_3]$ (D) $\text{Na}[\text{BH}(\text{OCH}_3)_3]$
- Write IUPAC names of the following
(a) $\text{Na}_2[\text{Fe}(\text{CN})_5\text{NO}]$ (b) $[\text{Ni}(\text{DMG})_2]$
(c) $\text{NH}_4[\text{Cr}(\text{SCN})_4(\text{NO})_2]$ (NO is nitrosyl) (d) $[\text{Pd}(\text{H}_2\text{O})_2\text{I}_2(\text{ONO})_2]$
(e) $[\text{Co}(\text{NH}_3)_4\text{Cl}(\text{NCS})]^+$ (f) $\text{K}_4[\text{FeO}_4]$
(g) $\text{K}_2[\text{Co}(\text{N}_3)_4]$ (h) $[\text{Ni}(\text{PPh}_3)_2\text{Cl}_2]$
(i) $[\text{Cr}(\text{acac})_3]$ (j) $[\text{Pt}(\text{C}_5\text{H}_5\text{N})_4][\text{PtCl}_4]$
- Write the structural formula corresponding to each of the following IUPAC names :
(a) hexaaquairon (II) chloride
(b) potassium tetrafluoroargentate (III)
(c) pentachloridotitanate (II) ion
(d) tetraamminedichloridocobalt (III) chloride
(e) dicyanido-C-argentate (I) ion
(f) diamminetetrachloridonickelate (II) ion
(g) tris(ethylenediamine)copper(II) sulphate
(h) sodium diaquatetrahydroxidoaluminate (III)
(i) amminechloridobis(ethylene diamine)chromium(III) sulphate
(j) potassium tetracyanido-C-zincate (II)
- Match the ligands listed in column – I with the characteristic(s)/type of ligands listed in column – II.

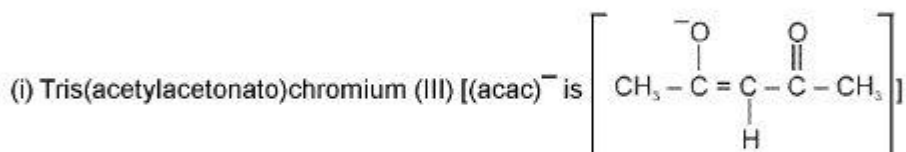
Column – I	Column – II
(A) Acetyl acetonato	(p) Resonance stabilization
(B) Oxalato	(q) Monoanion
(C) Dimethyl glyoximato	(r) Chelating ligand
(D) Nitrito	(s) Ambidentate ligand
	(t) Monodentate

NOTE : For resonance stabilization consider the ligands as only free ions.

Answer Key

DPP No. # 5

1. C 2. A 3. C 4. D
5. (a) Sodium pentacyanido-C-nitrosiumferrate(II) (Sodium nitroprusside-diamagnetic)
 (b) Bis (dimethylglyoximato) nickel (II)
 (c) Ammonium dinitrosyltetrathiocyanato-S chromate (III)
 (d) Diaquadiiododinitrito-O palladium (IV)
 (e) Tetraamminechloridothiocyanato-N cobalt (III) ion
 (f) Potassium tetraoxido-ferrate (IV)
 (g) Potassium tetraazidocobaltate (II) [N_3^- is azide]
 (h) Dichloridobis(triphenylphosphine) nickel (II)



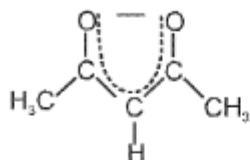
- (j) Tetrakis(pyridine)platinum(II) tetrachloridoplatinate (II)
6. (a) $\text{Fe}^{2+} + 6\text{H}_2\text{O} + \text{Cl}^- \longrightarrow [\text{Fe}(\text{H}_2\text{O})_6]^{2+} \text{Cl}^-$
 Cation is a complex ion and carries + 2 charge, hence its structure is
 $[\text{Fe}^{\text{II}}(\text{H}_2\text{O})_6]\text{Cl}_2$
 Oxidation state of the metal ion has been given in the structure. Students may omit it.
- (b) $\text{K}^+ + \text{Ag}^{3+} + 4\text{F}^- \longrightarrow \text{K}^+ [\text{AgF}_4]^-$
 cation
 anion is a complex $\text{K}^+ [\text{Ag}^{\text{III}}\text{F}_4]^-$
- (c) $[\text{Ti}^{\text{II}}\text{Cl}_5]^{3-}$ (d) $[\text{Co}^{\text{III}}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$
 (e) $[\text{Ag}^{\text{I}}(\text{CN})_2]^-$ (f) $[\text{Ni}(\text{NH}_3)_2\text{Cl}_4]^{2-}$
- (g) $[\text{Cu}^{\text{II}}(\text{en})_3]\text{SO}_4$ (h) $\text{Na}[\text{Al}^{\text{III}}(\text{H}_2\text{O})_2(\text{OH})_4]$
 (i) $[\text{Cr}^{\text{III}}(\text{NH}_3)\text{Cl}(\text{en})_2]\text{SO}_4$ (j) $\text{K}_2[\text{Zn}^{\text{II}}(\text{CN})_4]$
7. (A – p,q,r) ; (B – p,r) ; (C – p,q,r) ; (D – p,q,s,t)

Hints & Solutions

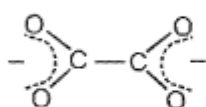
PHYSICAL / INORGANIC CHEMISTRY

DPP No. # 5

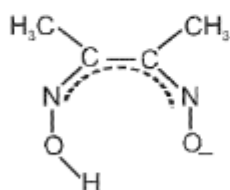
7. (A) Acetyl acetonato ($\text{CH}_3\text{COCHCOCH}_3^-$)



- (B) Oxalato ($\text{C}_2\text{O}_4^{2-}$)



- (C) Dimethylglyoximato ($\text{HONCC}(\text{CH}_3)\text{C}(\text{CH}_3)\text{NO}^-$)



- (D) Nitrito (NO_2^-)

It may link to central metal ion either through nitrogen or oxygen ; so it is ambidentate ligand.

