DPP
DAILY PRACTICE PROBLEMS

Class : XIIth
Date :

Solutions

Subject : CHEMISTRY
DPP No. : 6

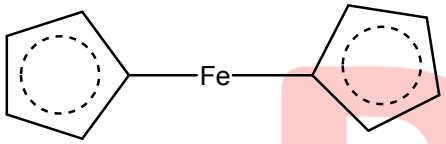
Topic :- Coordination Compounds

2 **(d)**

Ferrocene of bi-(cyclopentadienyl) iron is an orange-crystalline solid. It is $Fe(\eta^5\text{–}C_5H_5)_2$.

The structure of ferrocene is regarded as sandwiche structure, in which the iron atom is sandwiched between two C_5H_5 organic rings. The planes of the rings are parallel so that all the carbon atoms are at the same distance from the iron atom.

It is a π-bonded complex. Its structure is as



3 **(c)**

$[Cu(NH_3)_4]SO_4$

Oxidation number of

$Cu \Rightarrow x + 4 \times 0 - 2 = 0$

$x - 2 = 0$

$x = +2$

O.N of Cu$=+2$

O.N of pt in $[Pt(NH_3)_2Cl_2]$

$x + 2 \times 0 + 2 \times -1 = 0$

$x - 2 = 0$

$x = +2$

O.N of Ni in $[Ni(CO)_4]$

$x + 4 \times 0 = 0$

$x = 0$

O.N of Fe in $K_3[Fe(CN)_6]$

$3 \times (+1) + x + 6 \times -1 = 0$

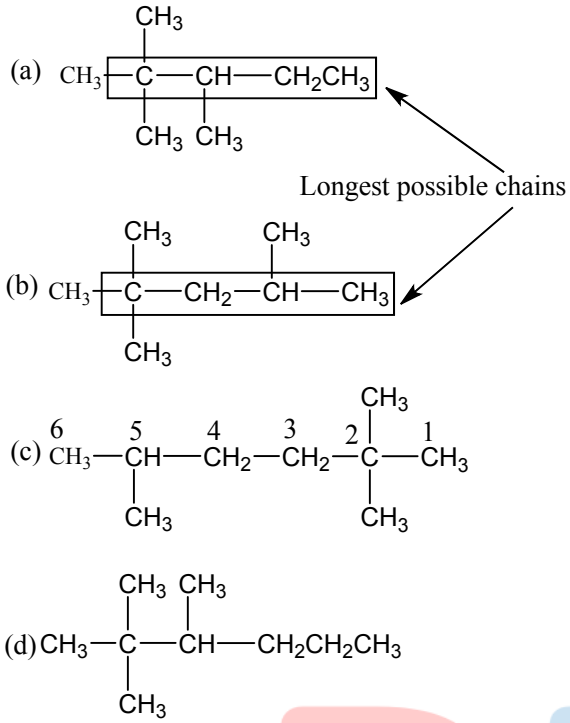
$3 + x - 6 = 0$

$x = +3$

$\therefore [Ni(CO)_4]$ is zero valent compound.

4 **(d)**

The compounds given have following structures



Out of these the (a) and (b) contain 5 C-atoms in their longest possible chains hence, these could not be the correct options for 2, 2, 3-trimethylhexane. Out of (c) and (d), the (c) is 2, 2, 5-trimethyl hexane and (d) is 2, 3, 3-trimethyl hexane

5 **(b)**

Phenoxy benzene is diphenyl ether.

6 **(b)**

Ziegler-Natta catalyst is an organometallic compound containing titanium. It is $TiCl_4$ and $(C_2H_5)_3$ Al. It is used in the preparation of polyethylene.

$$n CH_2 = CH_2 \xrightarrow[TiCl_4 + (C_2H_5)_3Al]{330 - 350\ K,\ 1 - 2\ atm} (-CH_2 - CH_2-)_n$$

polyethylene

7 **(c)**

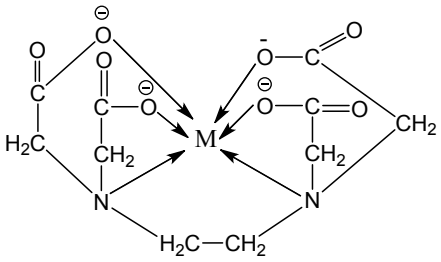
$Al_2(C_2H_5)_6 + TiCl_4$ is Zeigler Natta catalyst.

8 **(c)**

Transition metals have empty or half filled d-orbitals to accept electron pairs.

9 **(d)**

The number of atom of the ligand that are directly bound to the central metal atom or ion by coordinate bonds is known as the coordinate number of the metal or ion. It is actually the number of chemical bonds which the ligand form with the central metal atom or ion

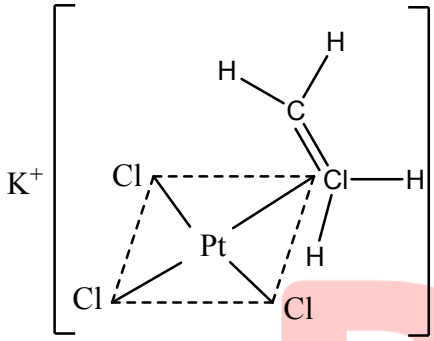


10 **(a)**

Acyl chlorides or acid amhydrides are used in acylation.

12 **(a)**

Zeise's salt, $K[PtCl_3(C_2H_4)]$ is a π-bonded organometallic compound. Its structure is as



15 **(a)**

Follow IUPAC rules.

16 **(c)**

Since the complexes $[PtCl_2(NH_3)_4]Br_2$ and $[PtBr_2(NH_3)4Cl_2$ have the same molecular formula but on ionisation they give different ions, they exhibit ionisation isomerism.

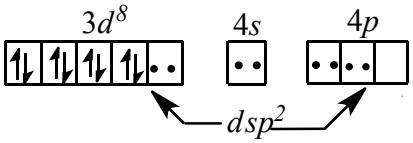
$[PtCl_2(NH_3)_4]Br_2 \rightleftharpoons [PtCl_2(NH_3)_4]^{2+} + 2Br^-$

$[PtBr_2(NH_3)_4]Cl_2 \rightleftharpoons [PtBr_2(NH_3)_4]^{2+} + 2Cl^-$

17 **(b)**

$Ni^{2+} + 4CN^- \rightarrow [Ni(CN)_4]^{2-}$

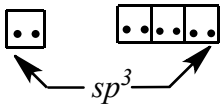
Here Ni^{2+} has d^8-configuration with CN^- as strong ligand.



d^8-configuration in strong ligand field gives dsp^2 hybridisation, hence square planar geometry.

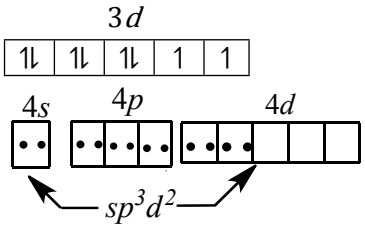
$Ni^{2+} + 4Cl^- \rightarrow [NiCl_4]^{2-}$

Here Ni^{2+} has d^8-configuration with CN^- as weak ligand.



d^8-configuration in weak ligand field gives sp^3 hybridisation, hence tetrahedral geometry.

Ni^{2+} with H_2O forms $[Ni(H_2O)_6]^{2+}$ complex and H_2O is a weak ligand.



Therefore, $[Ni(H_2O)_6]^{2+}$has octahedral geometry.

18 **(c)**

Benzene ring is activates for $S_E$reaction by the $+I$effect as well as hyperconjugation of CH_3 group $-Cl$ deactivates as $-I$ effect predominates over $+M$ effect. $-NO_2$ group deactivates ring by $-I$ effect and $-M$ effect.

20 **(c)**

Alcohols are neutral.

ANSWER-KEY										
Q.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
A.	**D**	**D**	**C**	**D**	**B**	**B**	**C**	**C**	**D**	**A**
Q.	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
A.	**C**	**A**	**C**	**B**	**A**	**C**	**B**	**C**	**B**	**C**