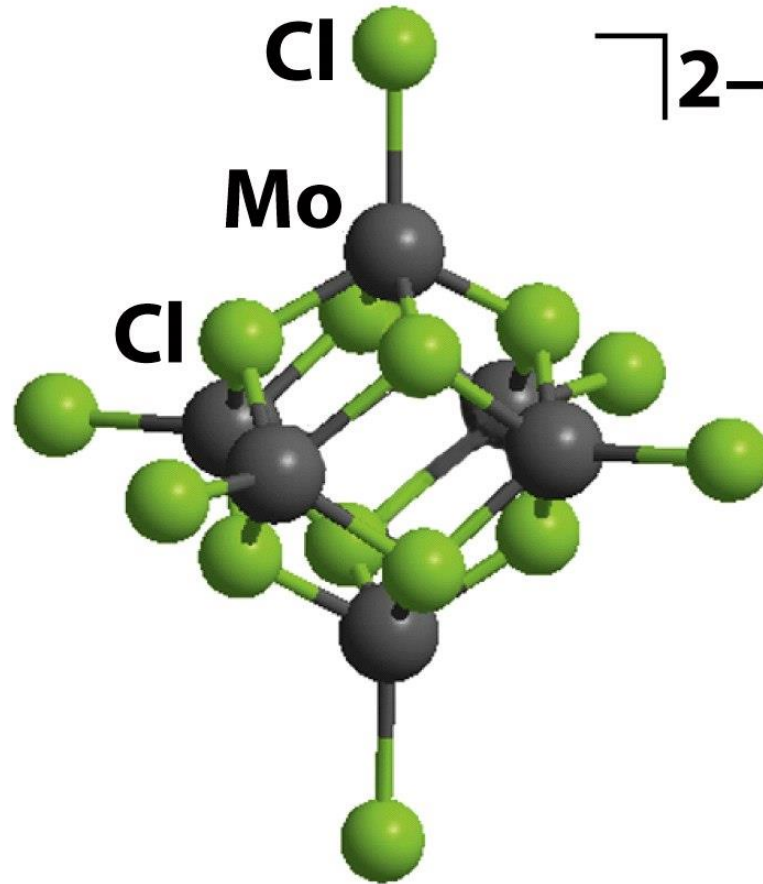
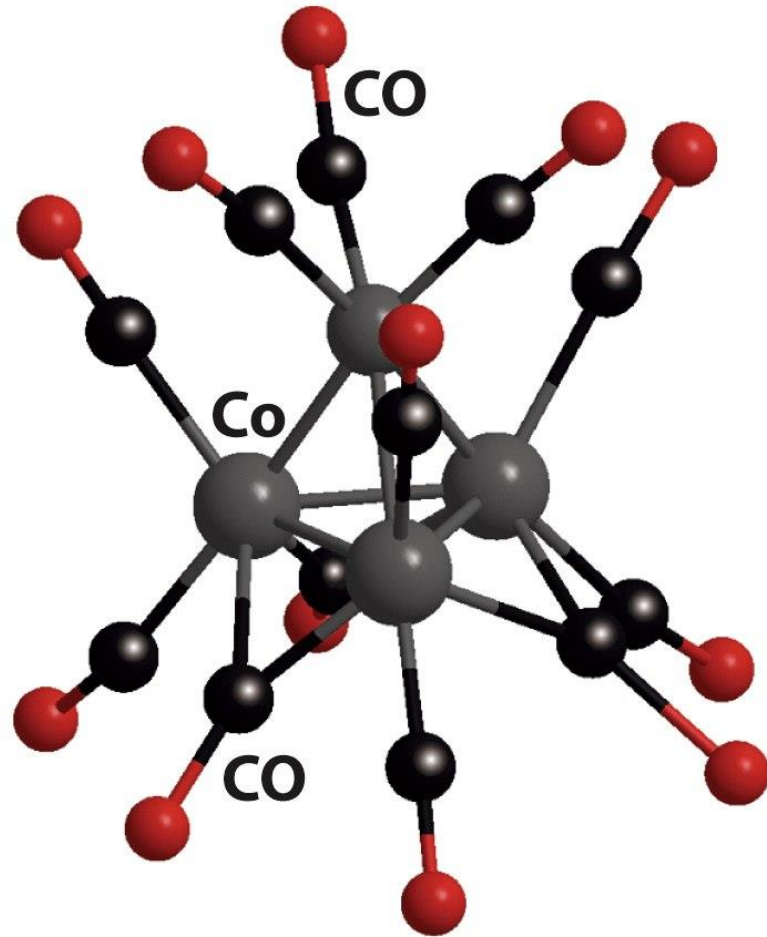


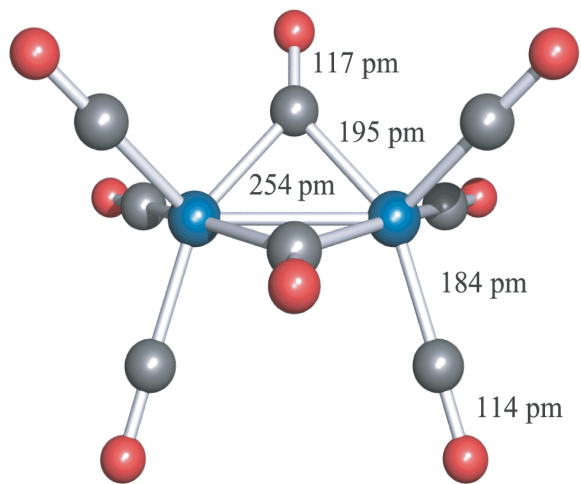
Cubane, C_8H_8

Composto a gabbia

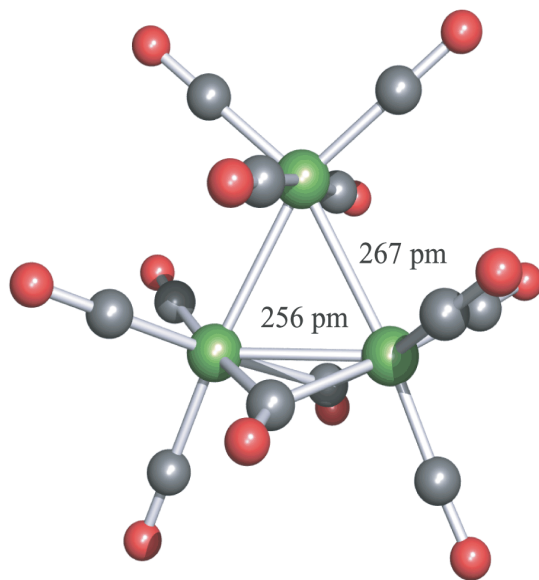
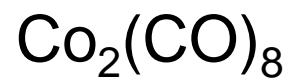


Cluster carbonilico

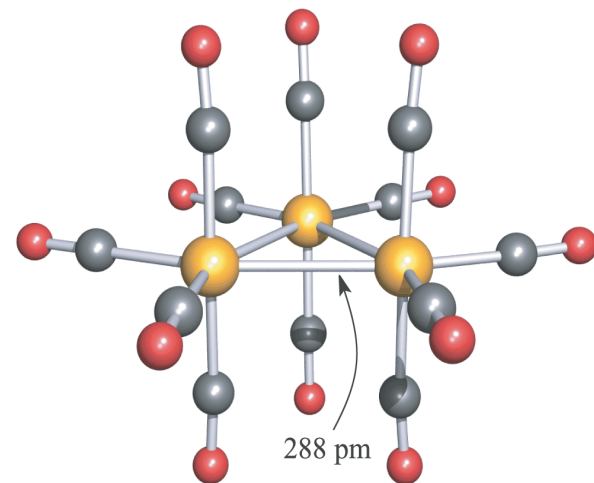
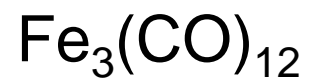




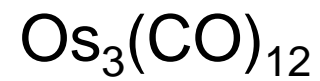
(d)

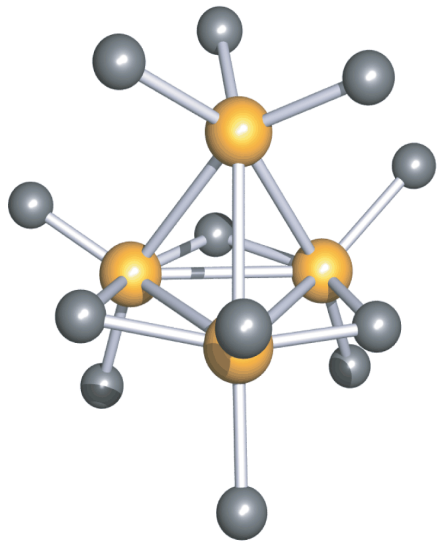


(e)

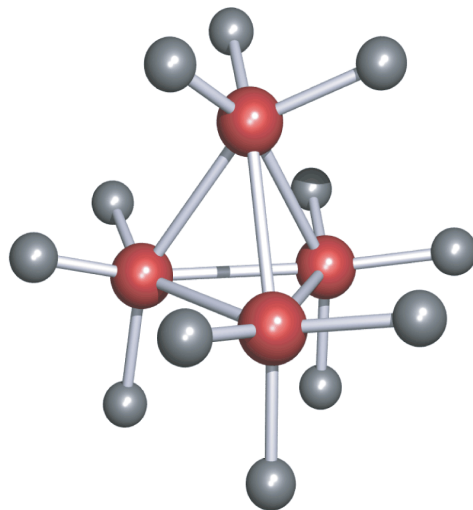
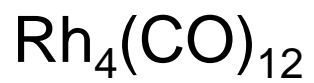


(f)

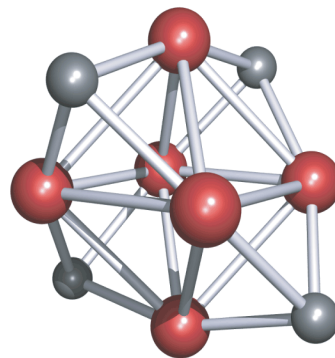




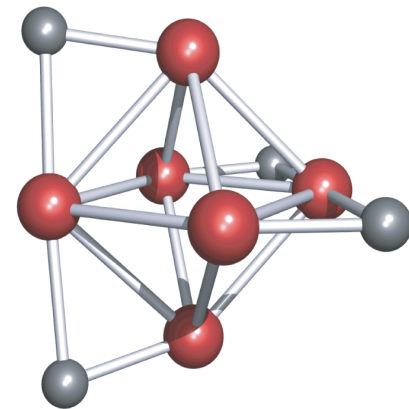
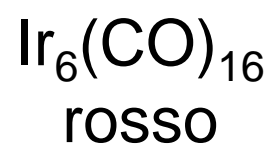
(a)



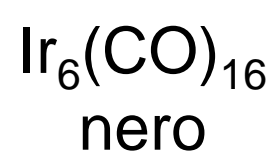
(b)

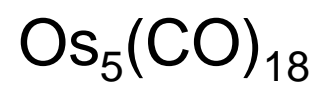
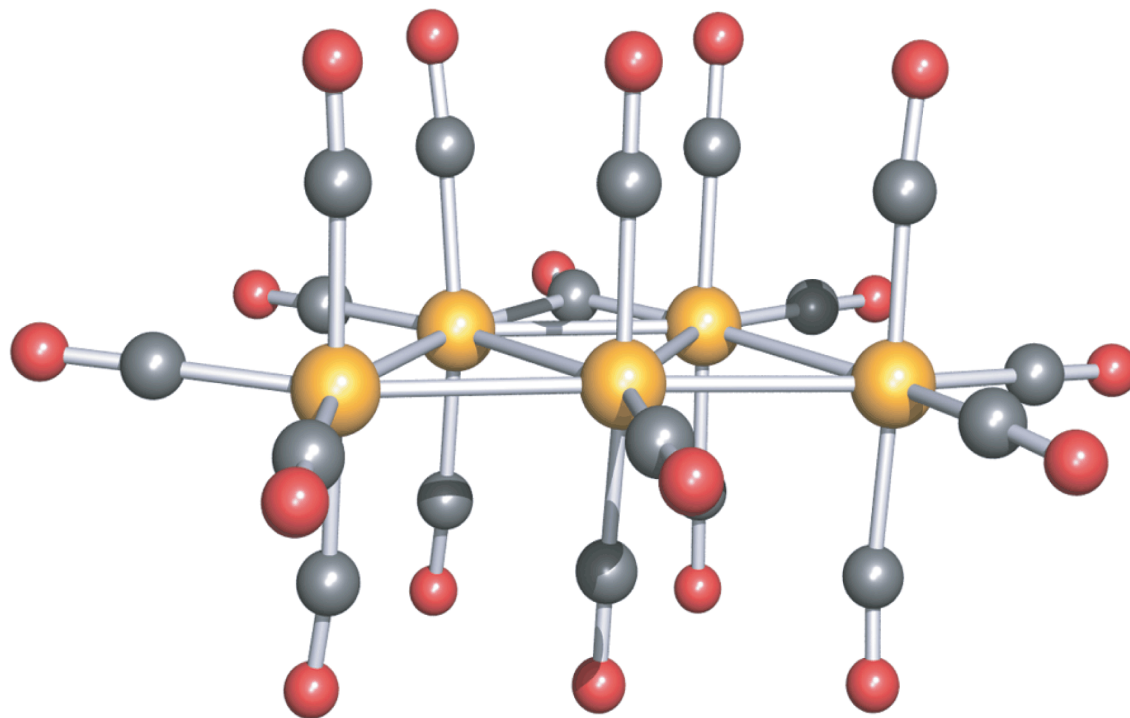


(c)





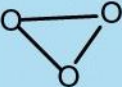


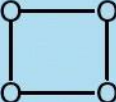
(d)





Elettroni di Valenza dei Cluster (CVE)

Table 21.9 Correlation of cluster valence electron (CVE) count and structure


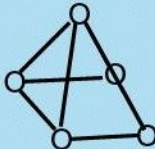


Number of metal atoms	Structure of metal framework	CVE count	Example
1	Single metal 	18	Ni(CO) ₄ (2)
2	Linear 	34	Mn ₂ (CO) ₁₀
3	Closed triangle 	48	[Co ₃ (CH)(CO) ₉] (78)
4	Tetrahedron 	60	Co ₄ (CO) ₁₂ (76)
	Butterfly 	62	[Fe ₄ (CO) ₁₂ C] ²⁻
	Square 	64	Os ₄ (CO) ₁₆

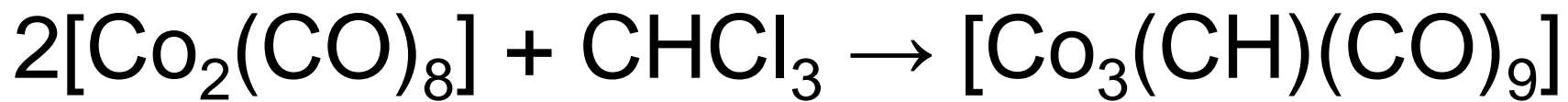
Regole di Wade – Mingos – Lauher

$$\text{CVE} = 18x - 2y$$

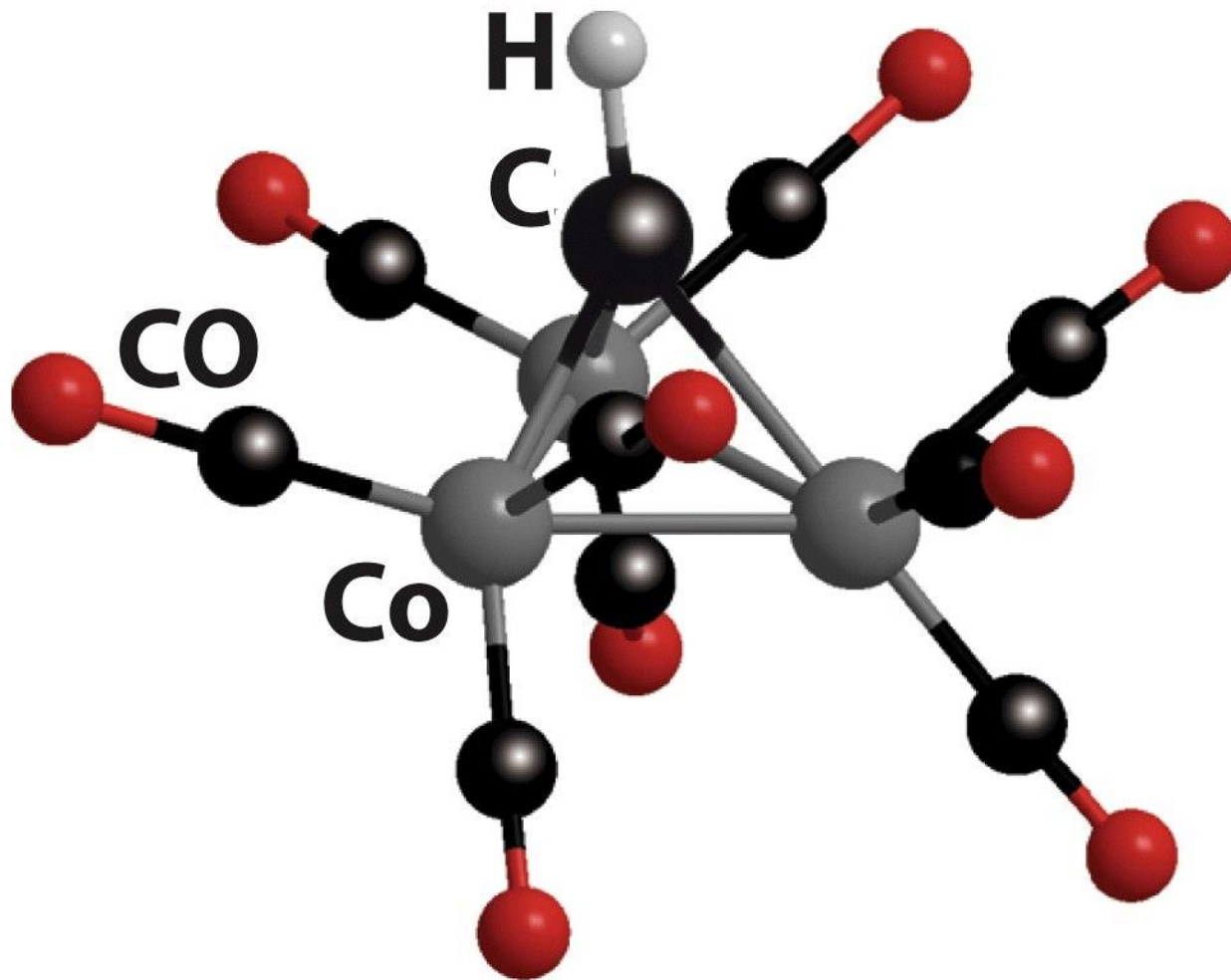
x atomi di metallo e y legami metallo-metallo

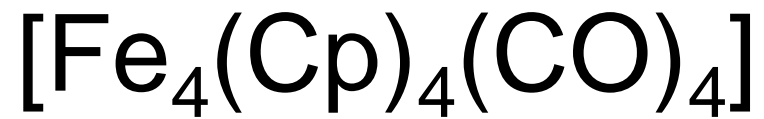
Table 21.9 Correlation of cluster valence electron (CVE) count and structure

Number of metal atoms	Structure of metal framework	CVE count	Example
5	Trigonal bipyramid 	72	$\text{Os}_5(\text{CO})_{16}$
	Square pyramid 	74	$\text{Fe}_5\text{C}(\text{CO})_{15}$
6	Octahedron 	86	$\text{Ru}_6\text{C}(\text{CO})_{17}$
	Trigonal prism 	90	$[\text{Rh}_6\text{C}(\text{CO})_{15}]^{2-}$



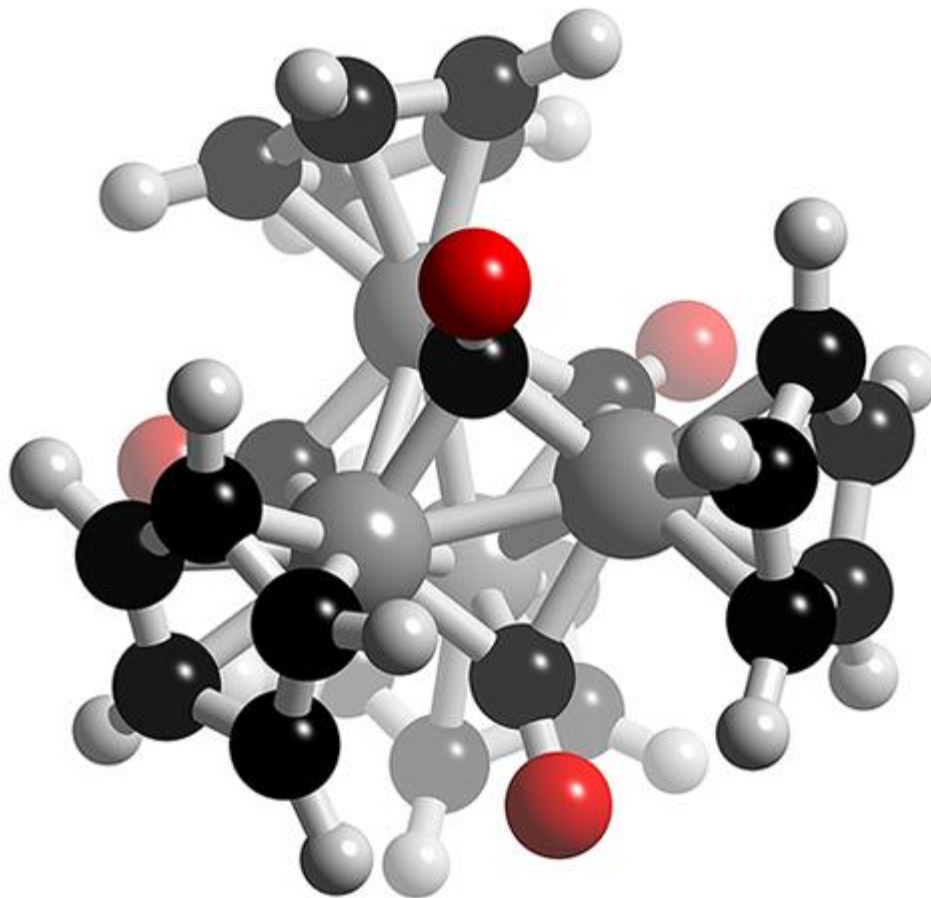
CVE = 48



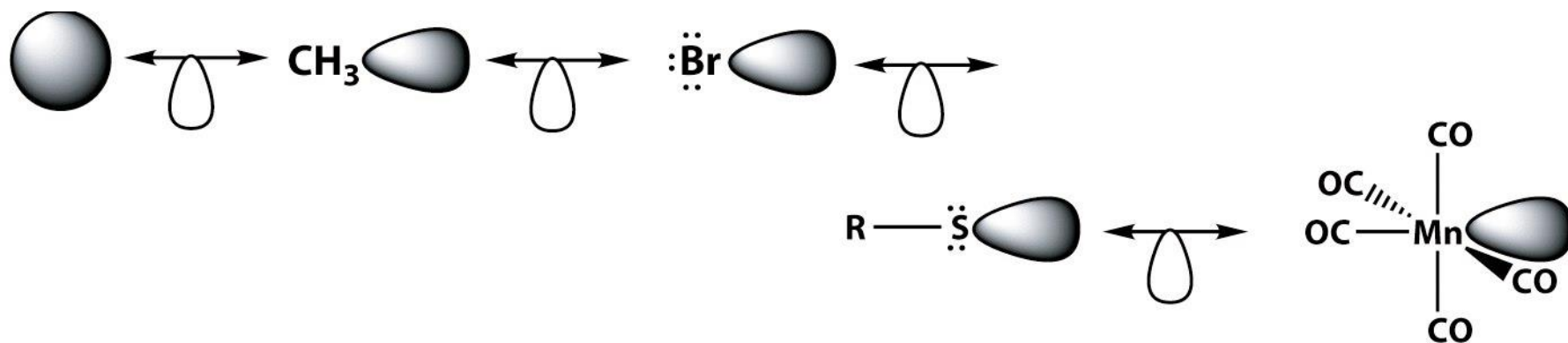


CVE = 60

ν_{CO} 1640 cm^{-1}



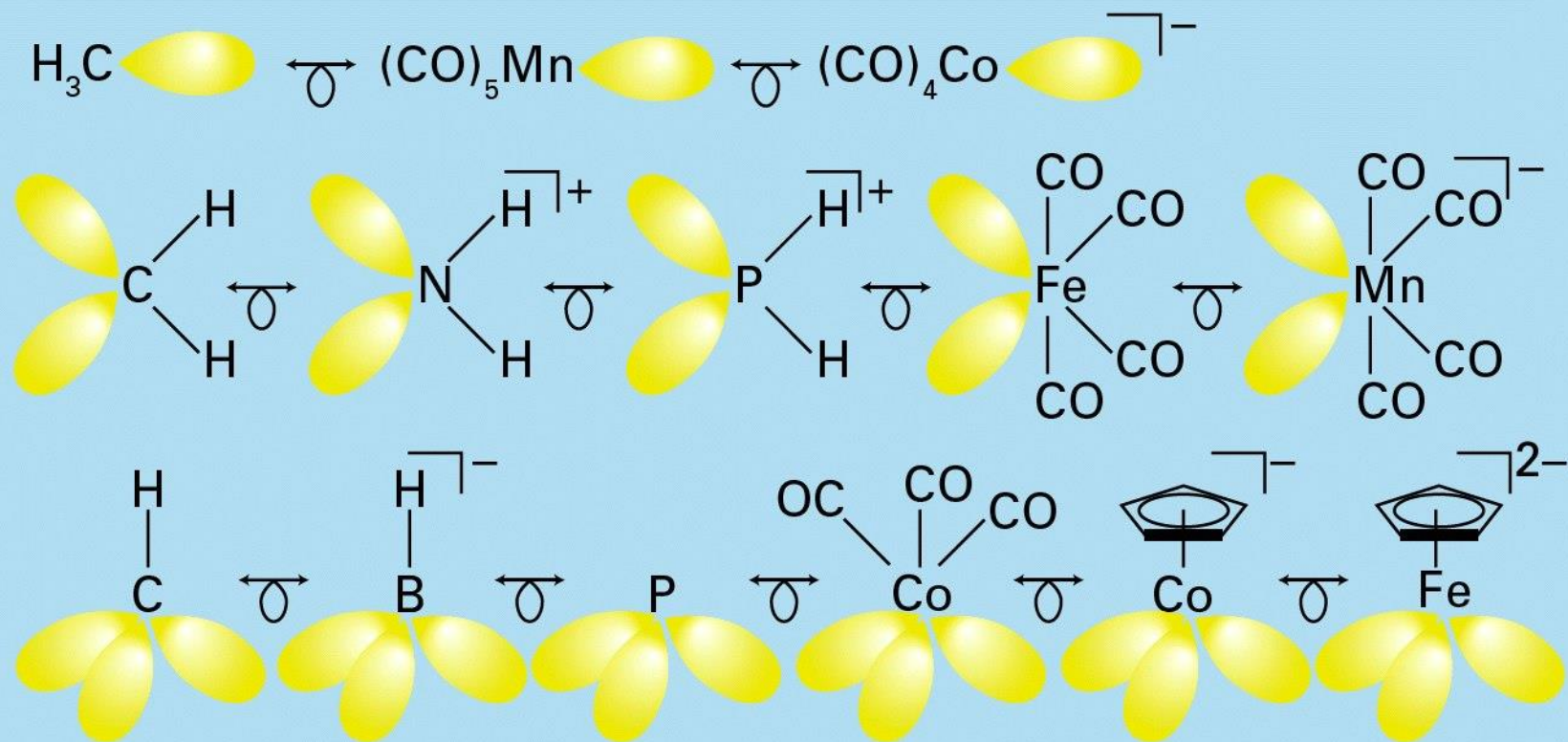
Serie di frammenti isolobali



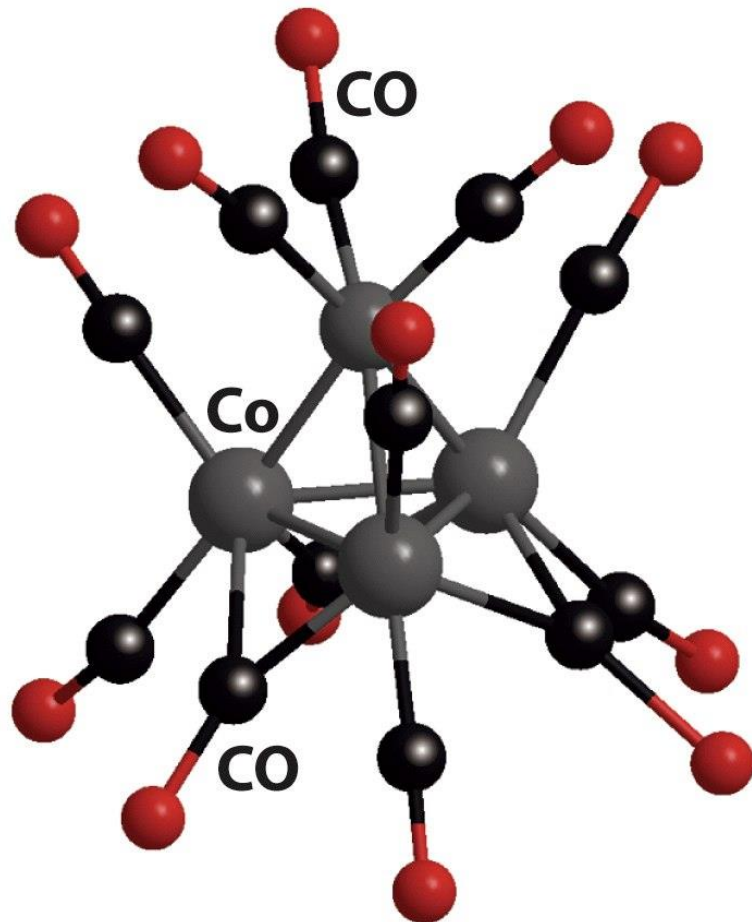
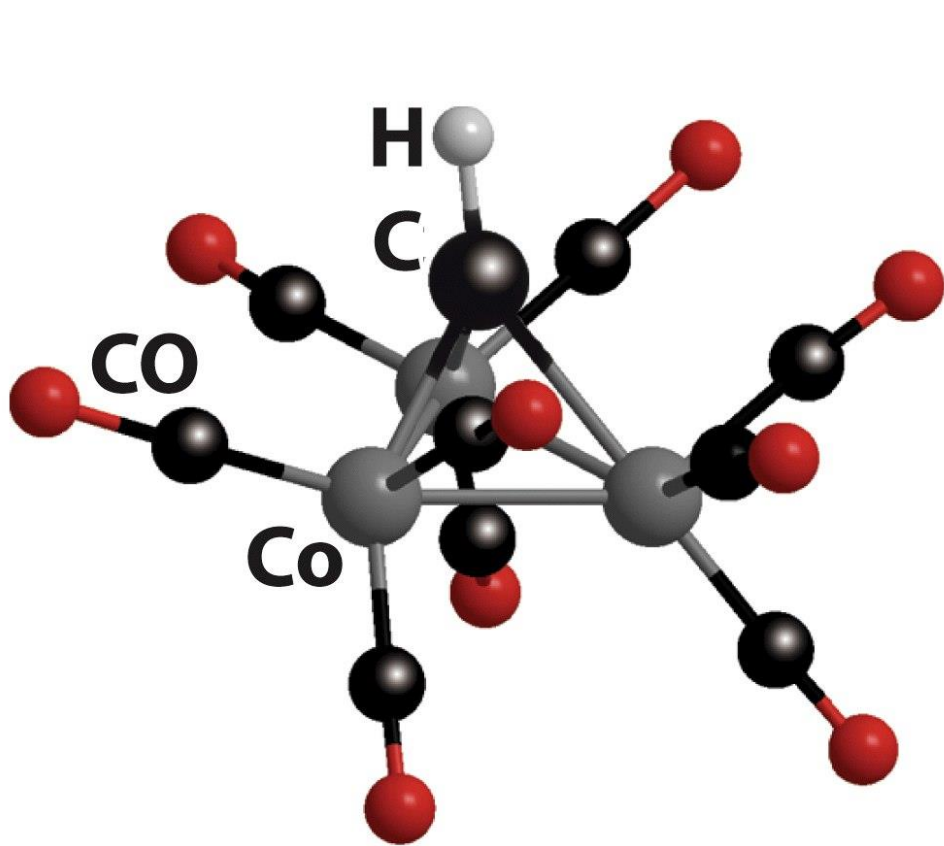
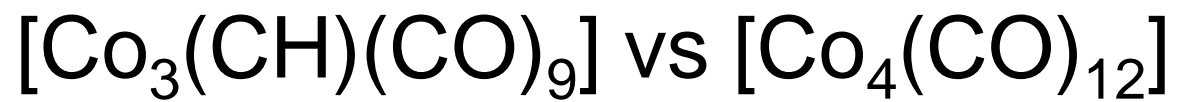
Gli **orbitali di frontiera** dei frammenti isolobali hanno:

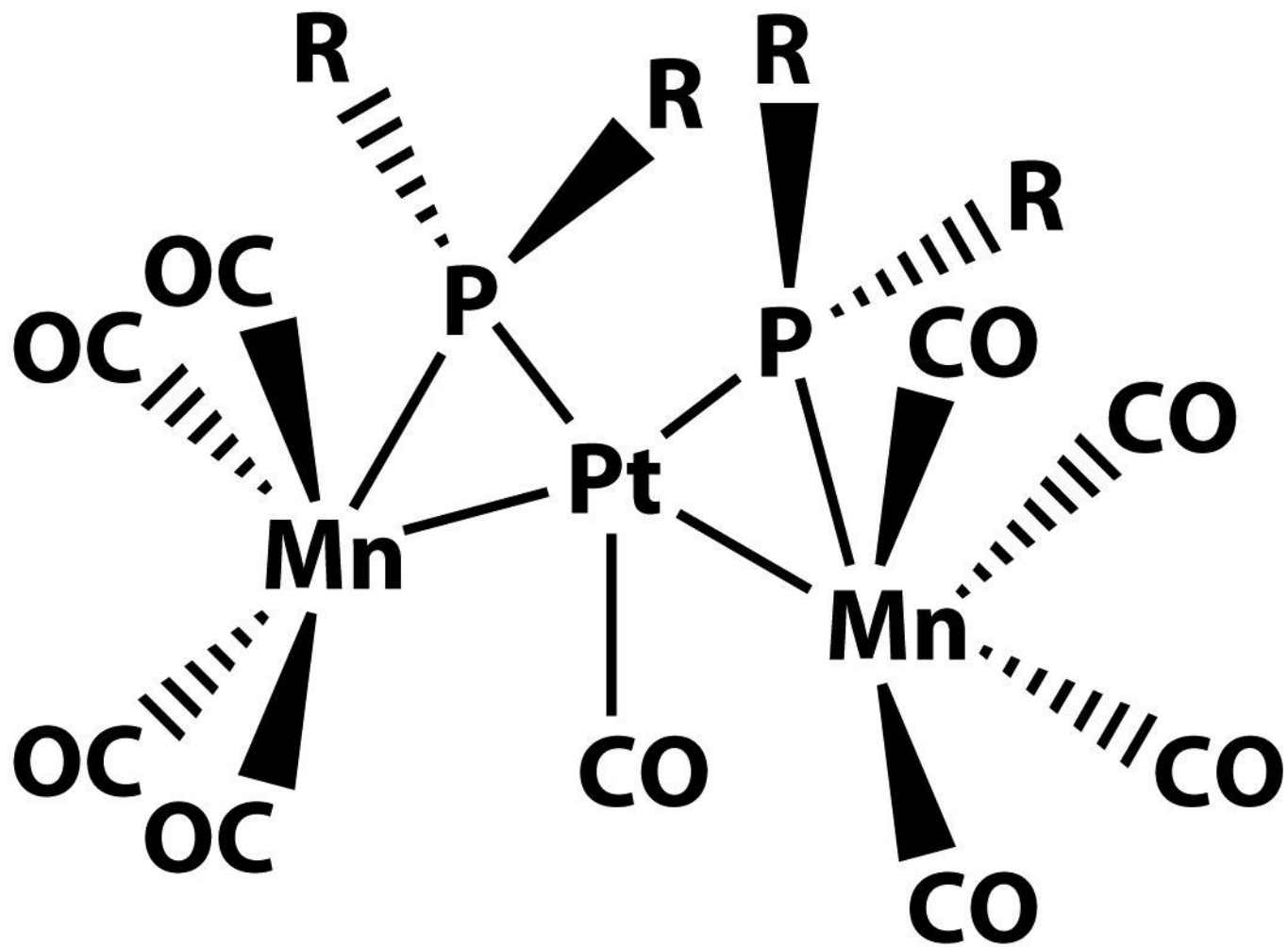
- stessa simmetria
- energie simili
- stessa occupazione elettronica

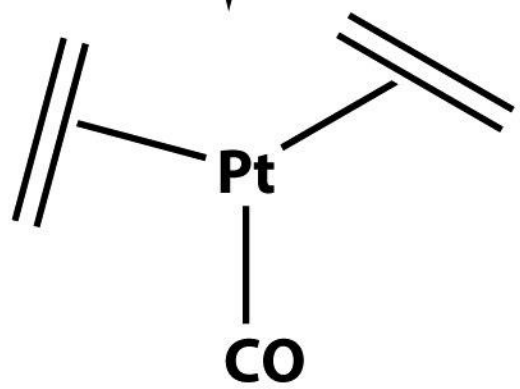
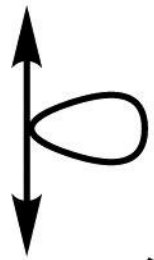
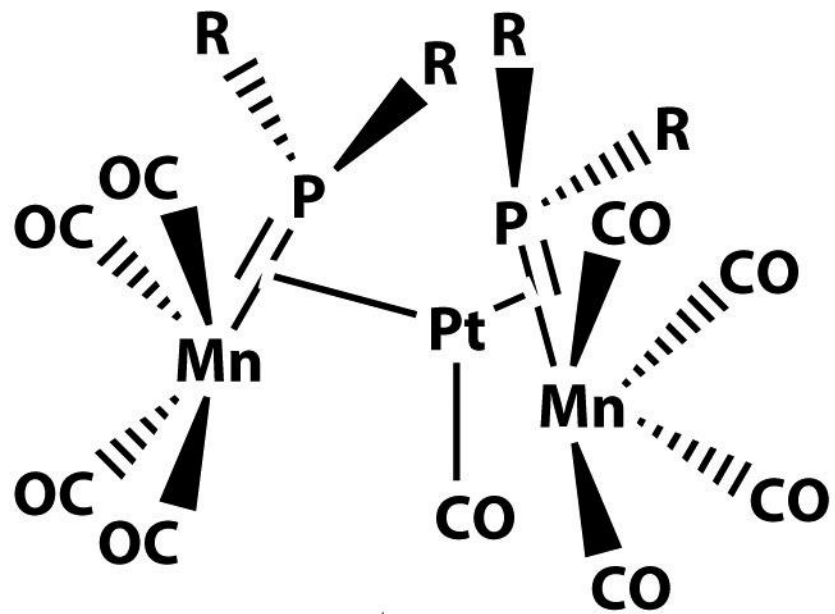
Table 21.10 Selected isolobal fragments

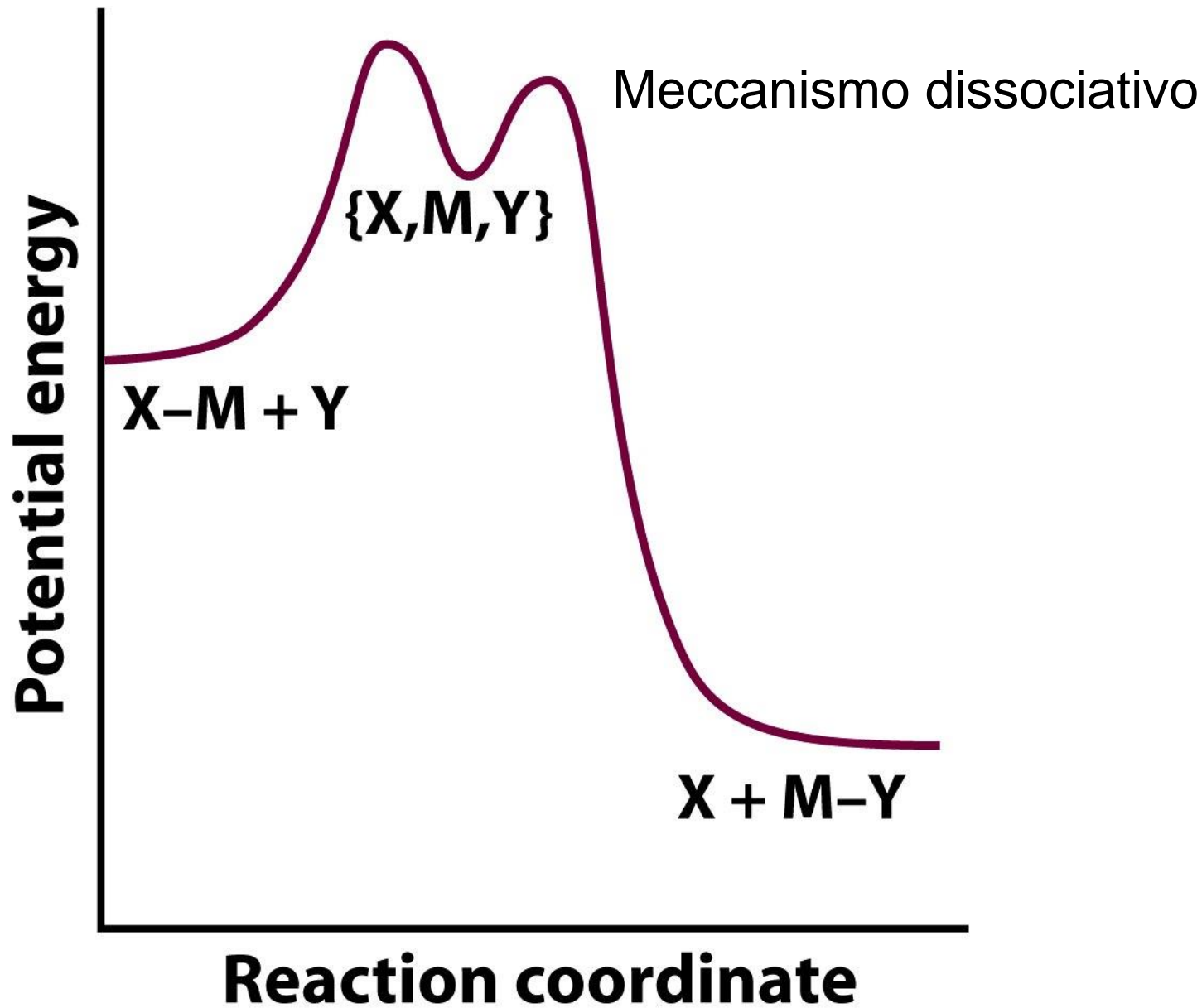


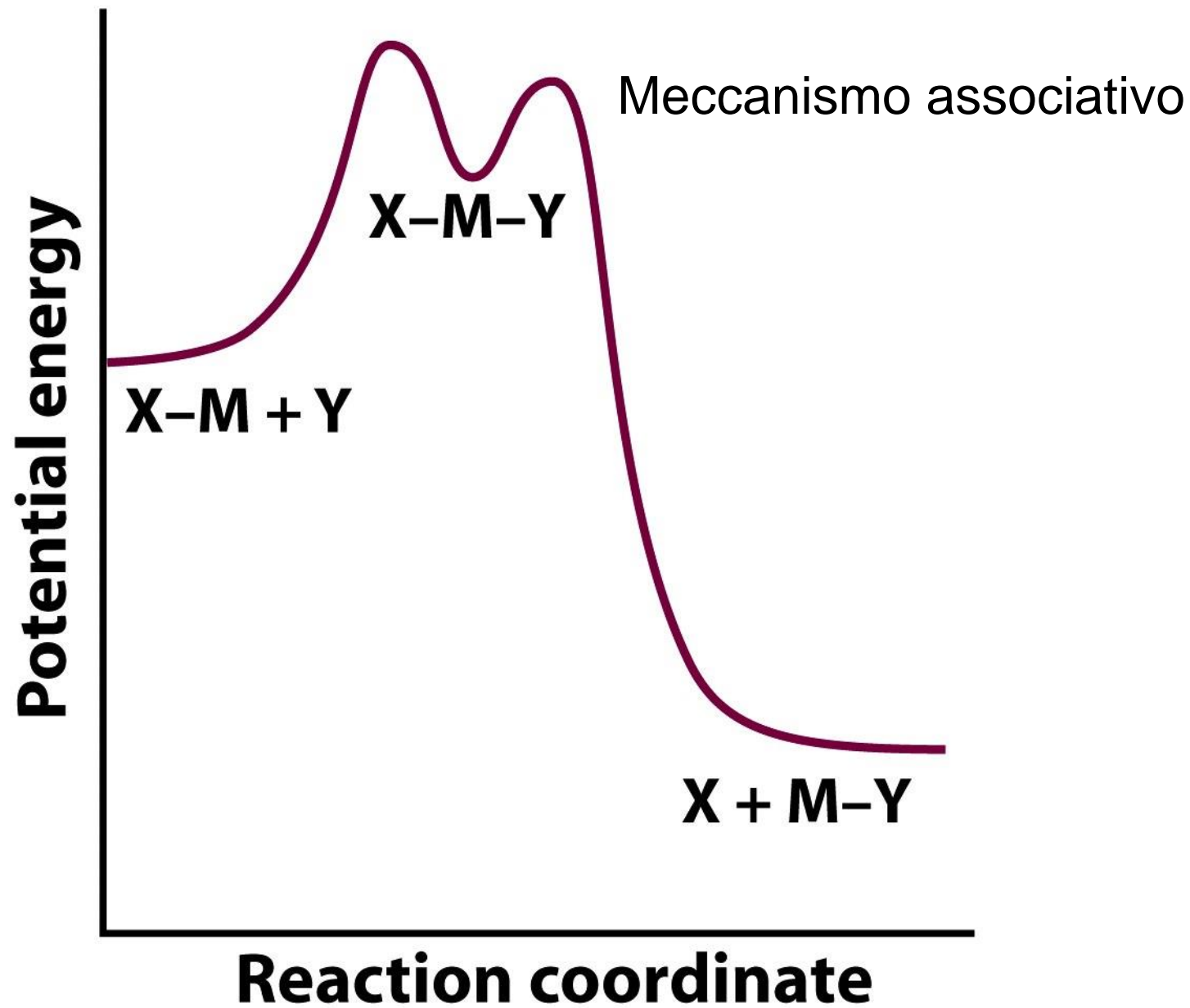
Note that electrons can be added to or subtracted from each member of the isolobal group and still maintain isolobality. For example, $\text{CH}_3^+ \longleftrightarrow \text{Mn}(\text{CO})_5^+ \longleftrightarrow \text{Co}(\text{CO})_4$.

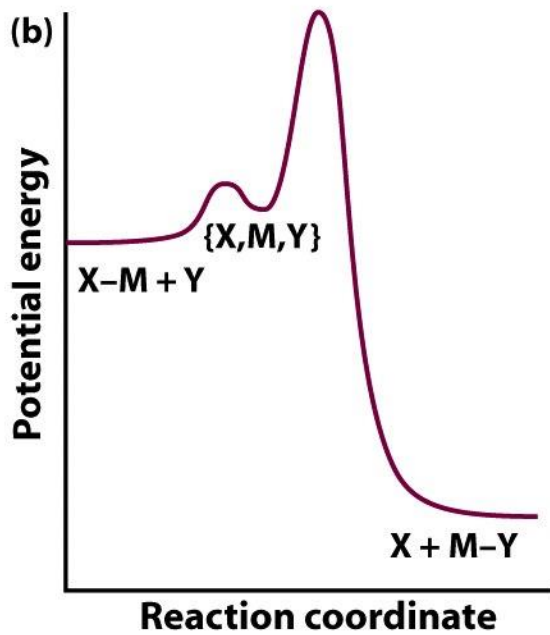
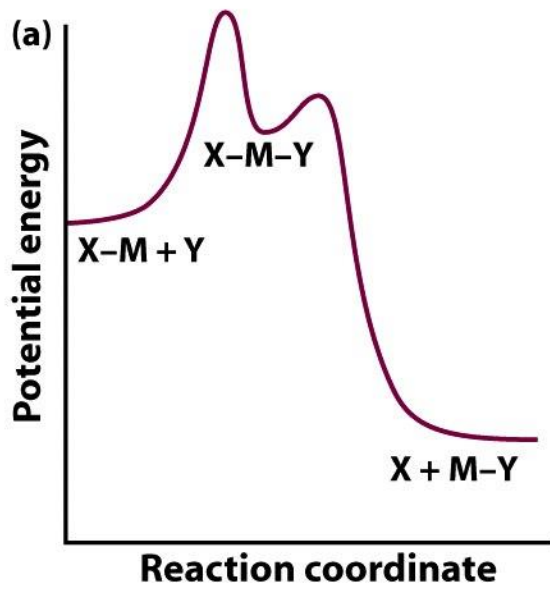




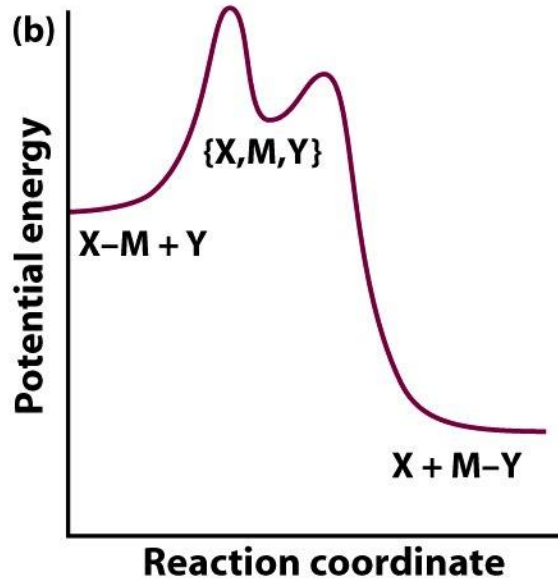
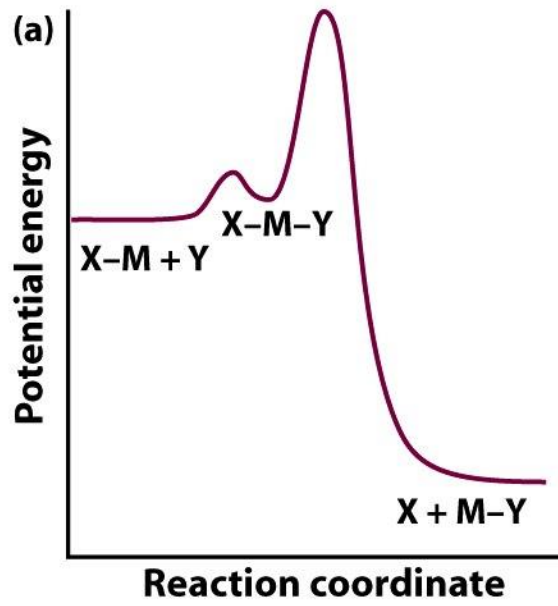




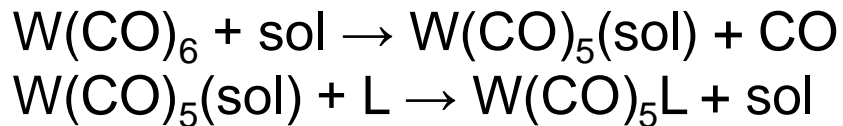
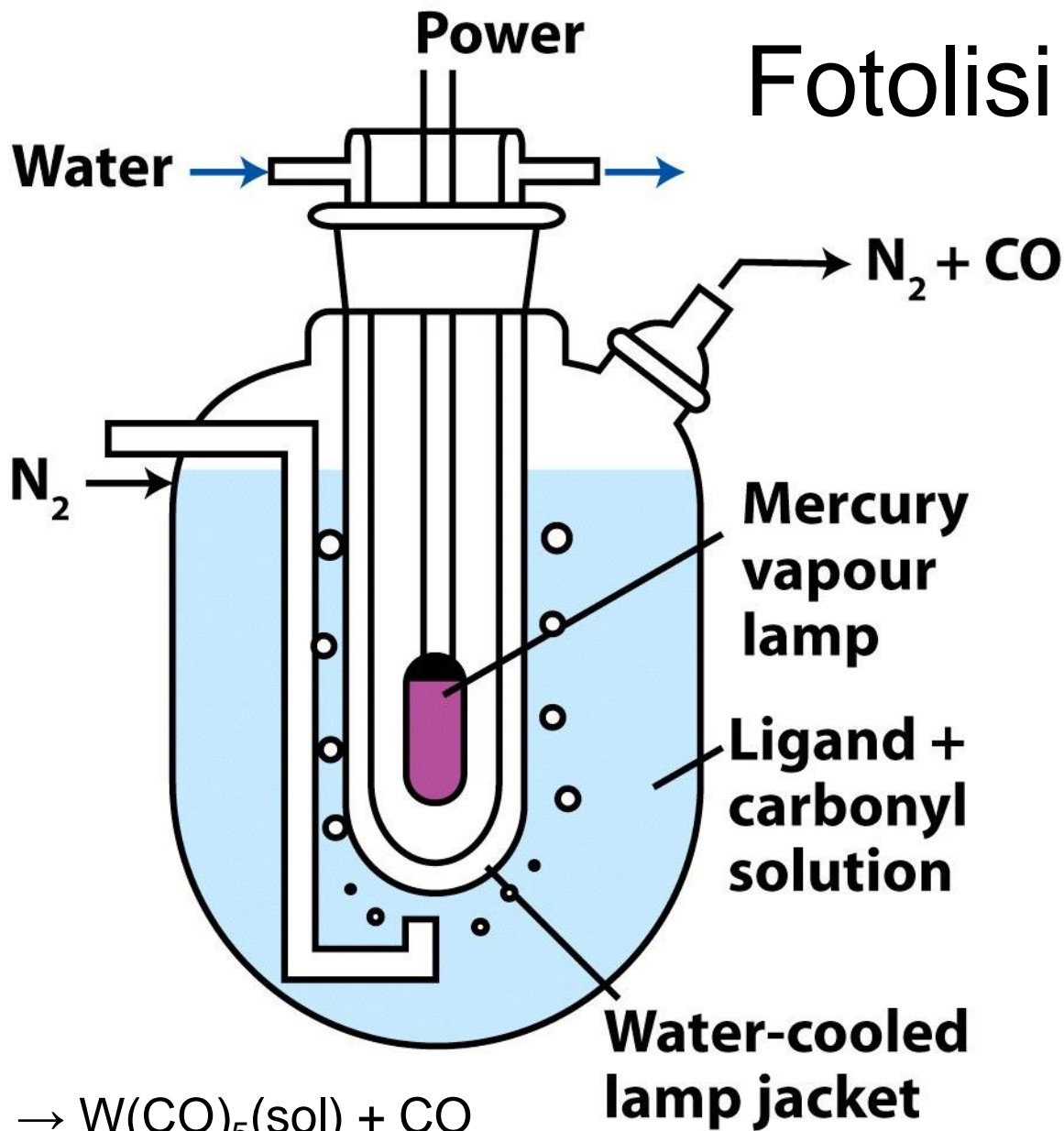




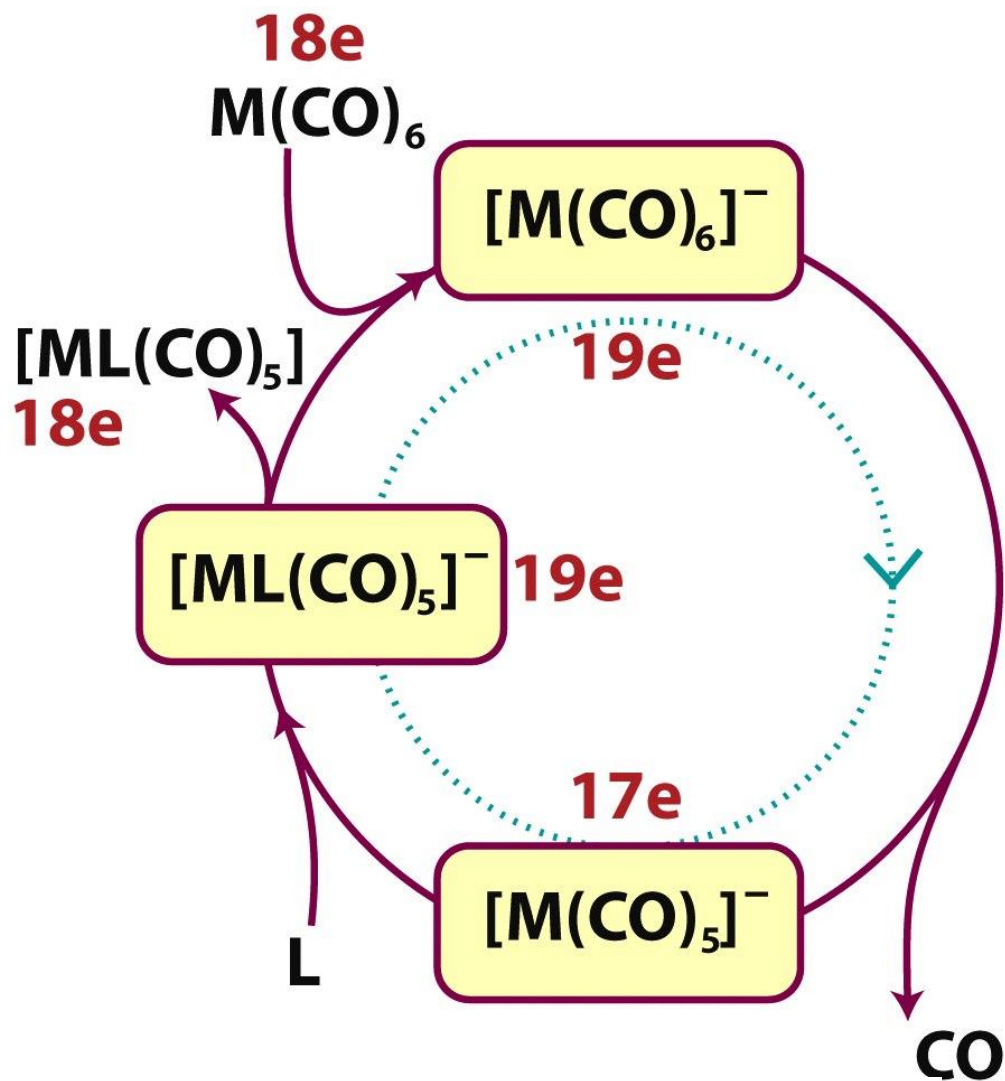
Attivazione di tipo associativo



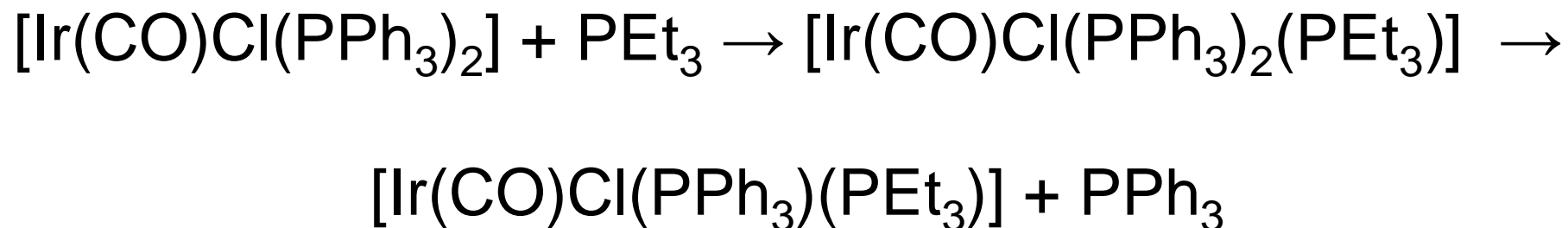
Attivazione di tipo dissociativo



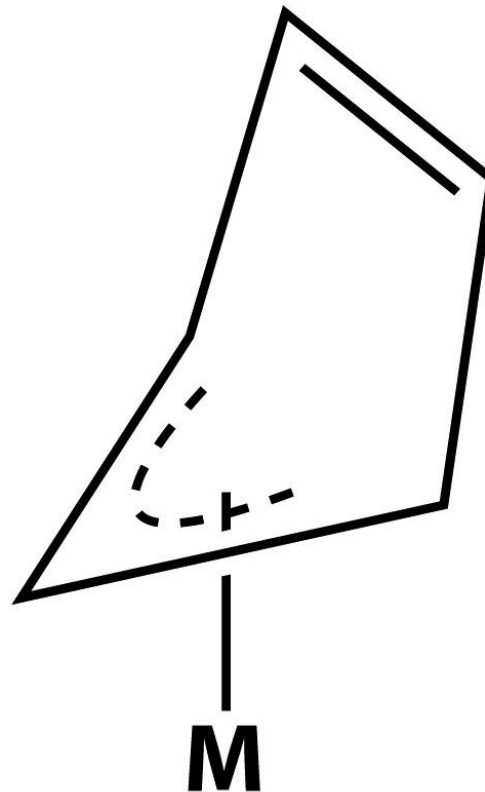
Sostituzione indotta da un processo redox



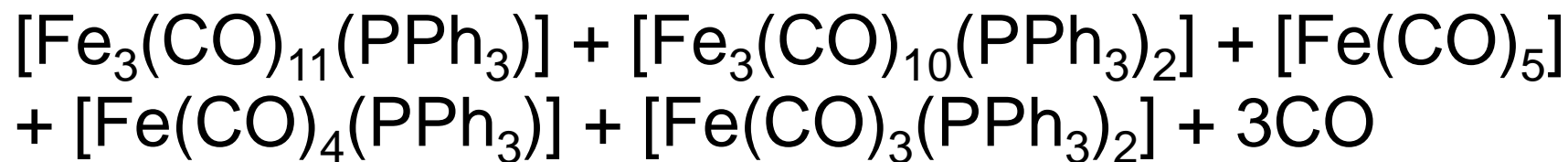
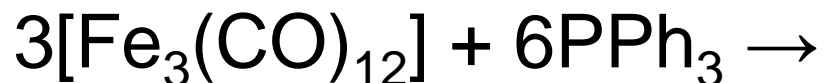
16e: meccanismo associativo



Sostituzioni con meccanismo associativo in complessi con 18 elettroni

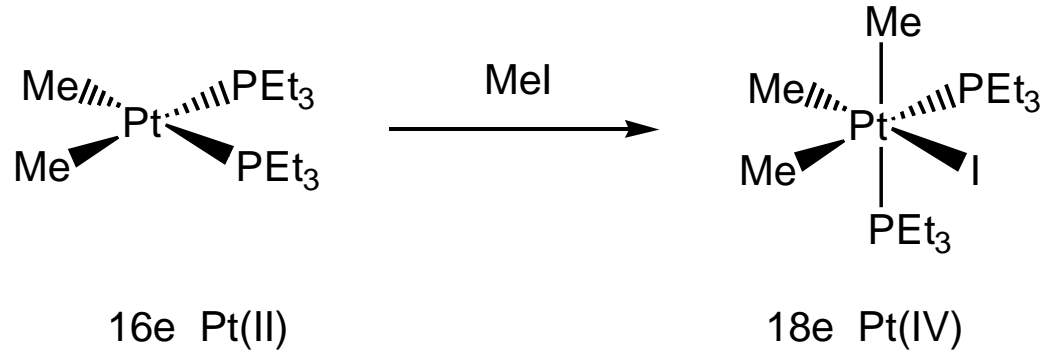


Sostituzione dei leganti in un cluster

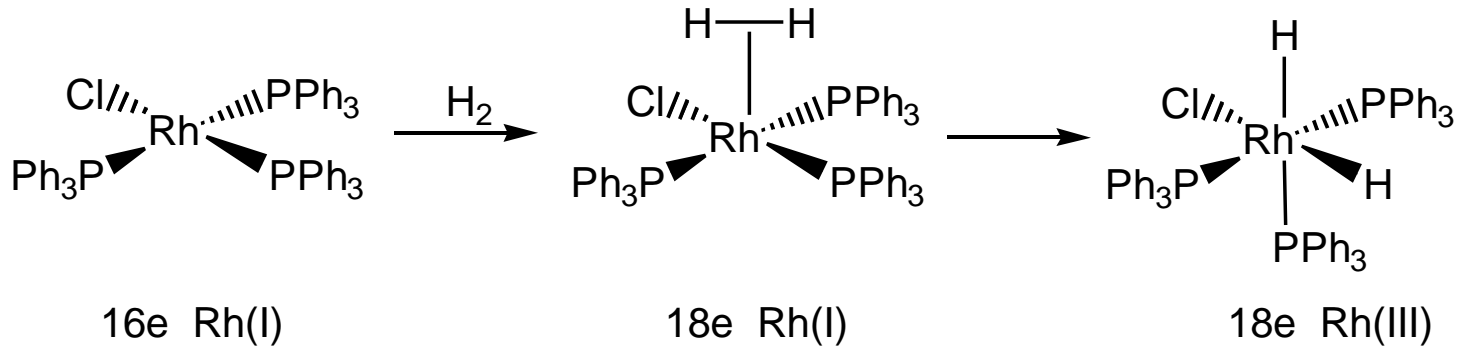


La stabilità dei legami metallo-metallo, e quindi dei cluster, aumenta scendendo in un gruppo.

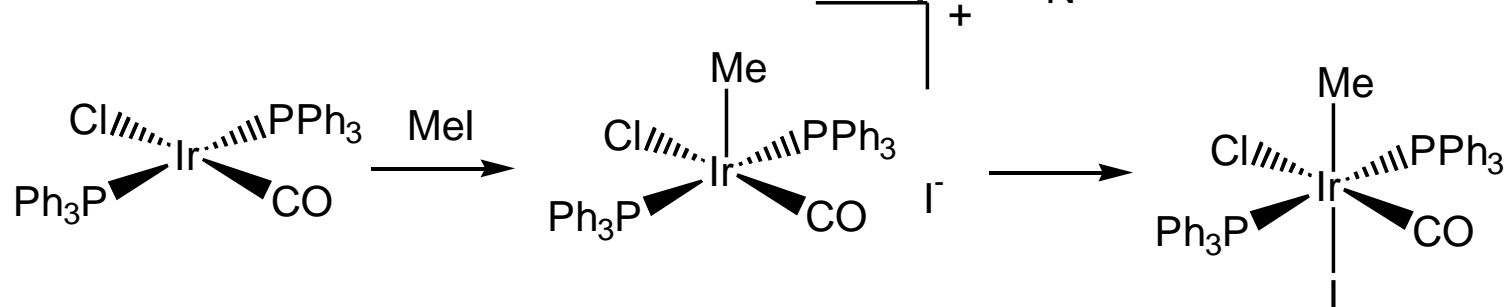
Addizione ossidativa



Meccanismo concertato

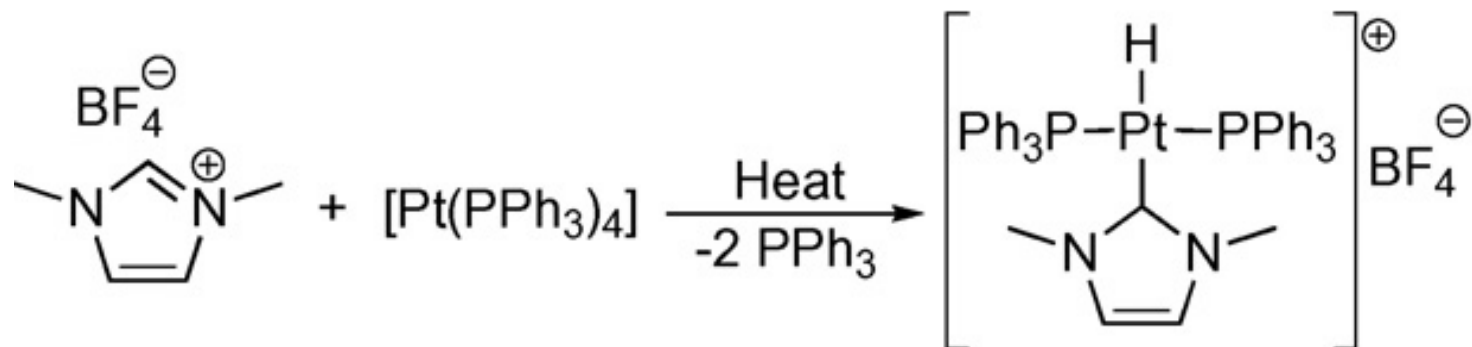


Meccanismo di tipo S_N2

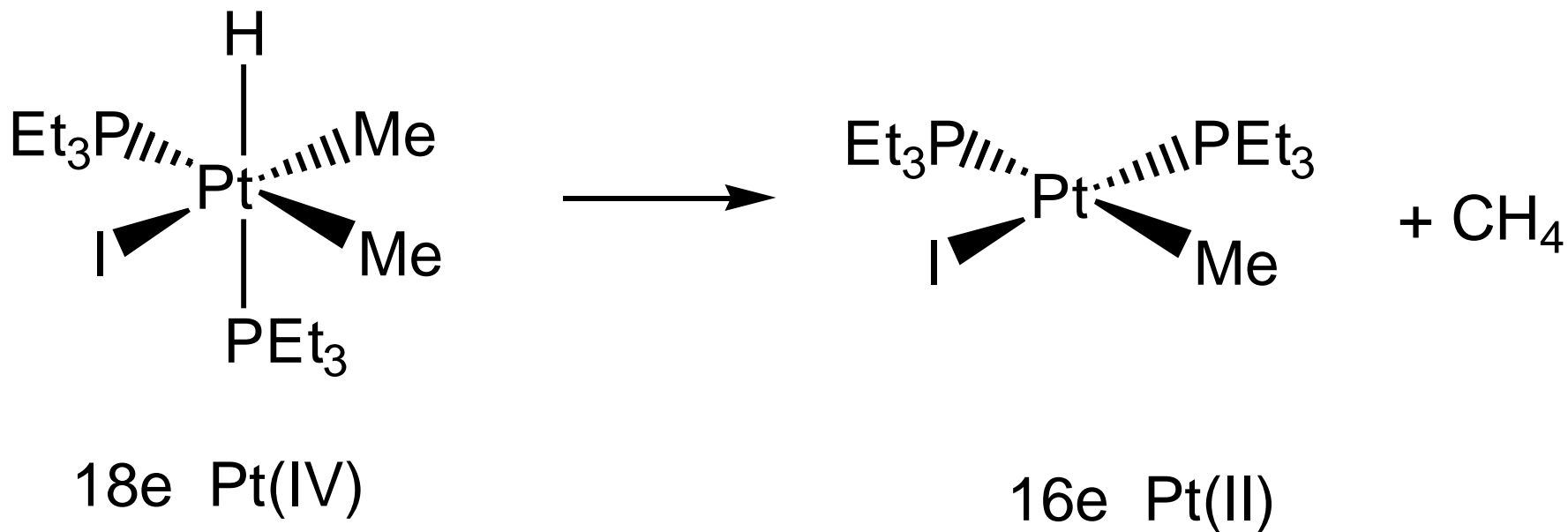


Caso anomalo di addizione ossidativa

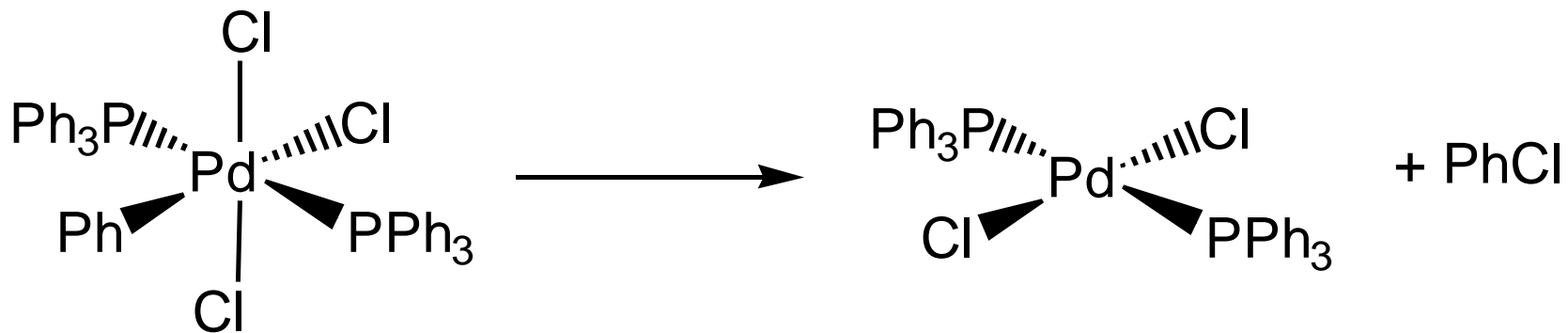
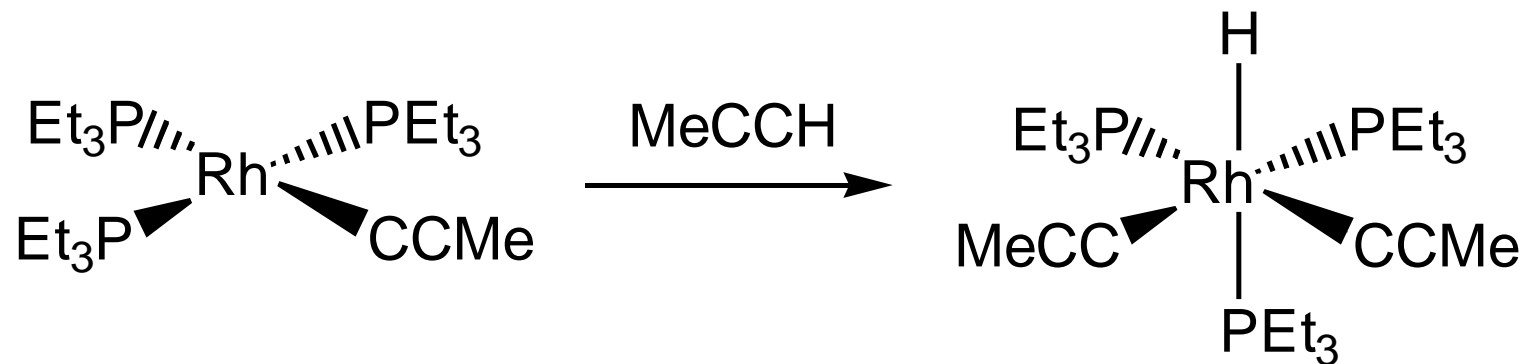
addizione ossidativa di sali di imidazolio su precursori zerovalenti



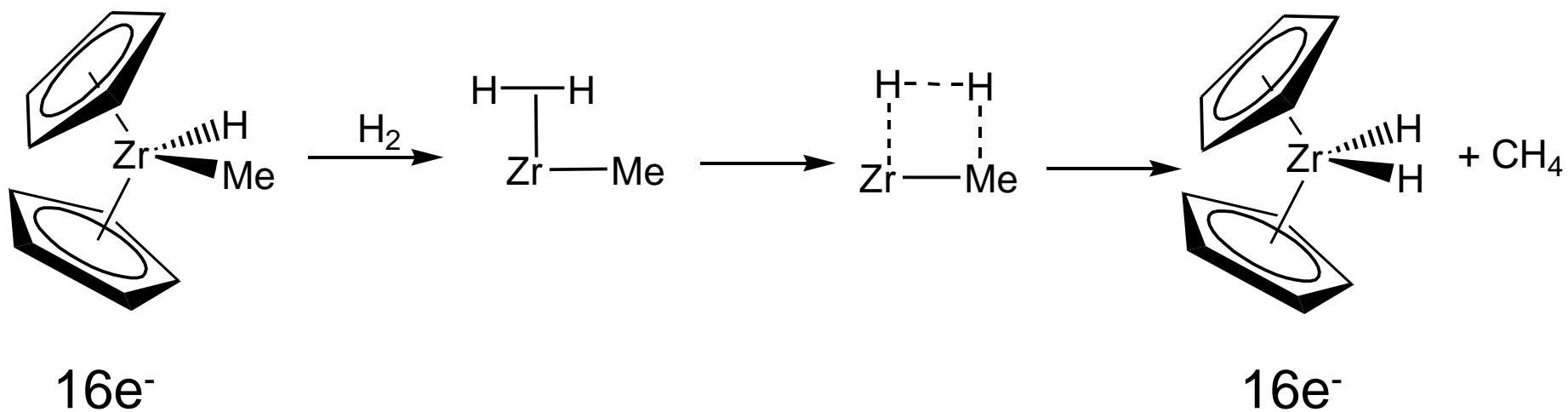
Eliminazione riduttiva



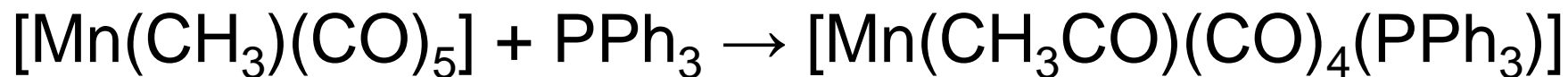
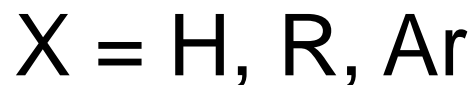
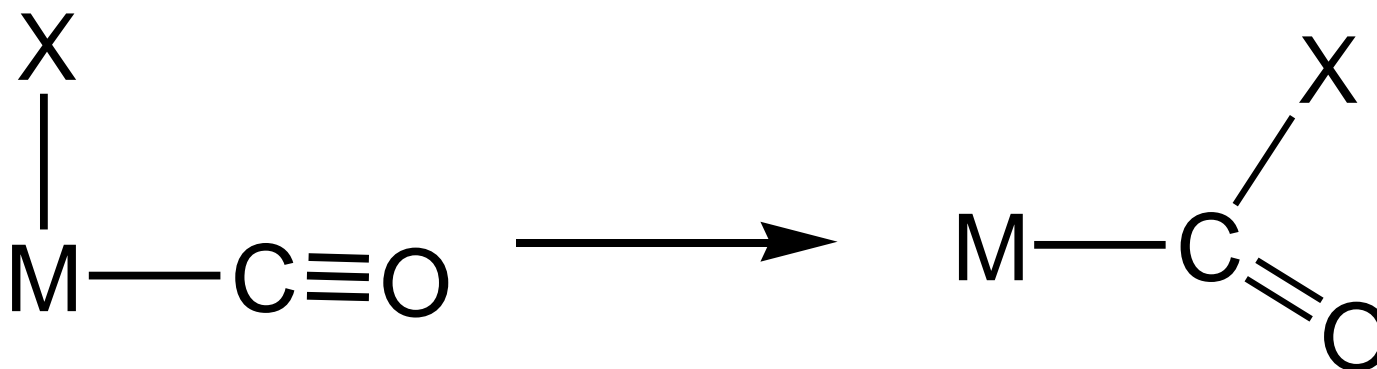
Esempi



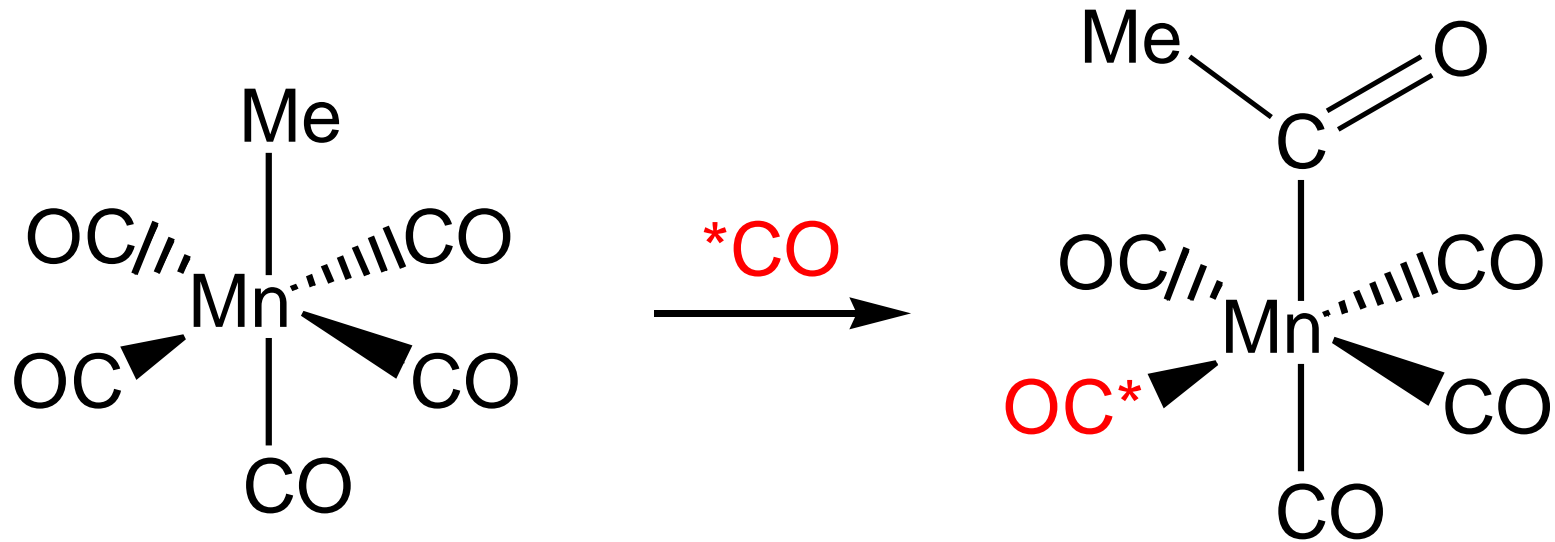
Metatesi di legame σ



Inserzione migratoria 1,1

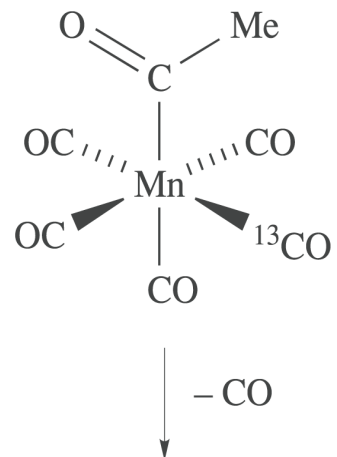


Meccanismo dell'inserzione migratoria 1,1

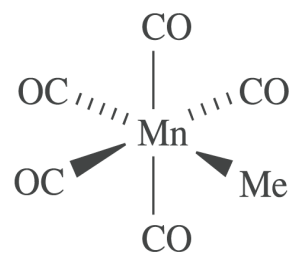
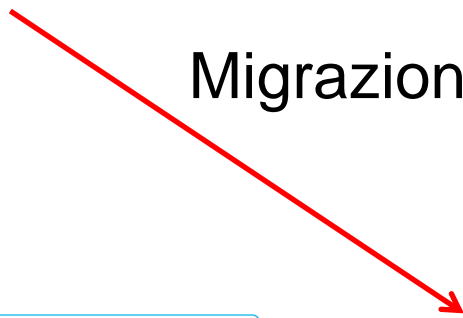


Reazione inversa



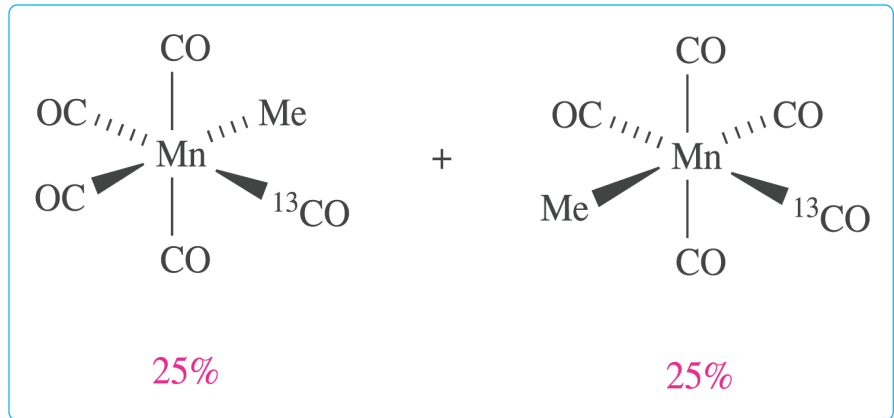


Migrazione Me



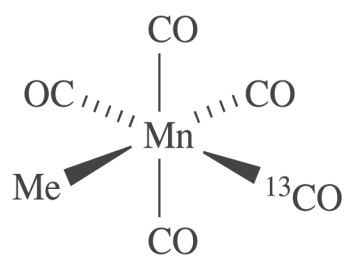
25%

+



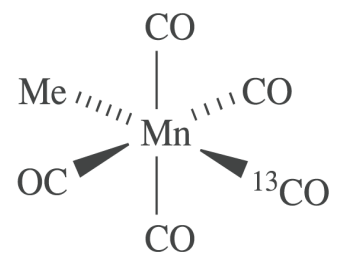
25%

+



25%

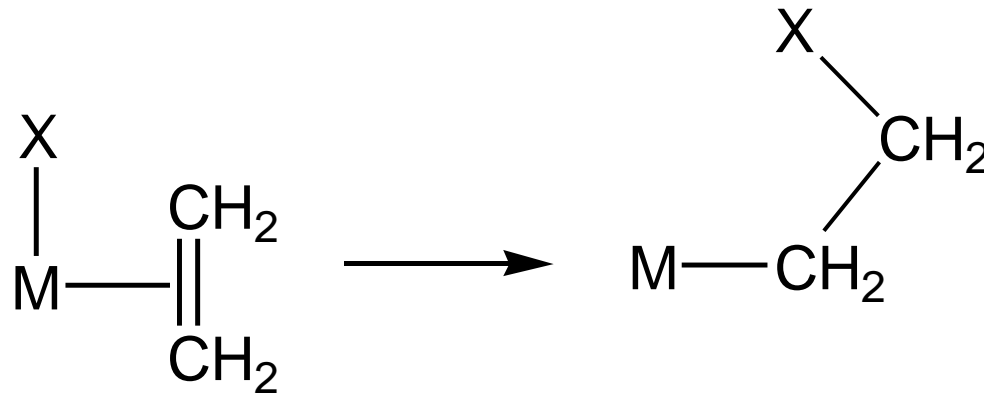
+



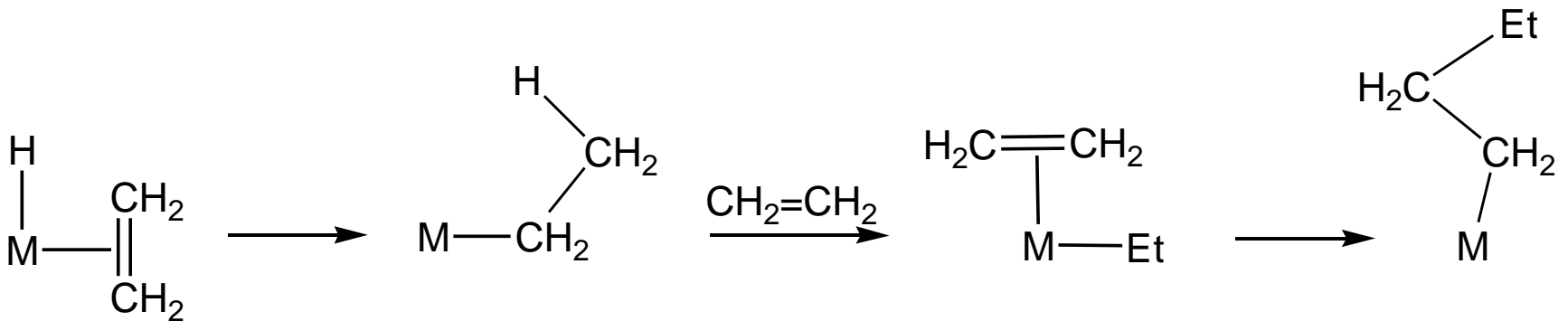
25%

Equivalent products

Inserzione 1,2 *con leganti coordinati η^2*

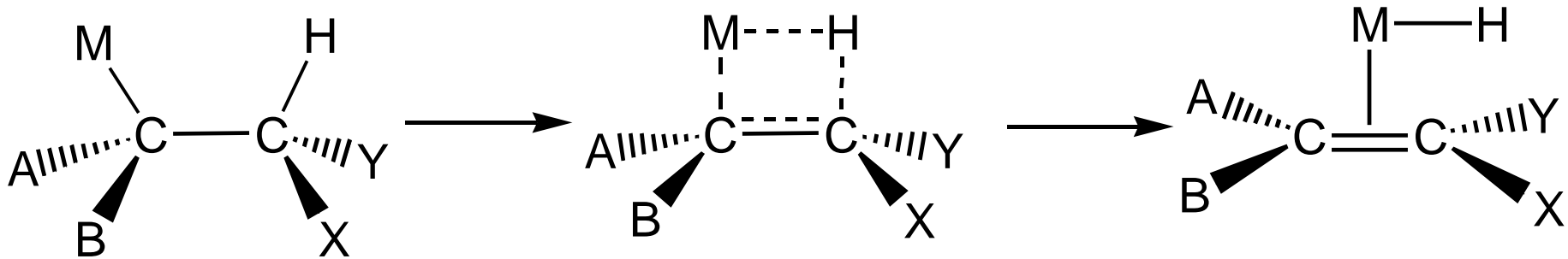
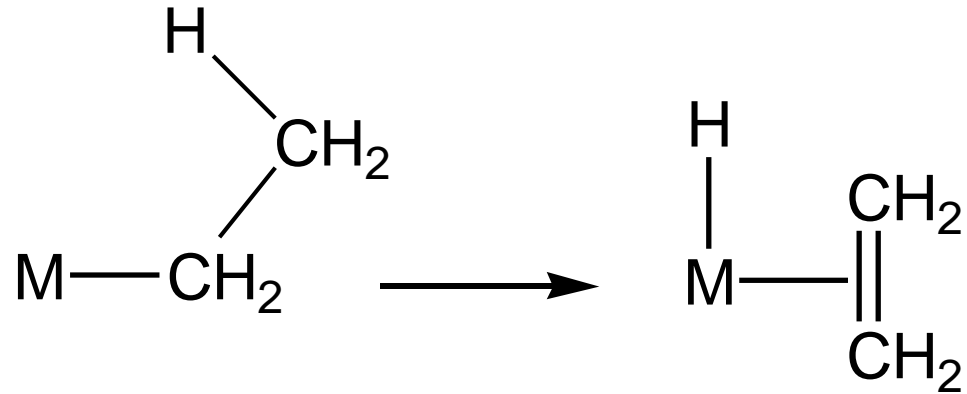


$X = \text{H}, \text{R}, \text{Ar}$



Formazione di polietilene

β -eliminazione di idruro



Intermedio *syn*

Isomerizzazione di alcheni

