

C.C 13, CHEMISTRY HONS.

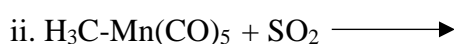
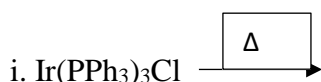
1. Answer all the questions

[1×8=8]

- i. What is heptacity.
- ii. Give an example of biological organometallic compound.
- iii. Write the group reagent for gr-II basic radical separation.
- iv. Write the relation between stepwise and overall formation constant.
- v. What is catalytic species for hydroformylation.
- vi. Which step determines rate for wacker process.
- vii. Wilkinson's catalyst whether stereospecific or stereoselective.
- viii. What is dissociative reaction.

2. Answer any **Eight** the questions

[1.5×8=12]



Iv. What is oxidative addition reaction.

v. What is sandwich compound.

Vi. Which d-orbitals used for sigma bonding in octahedral complexes.

vii. In neutral form of NO, how many electron contribution to central metal atom it does.

viii. Whether ferrocene is diamagnetic or para magnetic.

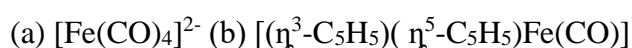
ix. What is 1,2-insertion.

x. Between $[\text{Co}(\text{NH}_3)_5\text{Cl}]^{2+}$ and $[\text{Co}(\text{NH}_3)_5\text{I}]^{2+}$ which will undergo substitution reaction faster at normal condition.

3. Answer any **Eight** the questions

[2×8=16]

- i. Why bond order of ethylene is between 1-2 in Zeiss's salt.
- ii. What is synergic bonding. Give an example.
- iii. Write the difference between thermodynamic and kinetic stability of a compound.
- iv. Write the mechanism for conversion of alkene to alkane using Wilkinson's catalyst.
- v. Prove whether the following compounds satisfies $18e^-$ rule or not:



Vi. Predict the appropriate 3d-series metal for following organometallic compound:

(a) $[M(CO)_5(PPh_3)]^-$ (b) $[(\eta^5-C_5H_5)M(CO)_3]_2$

VII. Predict the M-M bond present in following organometallic compound:

(a) $Os_4(CO)_{14}$ (b) $Fe_3(CO)_{12}$

viii. Prepare cis and trans- $[Pt(NH_3)_2Cl_2]$ starting from required starting material.

ix. Which organometallic reagent used for conversion of alkene to aldehyde.

x. What is the role of $CuCl_2$ in wacker process.

4. Answer any **Four** questions

[4×6=24]

I. Discuss preparation bonding of $Fe(CO)_5$ and $Mn_2(CO)_{10}$.

ii. Discuss preparation bonding of $Ni(CO)_4$ and $Fe_2(CO)_9$.

iii. Give a brief outline of formation polythene from ethene using Zeigler-Natta catalyst.

iv. Discuss bonding in tetramer of methyl lithium.

(b) Write the product of electrophilic substitution reaction of ferrocene

Alkylation, mannich condensation.

v. Discuss mechanism of formation aldehyde from alkene using hydroformylation.

Vi. Discuss the mechanism of Wacker process.

vii. Discuss trans effect theories of polarization and π -bonding theory.

viii. Derive kinetics of associative and interchange dissociative mechanism.