Q In $[Fe(CO)_5]$ Metal carbon bond has -

(A) σ bond only

(B) π bond only

(C) σ & π bond

(D) only ionic bond

Q. Arrange them in Increasing C-O bond length.

CO	CO^+	$[Cr(CO)_6]$
1.128	1.115	
(1)	4	(2)

$2 > (1) > CO^+$

Q. Matching:-

(I) Ligand	(II) orbital of ligand involve in synergic bond to accept electrons from metal
(A) NO^+ $:N\equiv O^+:$	
(B) $\bar{C}N$ $:\bar{C}\equiv N:$	(P) σ
(C) PF_3	(Q) π^*
(D) $R-C\equiv N:$	(R) σ

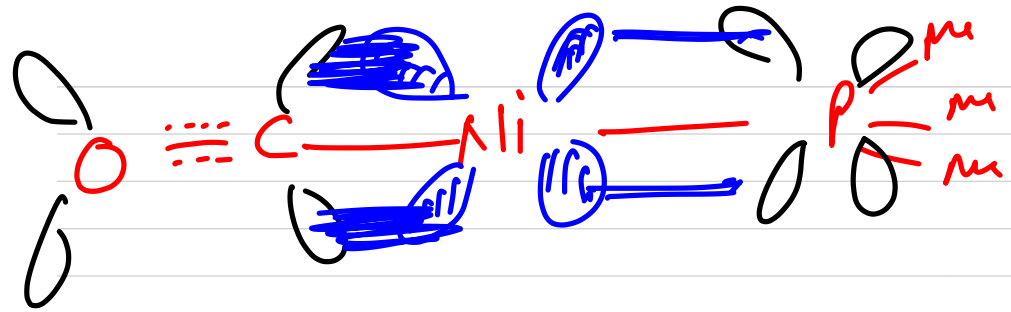
Q. Which is having highest π-acceptor ability:-

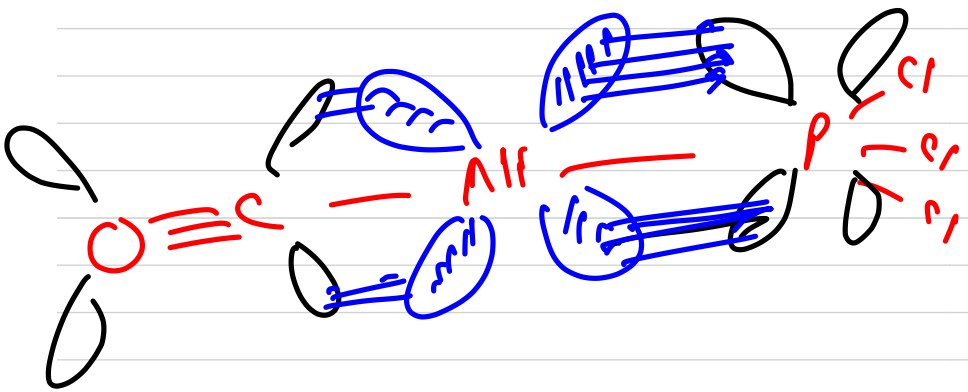
(A) PMe_3 (B) NMe_3

(C) PCl_3 (D) NF_3

Q. Which Complex have Higher C-O bond Energy-

(A) $[Ni(CO)_3PMe_3]$ (B) $[Ni(CO)_3PCl_3]$





Q. write IUPAC Namin of

(1) $[Fe(CO)_5]$ — bis (pentacarbonyl Manganese(0))

pentacarbonyl iron(0)

(2) $[Mn_2(CO)_{10}]$ / $[Mn(CO)_5]_2$

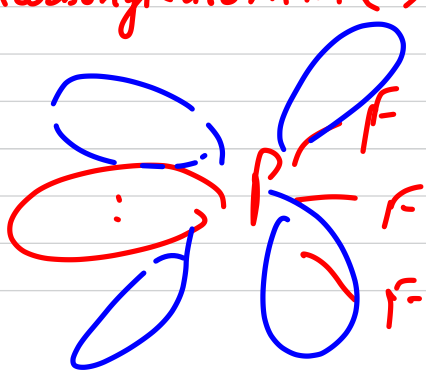
decacarbonyl dimanganese(0)

(3) $[V(CO)_6]^-$

hexacarbonyl vanadate(-I) ion

(4) $[Cr(CO)_6]^+$

hexacarbonylchromium(I) ion



$[Fe(\eta-C_5H_5)_2]$ ferrocine

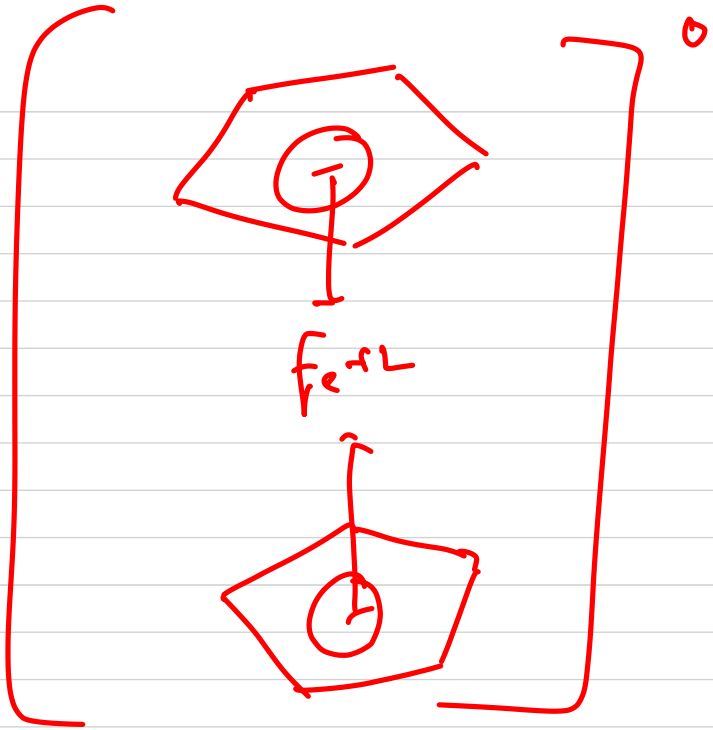
bis(η^5-cyclopentadienyl)iron(II)

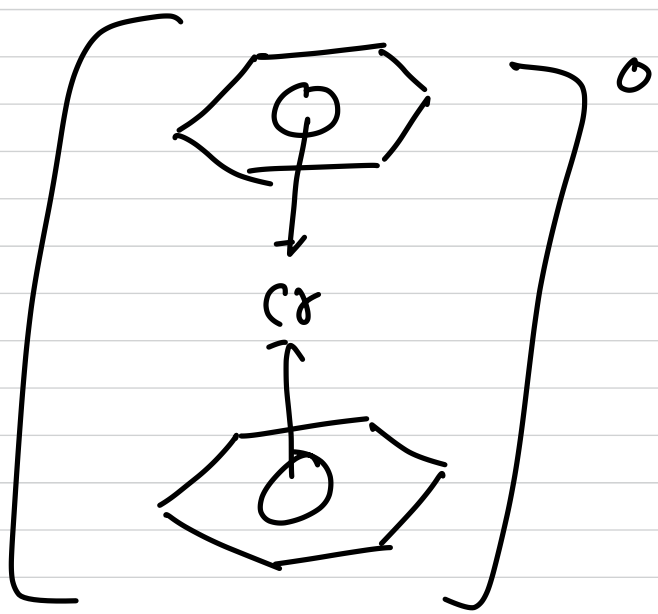
$[Cr^{0}(\eta-C_6H_6)_2]$

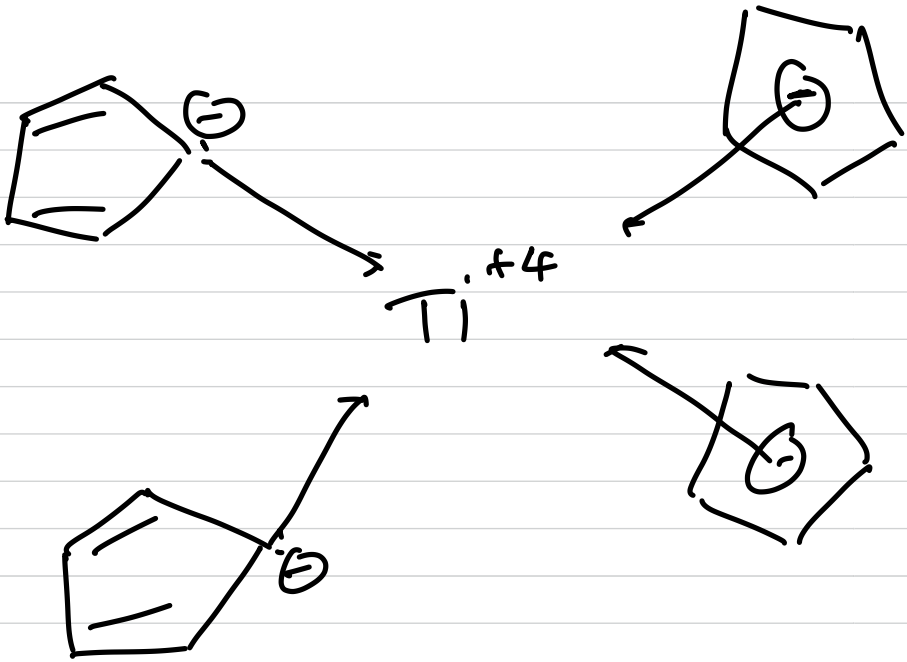
bis(η^6-benzene) chromium(0)

$[Ti^{+4}(\sigma-C_5H_5)_2(\eta-C_5H_5)_2]$

bis(η^1-cyclopentadienyl) bis(η^5-cyclopentadienyl)
titanium(IV)


Fe+2


Cr


Ti
+4

Historical Th. of the formation of co-ordination comp.

(1) Warner Th.:-

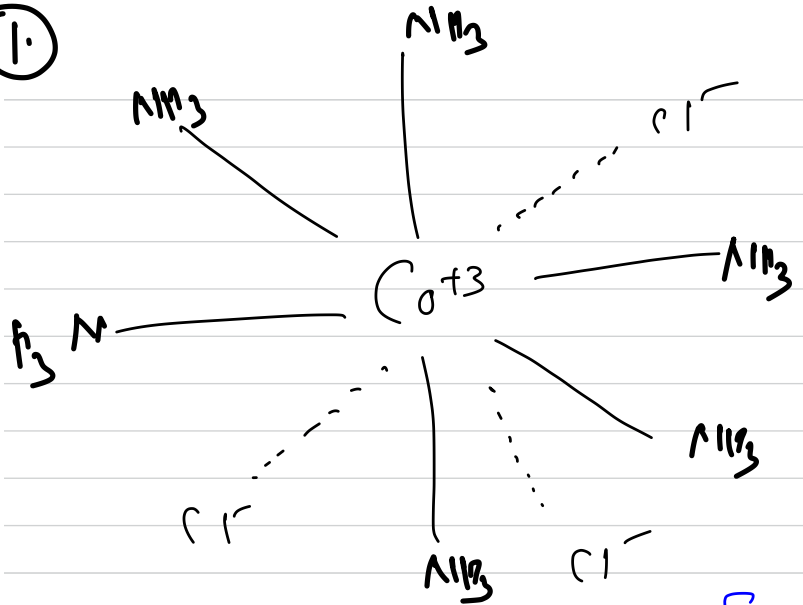
		$AgNO_3$ Aq.	Conductivity	(i)
(1)	$CoCl_3 \cdot 6NH_3$	3 mole AgCl	highly	4
(2)	$CoCl_3 \cdot 5NH_3$	2 mole AgCl	Moderate	3
(3)	$CoCl_3 \cdot 4NH_3$	1 mole AgCl	low	2
(4)	$CoCl_3 \cdot 3NH_3$	No AgCl	X	1

(1) two type of valency → P (O.N.)
→ S (C.N.)

(2) P.V. of Co = +3
S.V of Co^{+3} = 6

(3) PV = ionizable
SV = Non ionizable
(SV = Directional)

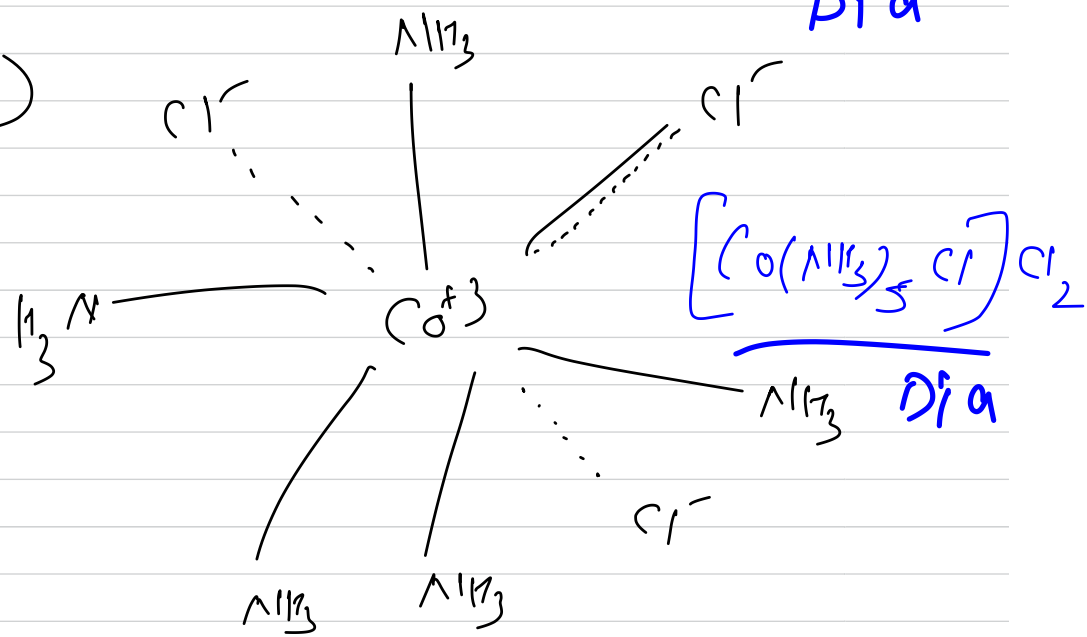
(1)



$[Co(NH_3)_6]Cl_3$

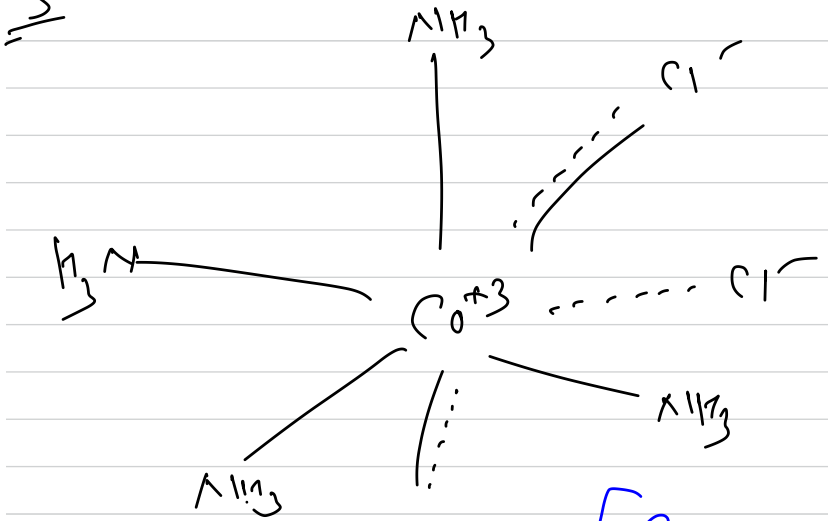
Dia

(2)



$[Co(NH_3)_5Cl]Cl_2$

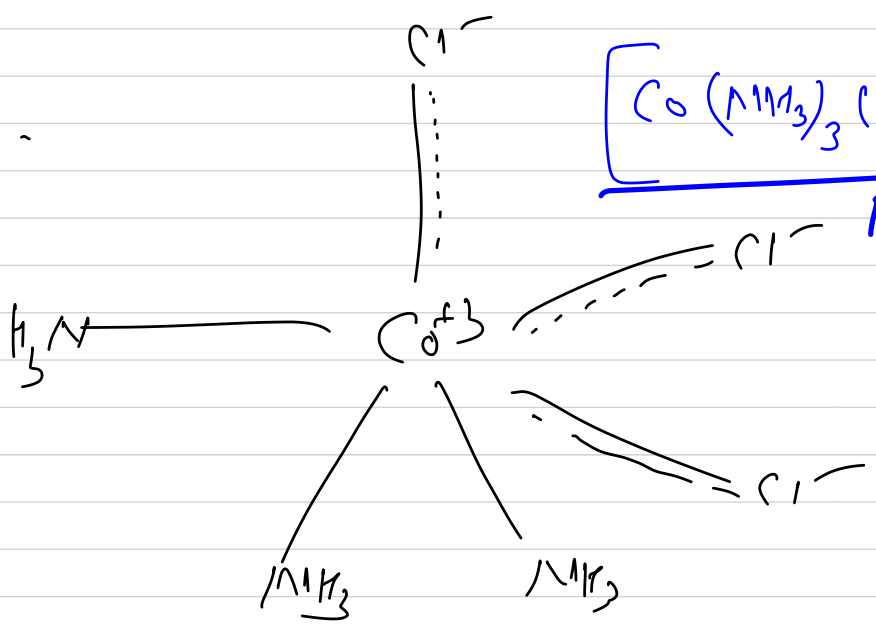
3.



$[Co(NH_3)_4Cl_2]Cl$

Diamet

4.



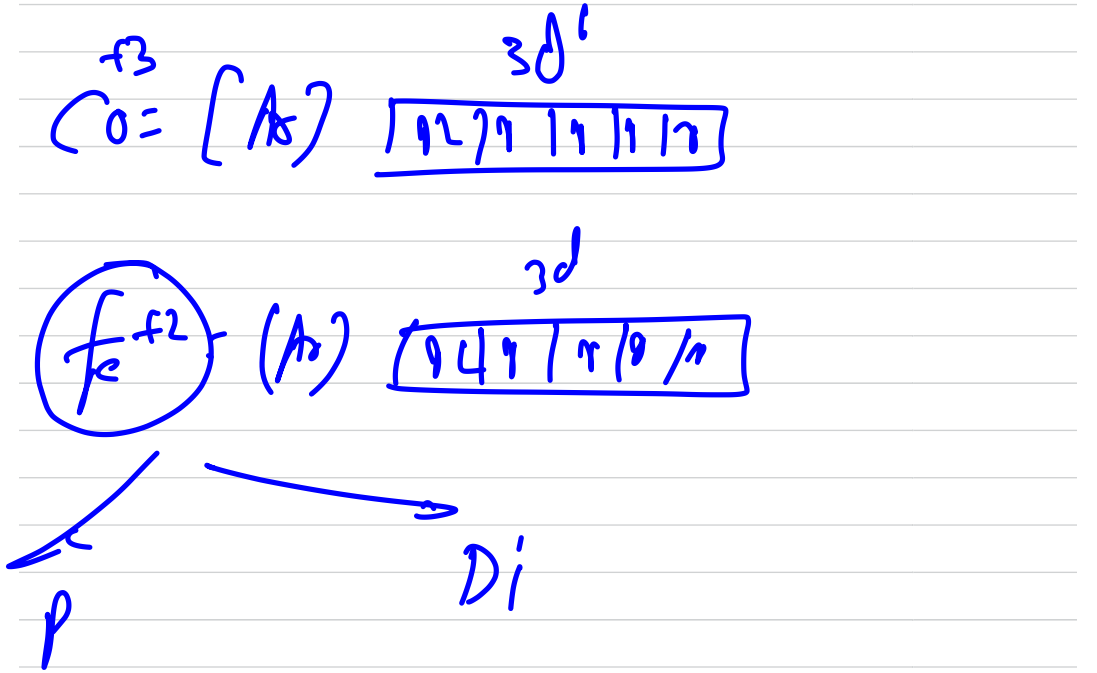
$[Co(NH_3)_3Cl_3]^0$

Dia

1. SV is fix
2. Shape Cartly

Limitation of warner

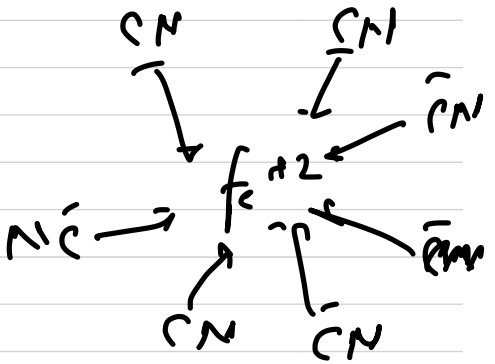
3. unable to Explain Color
4. " " " relative stability
5. unable to Explain Multiple number of oxidation state



(2) Sidwick E.A.N. Theory :-

$$EAN = (Z - O.N.) + 2(CN)$$

$K_4[Fe^{II}(CN)_6]$



$$\begin{array}{r} 26 \\ -2 \\ +12 \\ \hline 36 \end{array} \quad (Kr)$$

$Fe = [Ar]\,3d^6\,4s^2$

$Fe^{+2} = [Ar]\,3d^6$

$$\begin{array}{r} 6 \\ +12 \\ \hline 18 \end{array}$$

valence

FAN valence

$[Cu(NH_3)_4]SO_4$ 35 —

$[Ni(en)_3]Cl_2$ 38 —

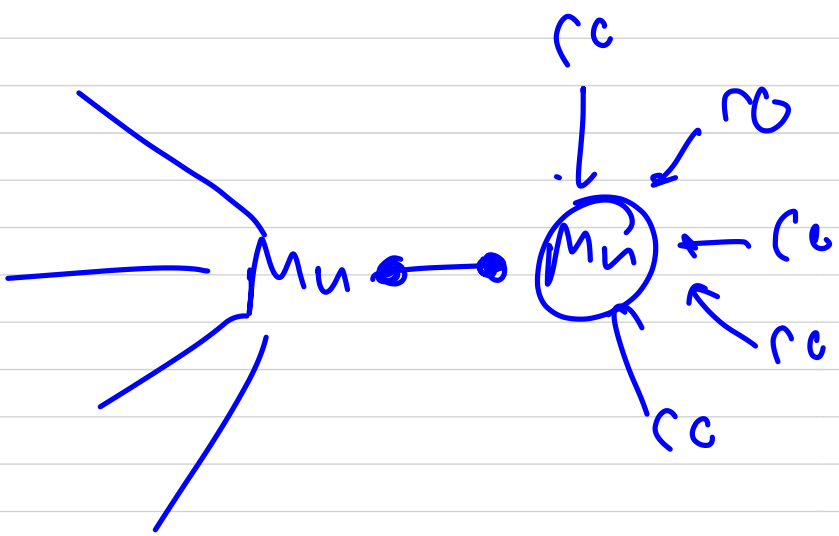
$K_2[PtCl_4]$ 84 —

$(CO)_5Mn-Mn(CO)_5$ 36 —

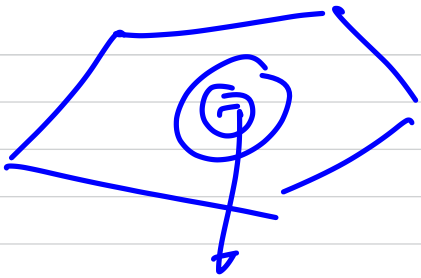
(36) (36)

$[V(CO)_6]^-$ (36) —

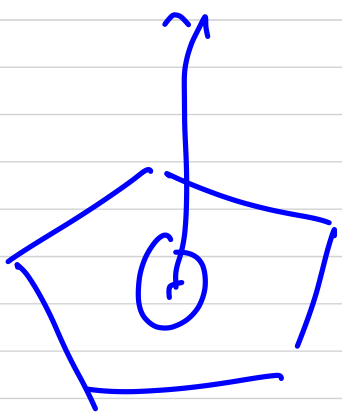
$[Fe(\pi\text{-}C_5H_5)_2]$ 36



25
10
35
+1
36



Fe^{+2}



$$
\begin{array}{r}
26 \\
-\ 2 \\
\hline
24 \\
+\ 6 \\
+\ 6 \\
\hline
36
\end{array}
$$

H.W.

valency -

Q written Q.

Q IFE(M) chemical bonding

Q which is most stable carbonyl

(A) $[V(CO)_6]$ (B) $[Mn(CO)_6]$

(C) $[Cr(CO)_6]$ (D) $[Fe(CO)_4]$

Q which is not as a good reducing agent.

(A) $[Cr(CO)_6]$

(B) $[V(CO)_6]$

(C) $[Mn(CO)_6]$

(D) $[Fe(CO)_5]$

Q which of the following have follow 18e- Rule.

(A) $(OC)_4Co-Co(CO)_4$ (B) $[Fe(CO)_5]$

(C) $[Cr(\pi-C_6H_6)_2]$ (D) $[V(CO)_6]^-$

Q calculate EAN of Fe in

$[Fe(CO)_2(NO)_2]$