**Assignment-2**

**Class: B. Sc. (Chemistry), 5th Semester, (2023-2024)**

**Subject: (Organometallic Chemistry ) Code: CUTM 1481**

**Last Date of Submission:**

Section A:

1. (i) Which of the following statements about ferrocene is false?

(a) It obeys 18-electron rule

b) It is diamagnetic

(c) It is an orange red solid

(d) It resists electrophilic reaction

(ii) Mannich condensation reaction involves

1. Ferrocene with CH3COCl in the presence of AlCl3
2. Ferrocene with BuLi followed by reaction with N2O4
3. Ferrocene with B(OR)3 followed by hydrolysis
4. Ferrocene with HCHO and amines

(iii) Which one of the following statements is not correct?

1. Mettallocenes with more than 18 outer electrons are less stable than ferrocene
2. Mettallocenes with more than 18 outer electrons are more reactive than ferrocene
3. The outer electrons of ferrocene are arranged in nine bonding and antibonding MOs.
4. Bonds contributing the most of the stability of ferrocene have π-symmetry

(iv) Ferrocene was discovered by

1. Goeffrey
2. Woodward
3. Fischer and Wilkinson
4. None of them

(v) One of the following gives the formula of ferrocene

(a) Fe(CO)10

(b) Fe(C5H5)2

(c) Fe2(CO)9

(d) None of these

(vi) Aluminium trimethyl is

1. A monomer
2. A dimer
3. A polymer
4. None of these

(vii) Choose the correct statement

1. Ferrocene is aromatic in character and more reactive than benzene
2. Ferrocene is aromatic in character and less reactive than benzene
3. Ferrocene is neither aromatic nor reactive as compare to benzene
4. None of these

(viii) One of the following about ferrocene is correct

1. It is diamagnetic orange red crystas
2. It is yellow liquid
3. It is not aromatic
4. It is less reactive than benzene

(ix) The structure Li4(CH3)4 is

1. Pyramidal
2. Tetrahedral
3. Square planar
4. None of these

(x) Trialkyl aluminium behaves as a

1. Lewis base
2. Lewis acid
3. Neutral
4. None of thses

**Section B**

1. What is Back Bonding? Explains the Structure, Bonding, Hybradisation and Magnetic properties of Zeiss’s salt complex.
2. Explains the 18 electrons concepts for Ferrocene? Explain the Preparation of Ferrocene? Comparison of aromaticity and reactivity with that of benzene?
3. Give the name, preparation and structure of Zeise’s salt. Whether it shows synergic effect.
4. Describe the preparation, reaction and structure of ferrocene.
5. Discuss the role of trimethyl aluminium in polymerisation of ethane.
6. Give an account of multicentre bonding in metal alkyls.
7. Short notes of the following questions
8. What is the geometry of pentacarbonyl iron(0)?
9. What is the electron count for ferrocene?
10. How many bridging carbonyl ligands are present in solid Co2(CO)8?
11. What is the name of CH3-Be-CH3
12. What is the role of Ziegler-Natta catalyst.
13. Why lithium alkyl and aryls are more stable than the corresponding alkyl or aryls of other alkali metals?

* (N.B. Students are required to submit the assignments on declared dates (within one week when the assignment is given). **Late submission will be penalized with low marks**. Assignments which are copied or are of poor quality may be asked for re-submission of assignments.)