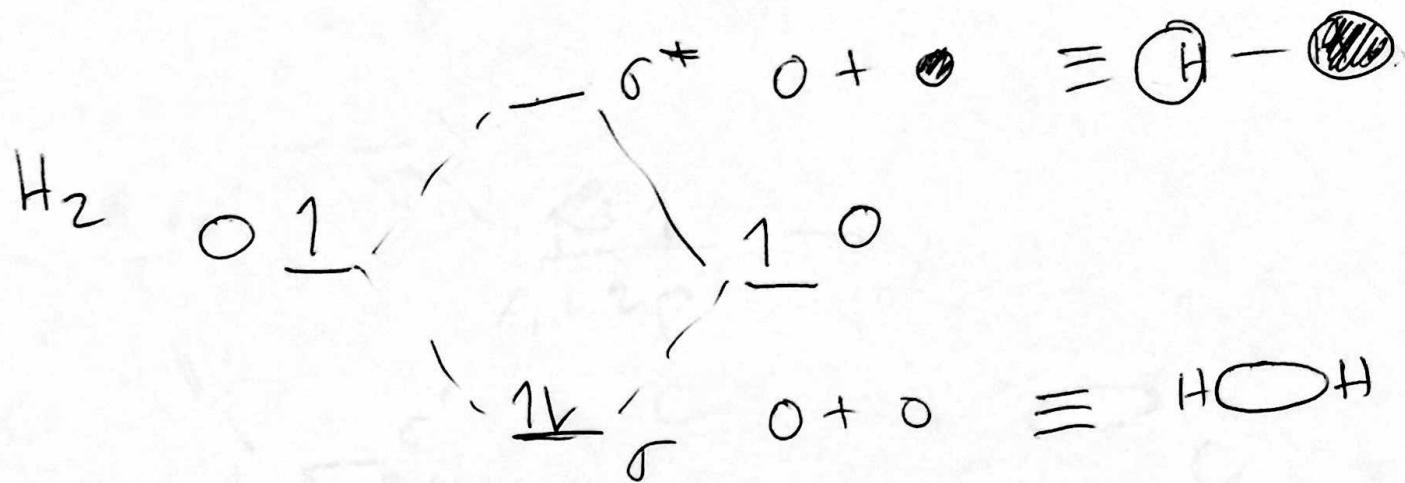
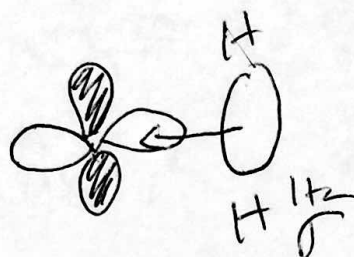
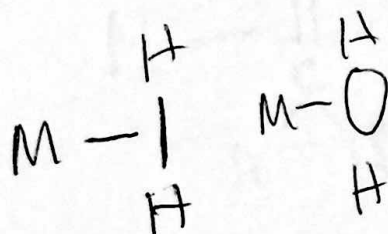


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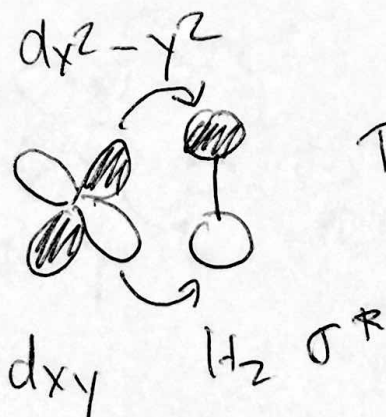
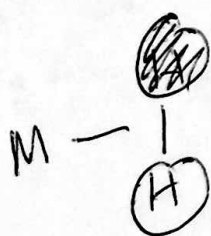


H

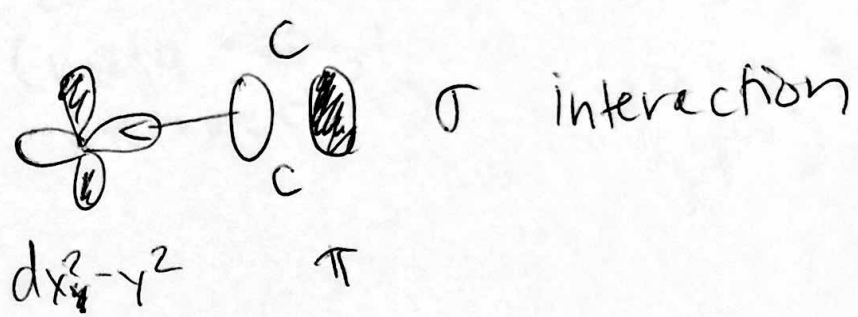
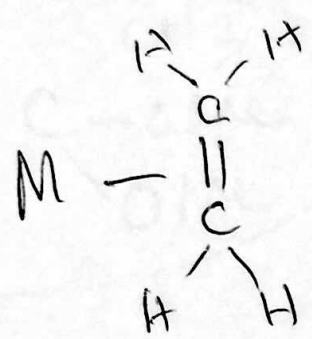
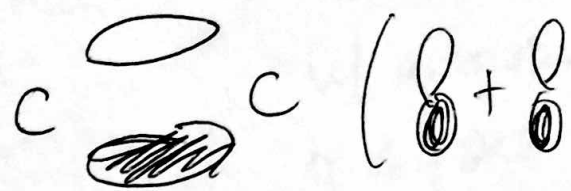
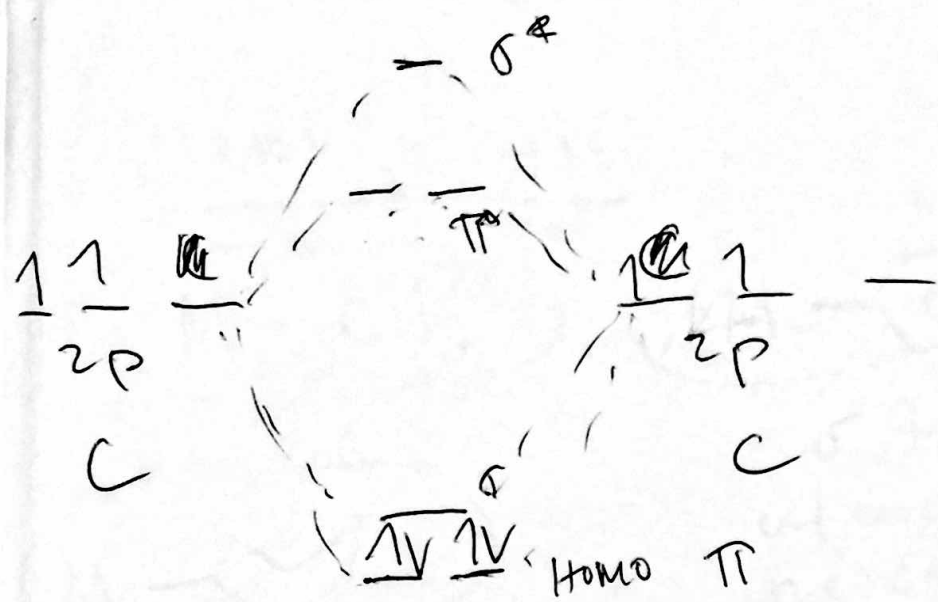
H



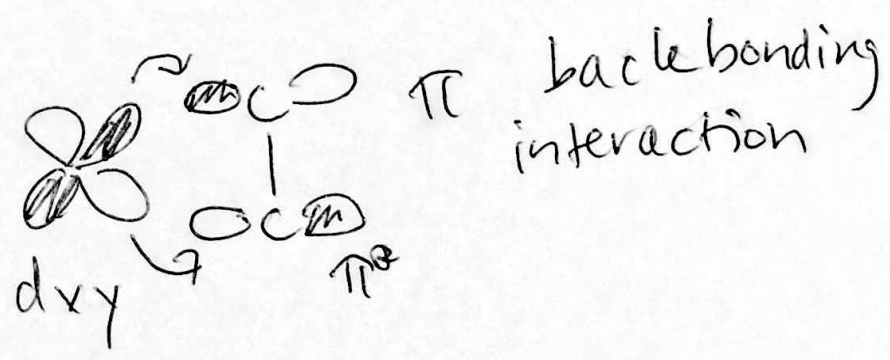
σ interaction



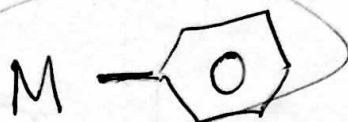
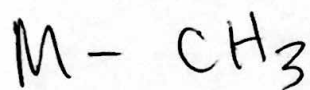
π back bonding interaction



σ can be w/ d_{z^2} as well



Metal alkyls

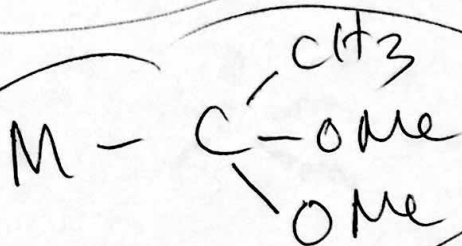
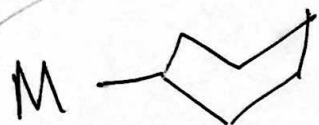


$\neq$



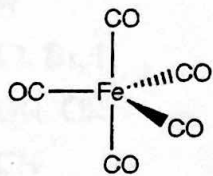
σ interaction
w/ one of
the carbons
on benzene
(metal-alkyl
interaction)

M interaction
w/ aromatic
 π system
of benzene
(similar to
 CP^+)

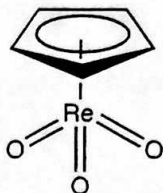


Which of the following obey the 18 electron rule?

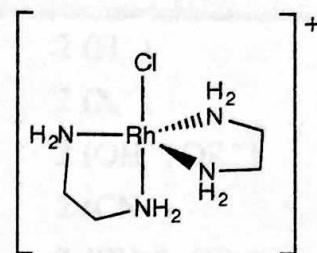
A



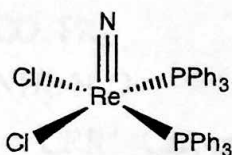
B



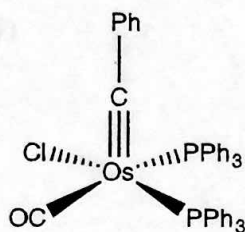
C



D



E

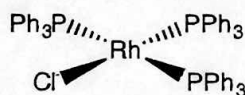


Which of the following square planar complexes have 16-electron valence configurations?

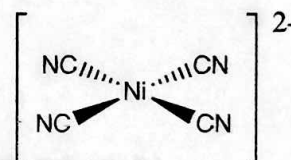
F



G



H

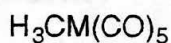


Assuming the following complexes obey the 18-electron rule, identify the first row transition metal:

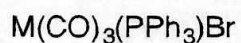
I



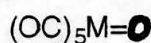
J



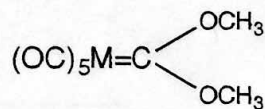
K



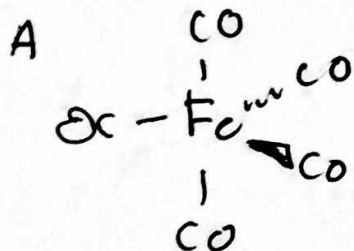
L



M

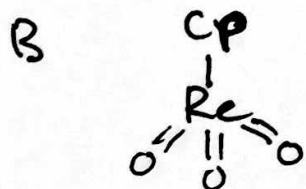


typo
↓



Overall charge: 0
Ligand charge: 0

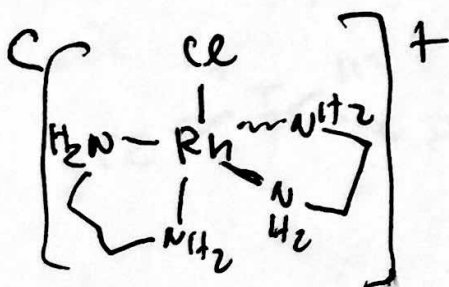
Fe(CO)	8
5 CO	2 x 5
	18



Overall charge: 0
Ligand charge: Cp^- , 3O^{2-} (7-)

Re(VII) 0

Cp^-	6
3O^{2-}	3 x 4
	18



Overall charge: +1
Ligand charge: Cp^- -1

Rh(II) 7

Cp^-	2
2 en	2 x 4
	17



Overall charge: 0
Ligand charge: 2Cl^- , N_3^- (5-)

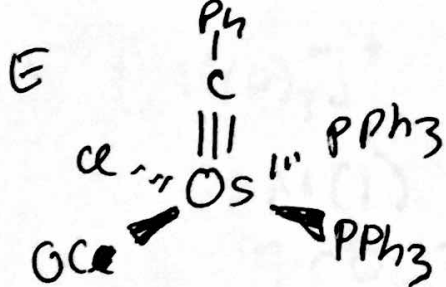
Re(V) 2

N_3^- 6

2Cl^- 2 x 2

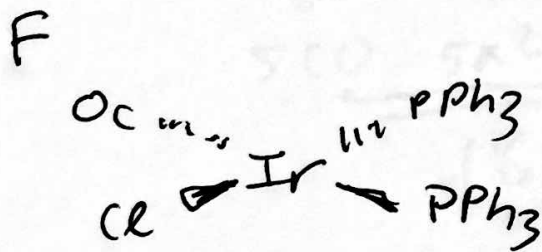
2PPh_3 2 x 2

	16



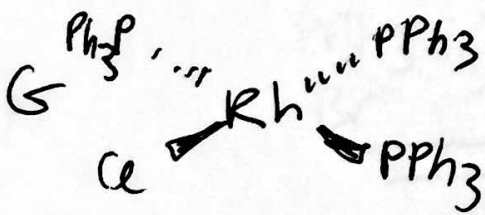
Overall charge: 0
 Ligand charge Cl^- -1

Os(I)	7
Cl^-	2
CO	2
2 PPh ₃	2x2
$\therefore \text{C}-\text{Ph}$	3
	<u>18</u>



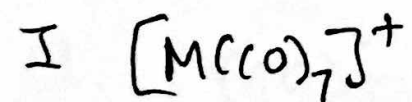
Overall charge: 0
 Ligand charge -1

Ir(I)	8
CO	2
Cl^-	2
2 PPh ₃	2x2
	<u>16</u>



Overall charge: 0
 Ligand charge -1

Rh(I)	8
Cl^-	2
3 PPh ₃	3x2
	<u>16</u>

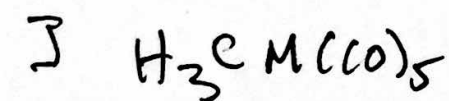


$$\begin{array}{rcl} M(I) & 4 & \leftarrow \\ 7CO & 7 \times 2 = 14 & \\ \hline & 18 & \end{array}$$

M(I) w/ 4 d electrons?

V(I)

M = V

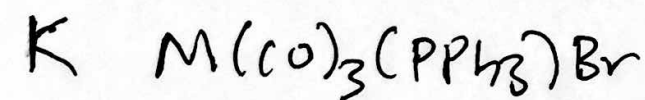


$$\begin{array}{rcl} M(I) & 6 & \leftarrow \\ H_3C^{\ominus} & 2 & \\ 5CO & 5 \times 2 & \\ \hline & 18 & \end{array}$$

M(I) w/ 6 d electrons?

Mn(I)

M = Mn

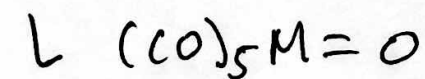


$$\begin{array}{rcl} M(I) & 8 & \leftarrow \\ 3CO & 3 \times 2 = 6 & \\ PPh_3 & 2 & \\ Br^- & 2 & \\ \hline & 18 & \end{array}$$

M(I) w/ 8 d electrons?

Co(I)

M = Co



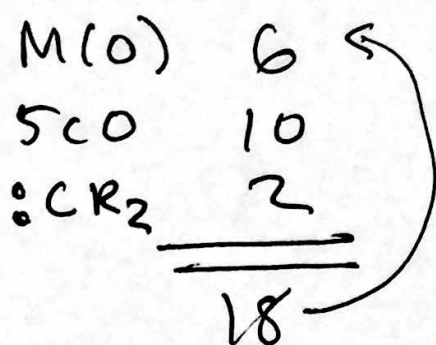
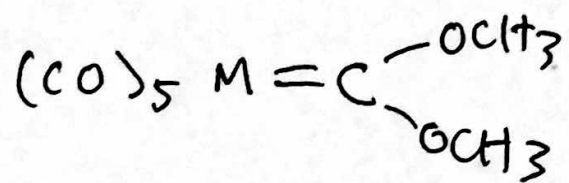
$$\begin{array}{rcl} M(II) & 4 & \leftarrow \\ O^{2-} & 4 & \\ 5CO & 10 & \\ \hline & 18 & \end{array}$$

M(II) w/ 4 d electrons?

Cr(II)

M = Cr

M



M(0) w/ 6 d_{xy} electrons

Cr(0)

M = Cr