

Roll No.

Total Pages : 6

1782/M

M-35/2051

**CHEMISTRY OF ORGANOMETALLIC
COMPOUNDS**

Paper-411

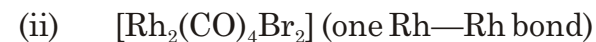
Semester-IV

Time allowed : 3 Hours] [Maximum Marks : 55

Note: The candidates are required to attempt two questions each from section A carrying 8 marks and section B and carrying 8½ marks each the entire Section C consisting of 11 short answer type questions carrying 2 marks each is compulsory.

SECTION-A

1. (a) Write the IUPAC name of the following compounds: 2

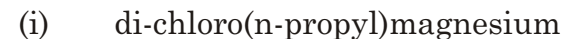


(b) With the help of calculation identify the complexes following inert gas rule. 2



(c) What do you understand by agnostic hydrogen? Explain its effect on the stability of C—H bond. 4

2. (a) Write the correct chemical formula of the following organometallic complexes: 2



(b) Calculate the number of metal—metal bonds in the following complexes: 2



(c) Discuss the preparation and application of aluminohydrides. 4

3. (a) With the help of chemical reactions, give the preparation and properties of transition metal complexes with alkenes and alkynes. 4
- (b) Give the preparation of: 4
- (i) monocyclopentadienyl
- (ii) carbocyclic - complexes.
4. (a) Describe with the help of chemical reactions, how the reaction of C_5H_5 ring in ferrocene will differ from free C_5H_5 group? 4
- (b) Describe the main difference between Fisher and Schrock carbene with the help of chemical equation. 4

SECTION-B

5. (a) Name the catalyst involved in shift reaction and discuss its mode of action. $4\frac{1}{2}$

- (b) With the help of an example, discuss the supported homogeneous catalyst and its advantages over conventional homogeneous catalysts. 4

6. (a) Discuss in detail the mode of action of Wilkinson's catalyst in alkene hydrogenation. $4\frac{1}{2}$

- (b) What do you understand by hydrosilation reaction, explain? 4

7. (a) Discuss the determination of molecular symmetry with the help of IR technique in metal carbonyls. $4\frac{1}{2}$

- (b) What do you understand the metal carbonylate ions, discuss their synthesis with the help of chemical equation involved? 4

8. (a) Explain the photochemical reactions of metal carbonyl complexes, highlighting, their potential applications. $4\frac{1}{2}$

- (b) With the help of chemical reactions, explain the electrophilic attack on CO in metal carbonyls. 4

SECTION-C

9. (i) Give an example of Fischer-Tropsch synthesis.
- (ii) Calculate the number of Os—Os bonds in $\text{Os}_3(\text{CO})_{16}$.
- (iii) What is hydroformylation reaction, explain?
- (iv) Write the chemical equation involved in transfer hydrogenation reaction.
- (v) How will you differentiate between a bridged and terminal carbonyl in metal carbonyls.
- (vi) Give the synthesis of a binuclear metal carbonyl complex?
- (vii) Give the preparation of metal hydrides?

- (viii) Give the synthesis of a complexes involving hydrogen bridge.
- (ix) What do you understand by sandwich compounds, explain with the help of an example?
- (x) What do you understand by fluxional behavior of organometallic complexes?
- (xi) How will you identify the bridging CO group in metal carbonyls?

2×11 = 22