

- Q1. What are organometallic compounds? ^{Comment on} Describe the applications of organometallic compounds with examples.
- Q2. Write a note on the classification of organometallic complexes based on the nature of M-C bond.
- Q3. What is Hapticity of a ligand? Comment on the types of ligand base on hapticity.
- Q4. Complete the table given below: (1st one is done as an example).

Ligand Name	Bonding Type	Formal charge	Electron donation
Molecular Hydrogen H_2	$M \leftarrow \begin{array}{c} H \\ \\ H \end{array}$	0	2
Hydride: H^-			
NH_3 , PR_3 , AsR_3			
$N \equiv O^+$ (linear)			
$N \equiv O^-$ (bent)			
$C \equiv O$			
$C \equiv O$ $\mu \eta^2$ mode			
$C \equiv O$ (μ bridging)			
$R_2C=CR_2$ (η^2)			
$RC \equiv CR$ (η^2)			
$R_2C=CH-CH=CR_2$ (η^4)			
C_6H_6 (η^6)			

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Ligand Name	Bonding Type	Formal charge	Electron donated
$\text{CH}=\text{CH}_2 (\eta^2)$			
Allyl: C_3H_5^- η^3 terminal			
Allyl: C_3H_5^- η^1 terminal			
$\text{C}_5\text{H}_5^- (\eta^5)$			
$\text{C}_5\text{H}_5^- (\eta^3)$			
Carbene: $=\text{C}^\text{YR}$ (Y = Capable of π donation)			
Alkylidene: $=\text{CR}_2^{2-}$ where no substituent capable of π -bonding			

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Write a short note on essential and beneficial elements.