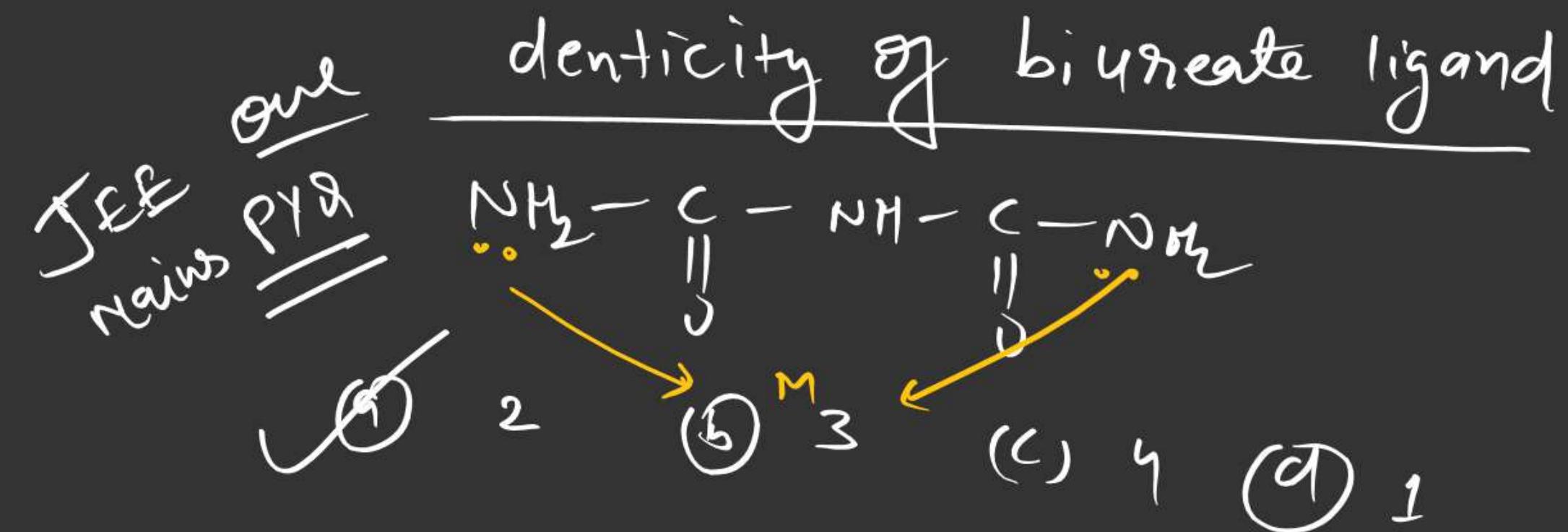
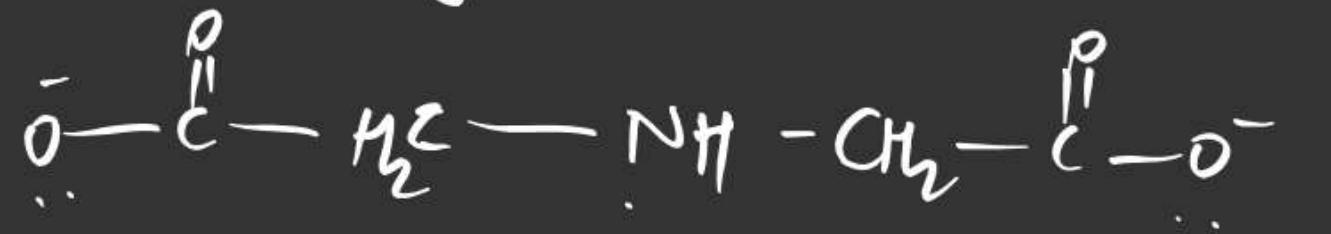


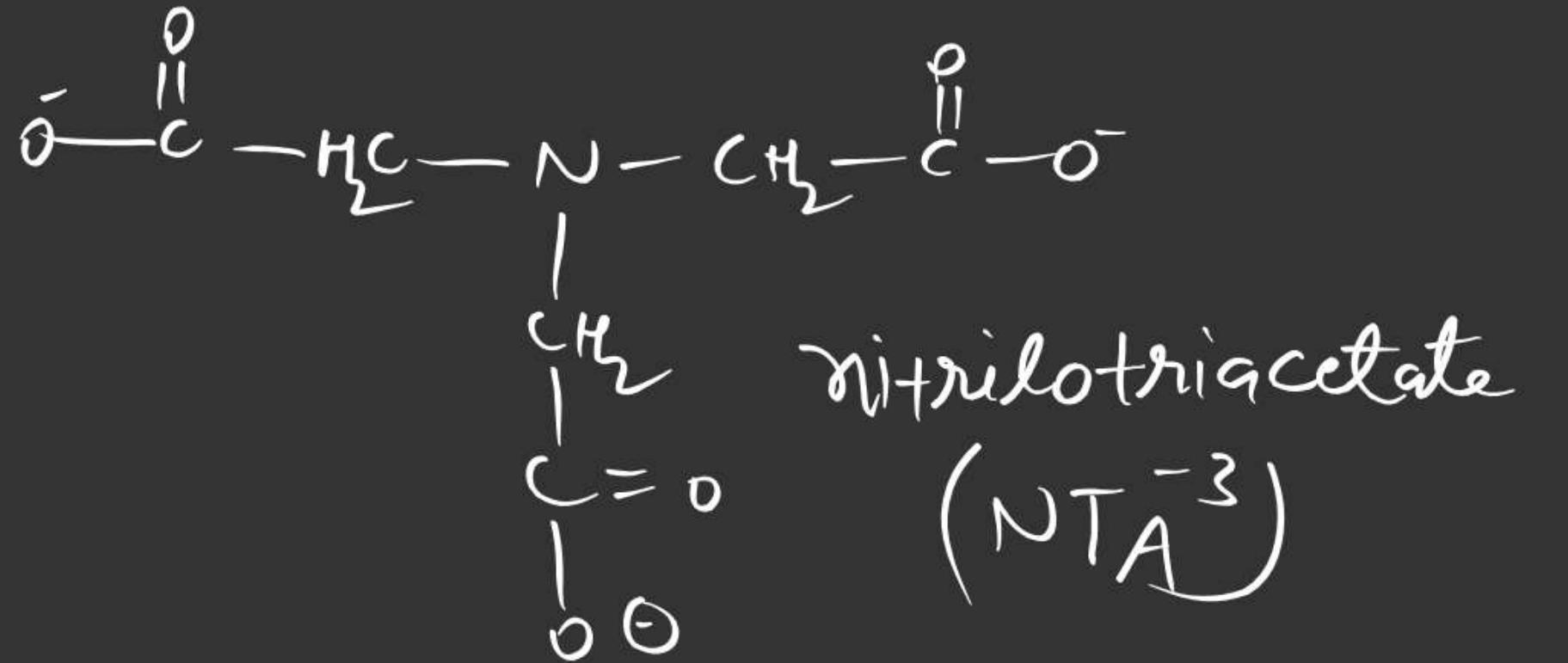
Polydentate ligand



Polydentate



Imino diacetate (Imda)

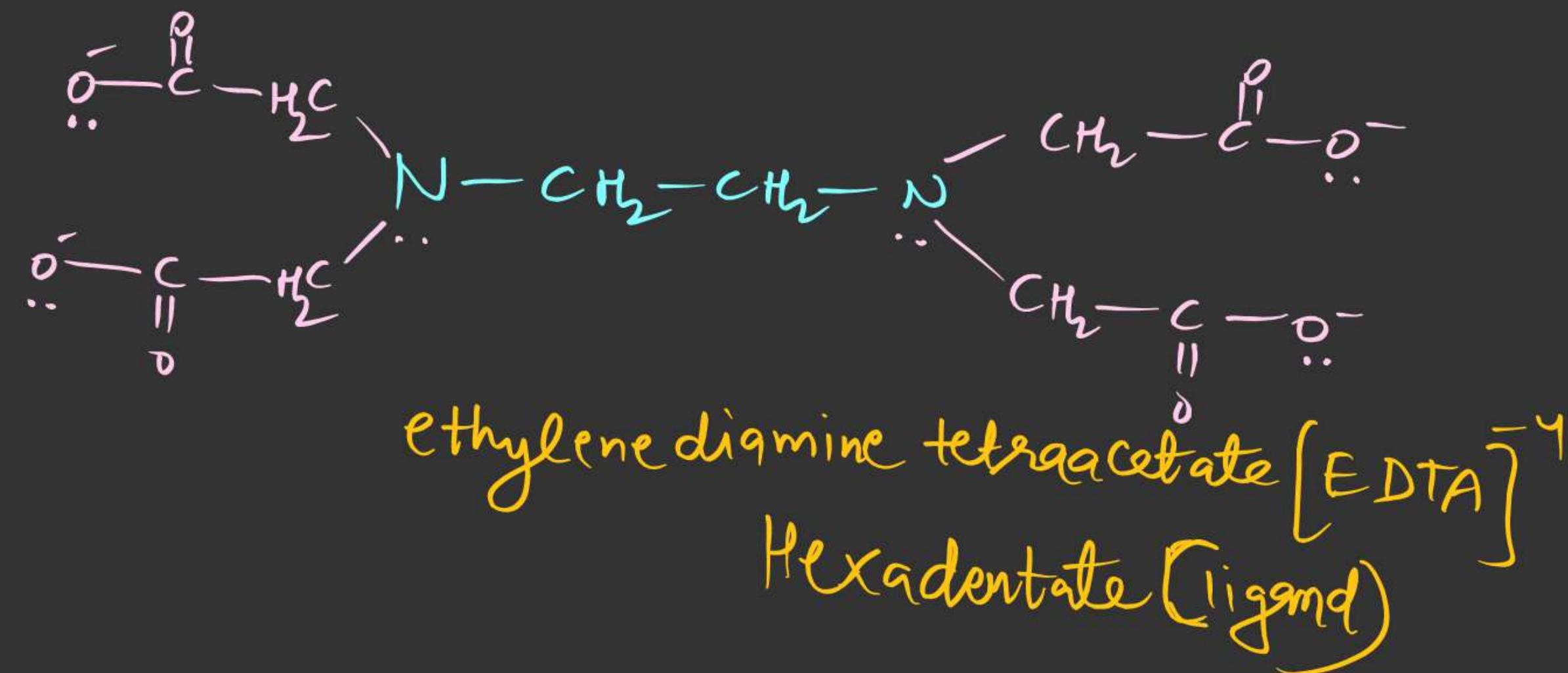




(dien)
(diethylene triamine) (dien)



(triene)
(triethylene tetraamine)



one find the

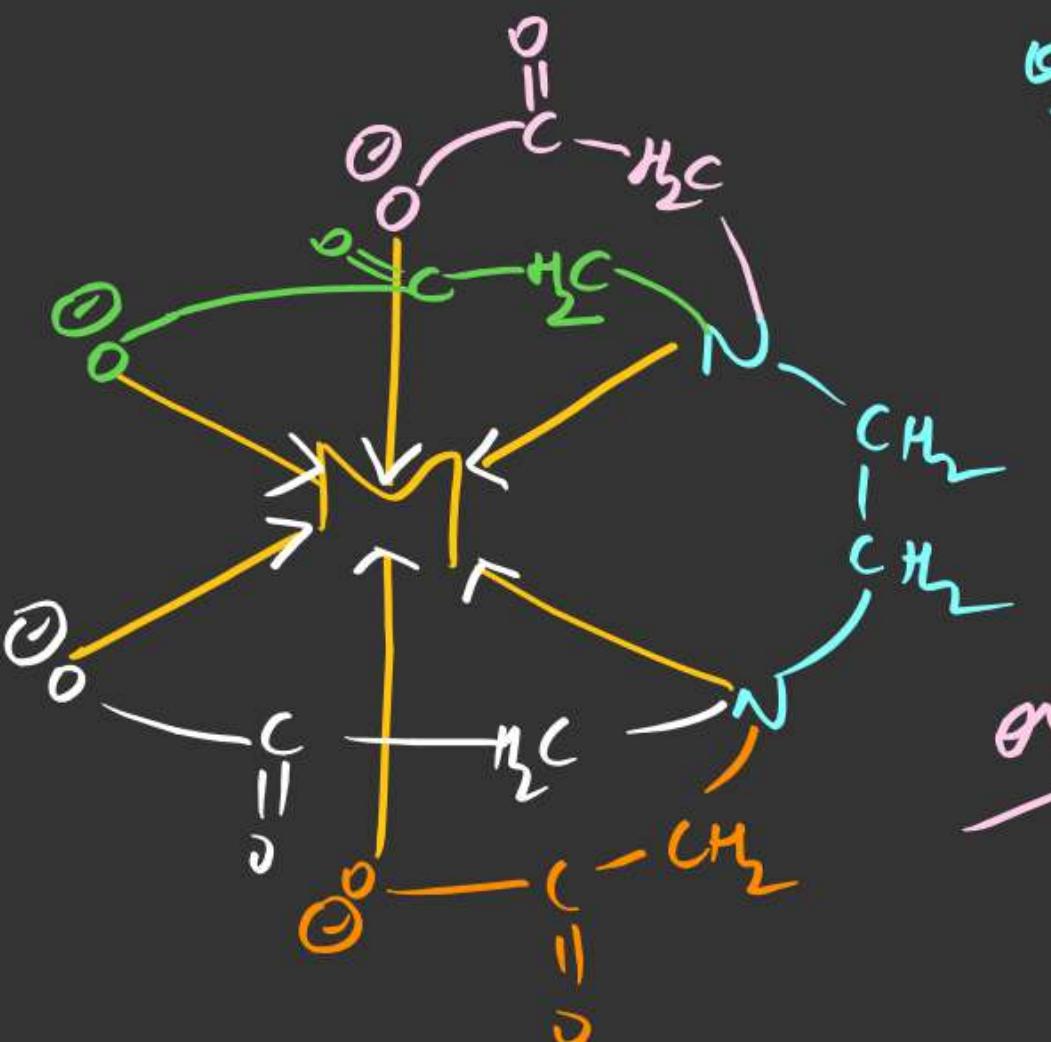
N - M - O linkage

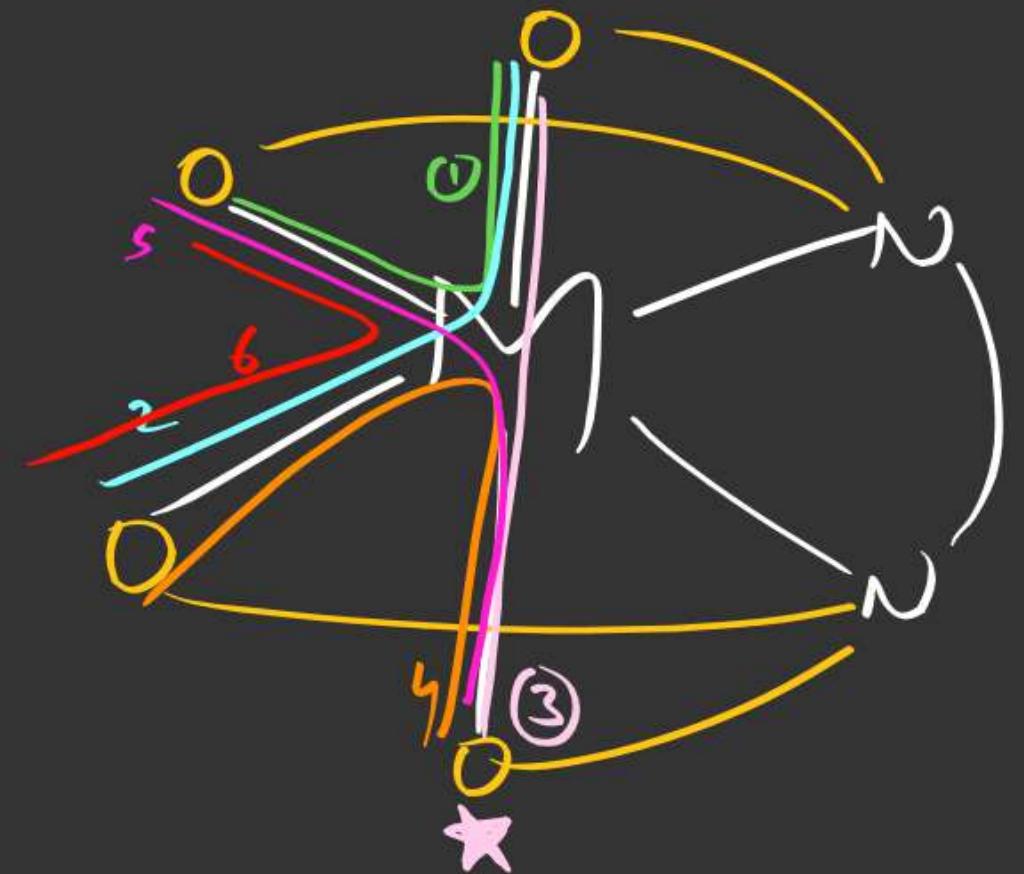
$$\text{Ans} = \underline{\rho} = 8$$

one find the

O - M - O linkage

$$\text{Ans} = \underline{\delta}$$

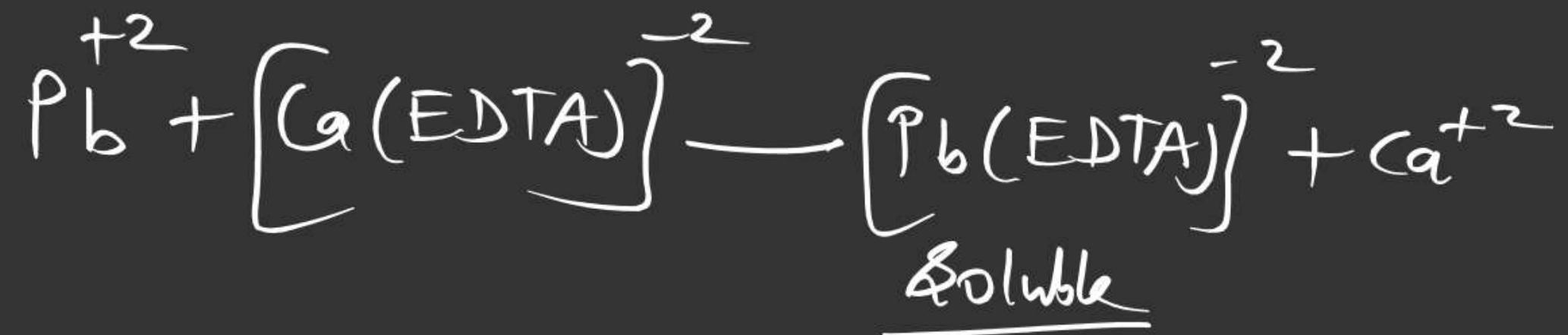




D - M - O

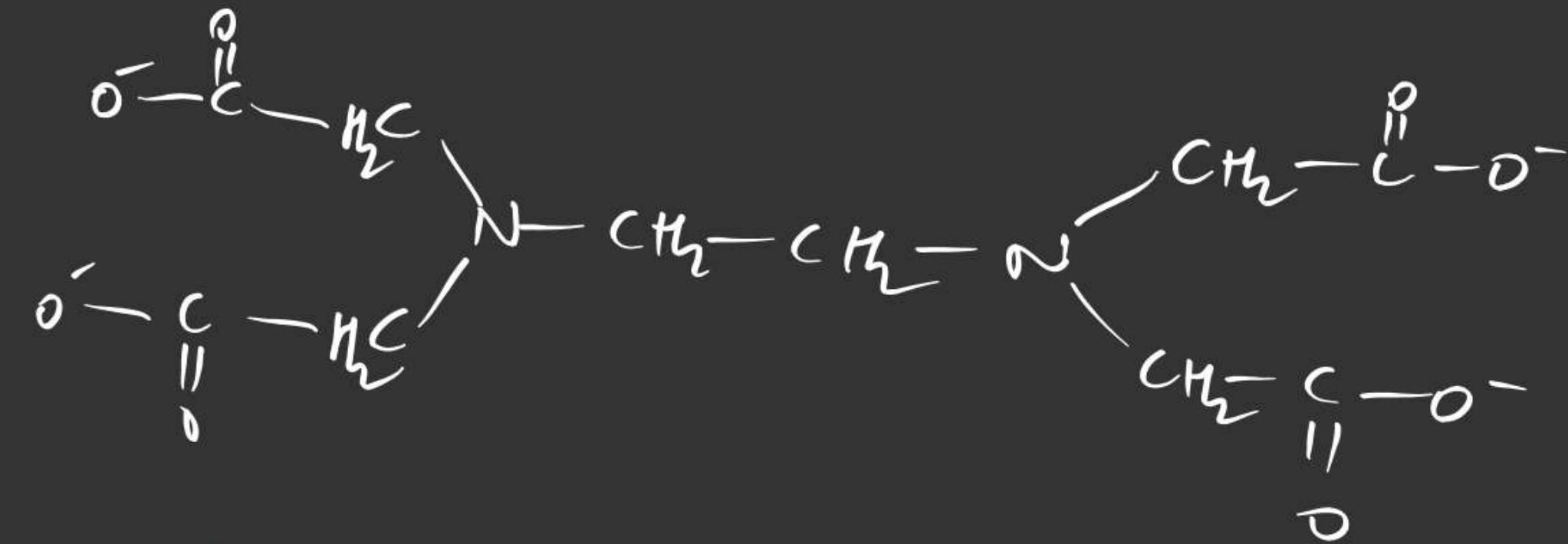
Ans = 6

Note \Rightarrow uses of EDTA



② EDTA can used for removal
of Hardness of water

③ EDTA can be used for estimation of
 Ca^{+2} and Mg^{+2} ions. Only at high pH
because at low pH EDTA will be
protonated.



H₄EDTA [ethylene diamine tetracetic acid]

$$\text{H}_3\text{EDTA}^-$$

H₂EDTA²⁻

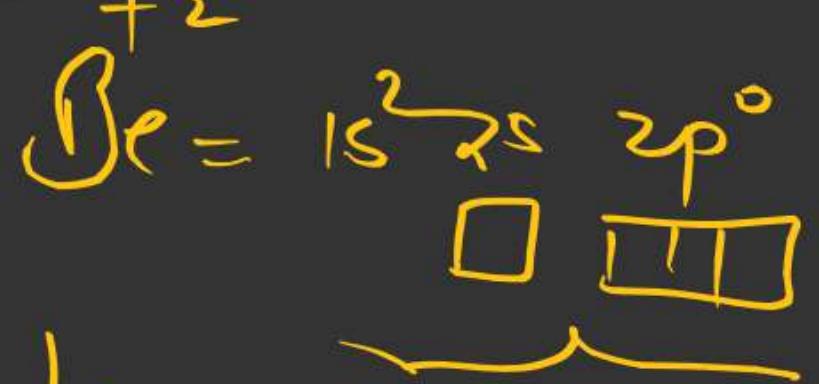
MEDIA-3

EDTA

ans

Which of the following cation does not form complex with EDTA

- Be⁺² Ca⁺² Mg⁺² all can form complex

Ans = Be⁺²

because, it has only 4 vac. orbital



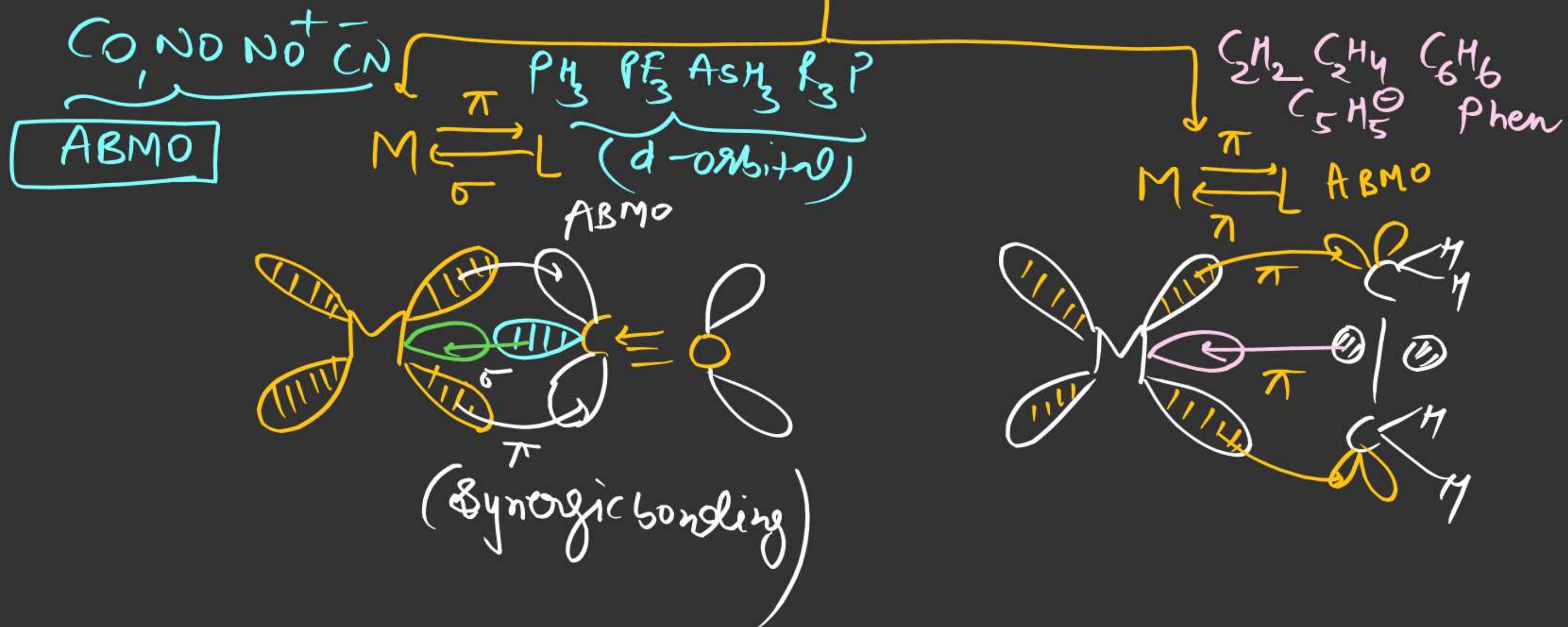
Hydroxyquinoline

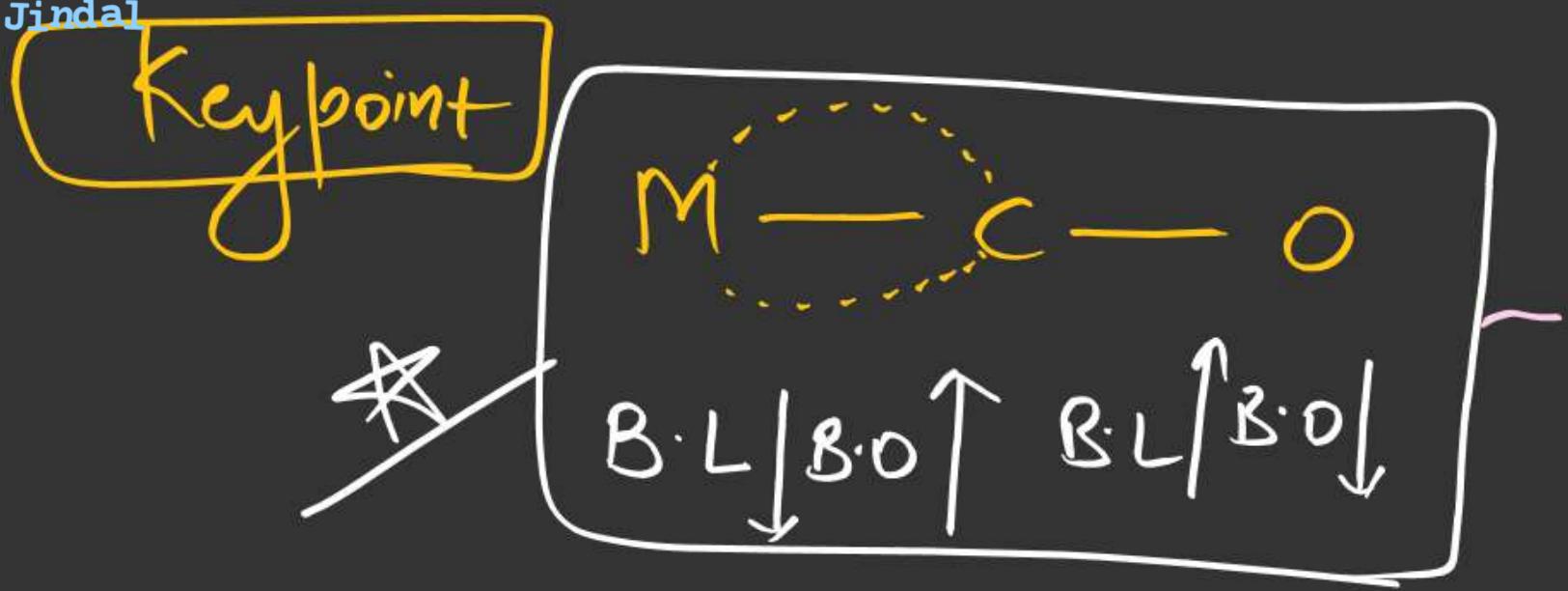
③ On the basis of donating and accepting prop.



- ① Classical — ligand which can only donate l.p.
- non Classical — ligand which can donate its l.p. in vacant orbital of Metal Cation or atom but simultaneously e^- accept in its Vacant Anti Bonding molecular orbital or d-orbital through Back bonding this back bond formation process is known as Synergic bonding.

non Classical ligand (π -acid ligand)





Synergic bonding → depends on donating prop. of . metal cation and accepting prop. of ligand

Order of C-O B-L

$$\left[V(c_0)_6 \right]^\dagger < \left[V(c_0)_6 \right] < \left[V(c_0)_6 \right]^\theta$$

Order of C-O B-D

Order of M-C B-O

Order of M-C B-L

>

<

>

<

>

Ques Which of the following complex ion have higher C-O β - L

- ① $\text{Ni}(\text{CO})_4$ ② $[\text{V}(\text{CO})_6]^-$ ③ $\text{Fe}(\text{CO})_5$ ~~④ $[\text{Ti}(\text{CO})_6]^2$~~



Stretching
Vib. fr.

one Which of the following complex ion
have higher $\nu_{\text{M-C}}$ bond

- Ⓐ $[\text{Mn}(\text{CO})_6]^+$
- Ⓑ $[\text{Ti}(\text{CO})_6]^{02}$
- Ⓒ $\text{Fe}(\text{CO})_5(\text{H})\text{Ni}(\text{CO})_4$

Note \Rightarrow B.L of C-O in isolated condition is 1.128 \AA but in complex compound it will be 1.150 \AA due to synergic bonding

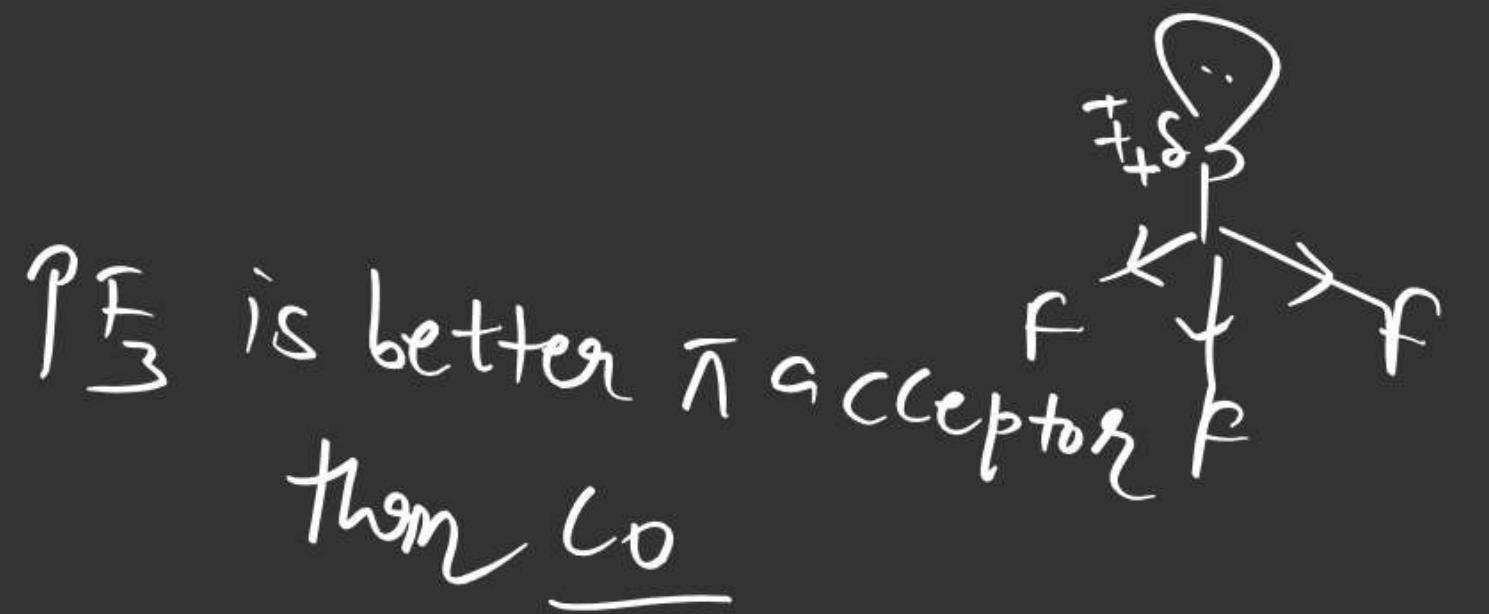
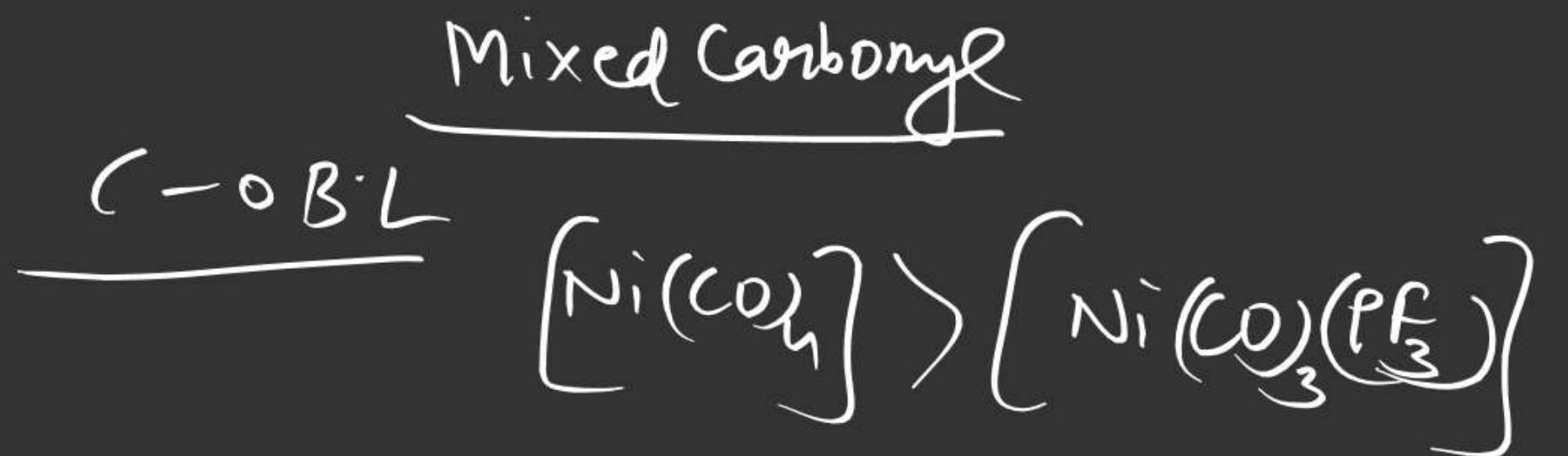


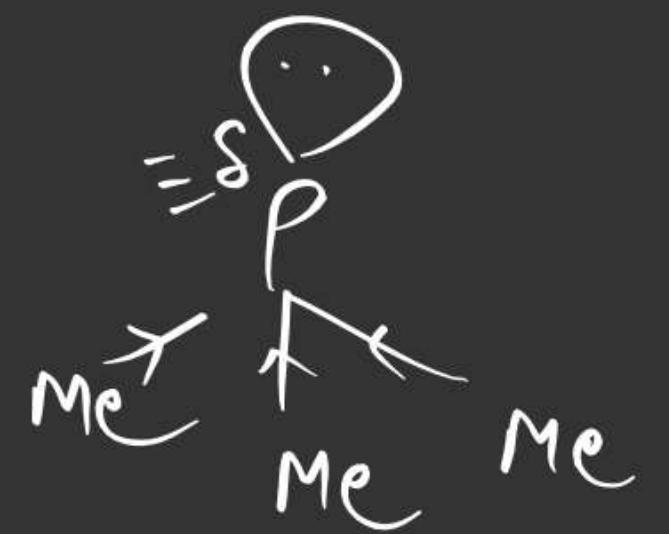
1.128 \AA



1.15 \AA

- ~~2001~~
- and C - O B.L. in $\left[\text{Fe}(\text{CO})_5 \right]$
- (a) 1.128 \AA
- ~~(b)~~ 1.150 \AA
- (c) 1.115 \AA
- (d) 1.172 \AA





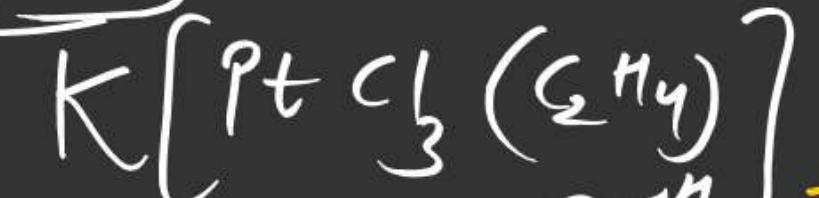
C-OBL



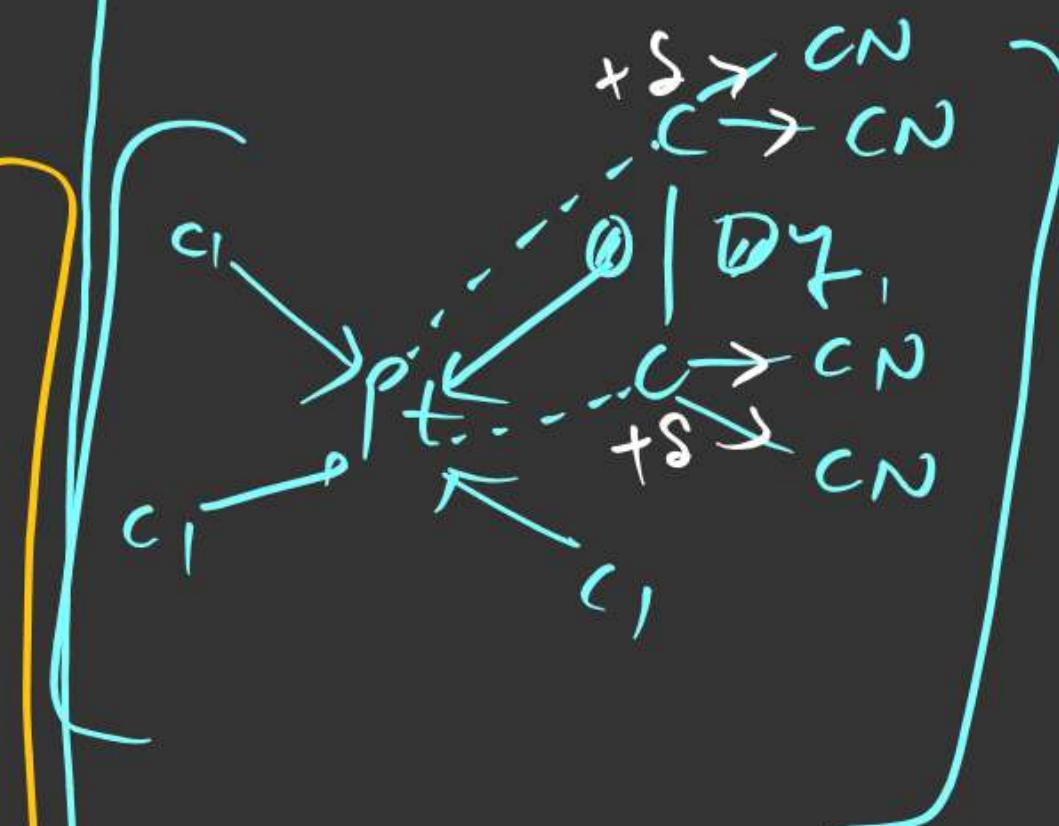
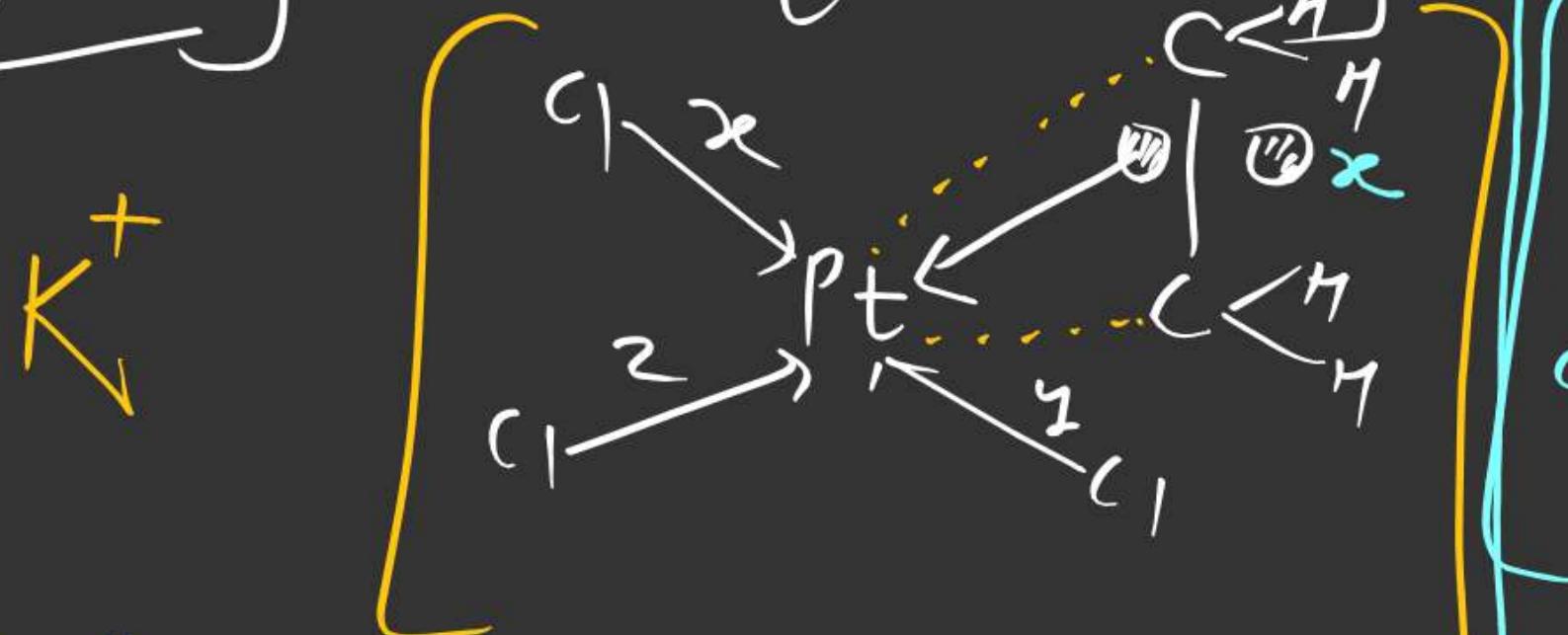
Draw the Zeise salt

* due to trans effect

$$x = y < z$$



$$x < y$$

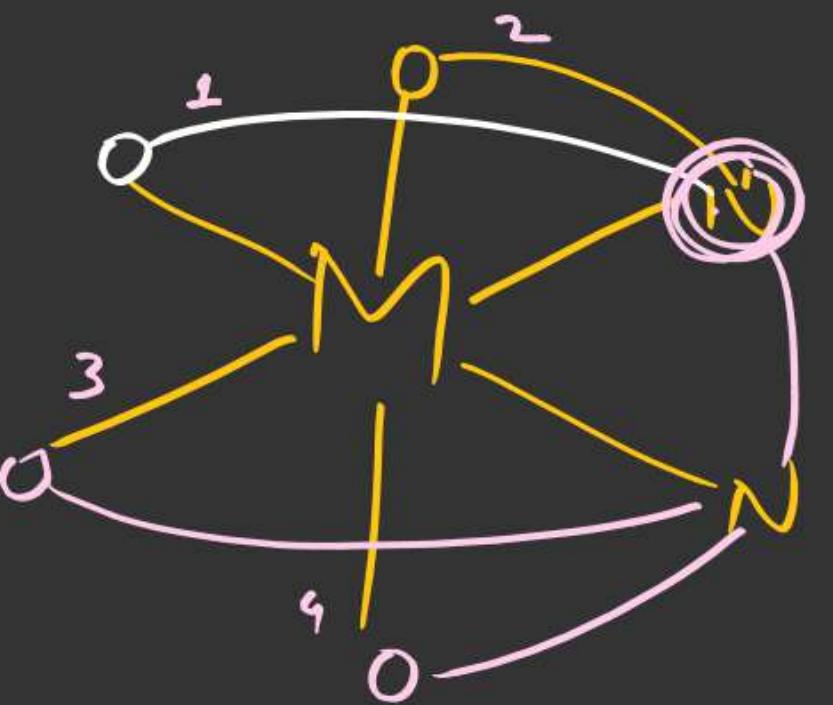


In isolated condition $C-C$ is σ but in complex compound $C-C > \sigma$ due to synergic bonding

Note \rightarrow dsp^2

Sq. planar, but not perfect Sq. planar

because Σ_{H_2} \perp to the plane



$$\begin{array}{c} N - M - O \text{ linkage} = 8 \\ \hline \end{array}$$