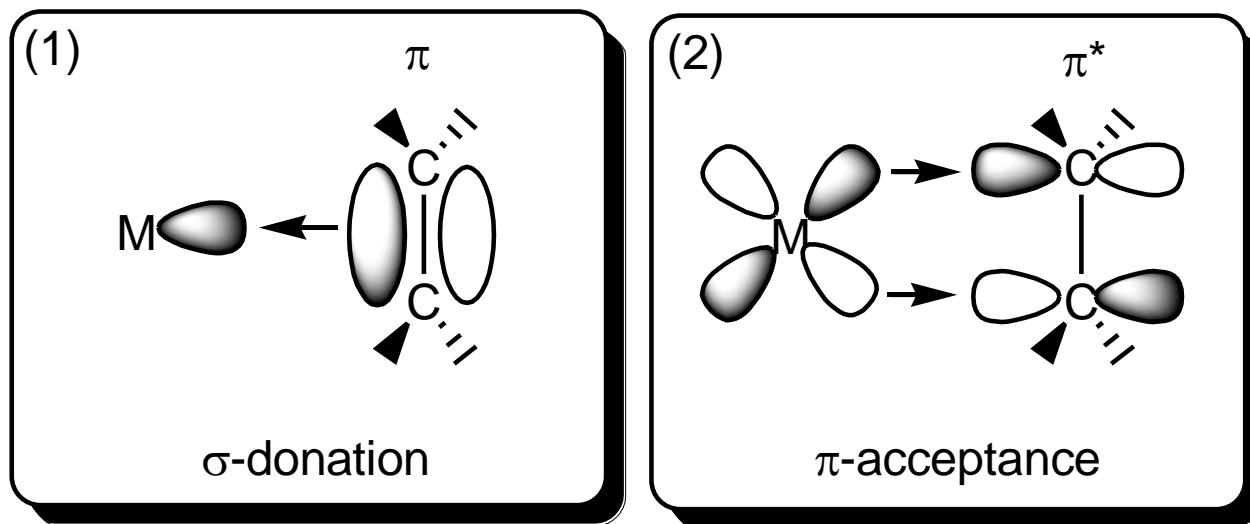


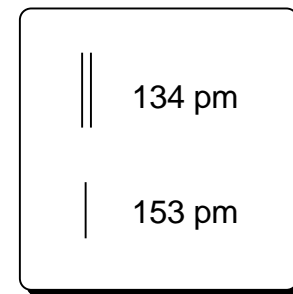
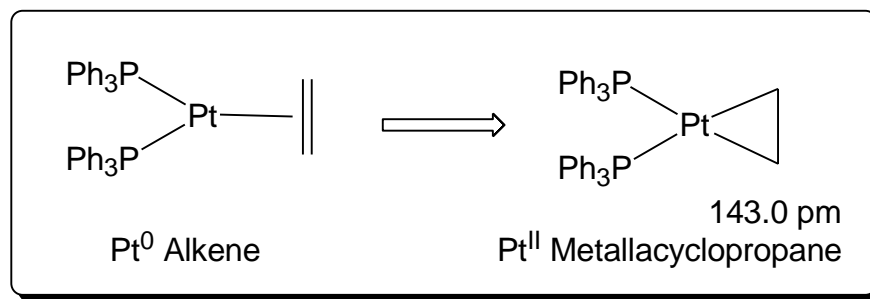
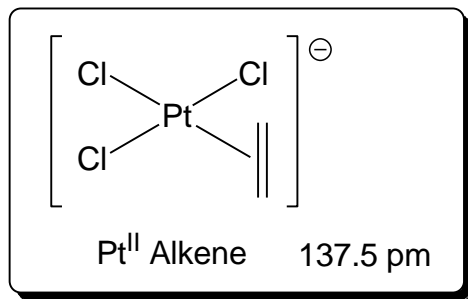
Alkene complexes: Dewar-Chatt-Duncanson Bonding Model



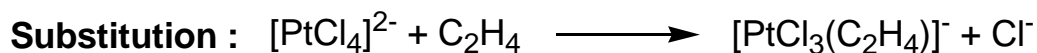
- Synergic Bonding
- Both σ -donation and π -acceptance weakens the CC bond

Alkene Complexes

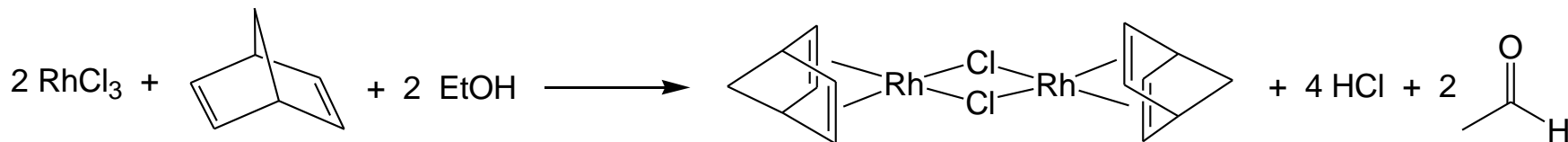
Alkene versus Metallacyclopropane Complex



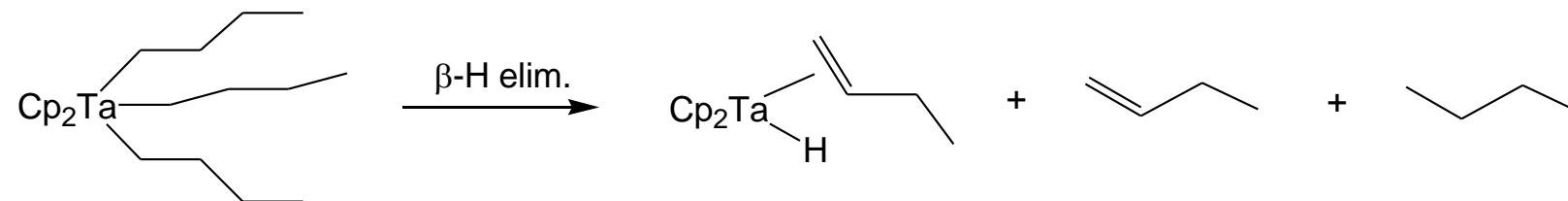
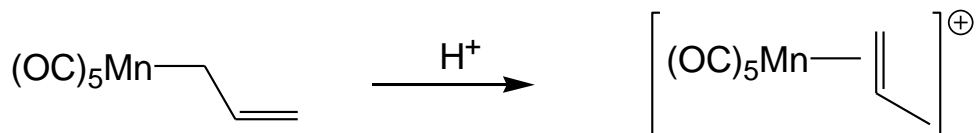
Synthesis of Alkene Complexes



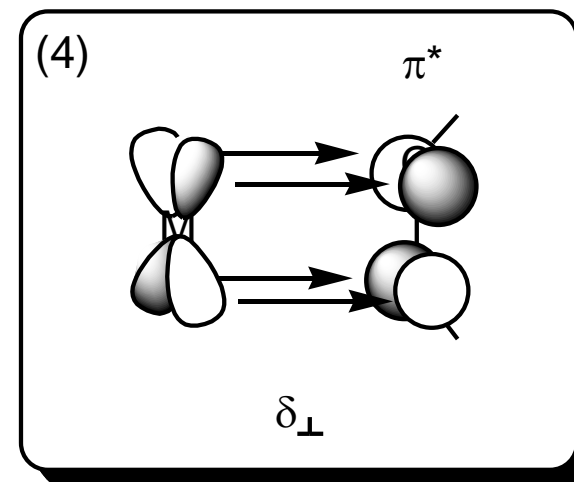
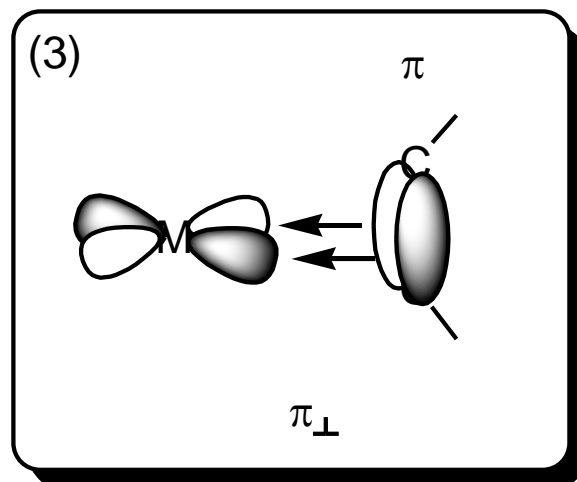
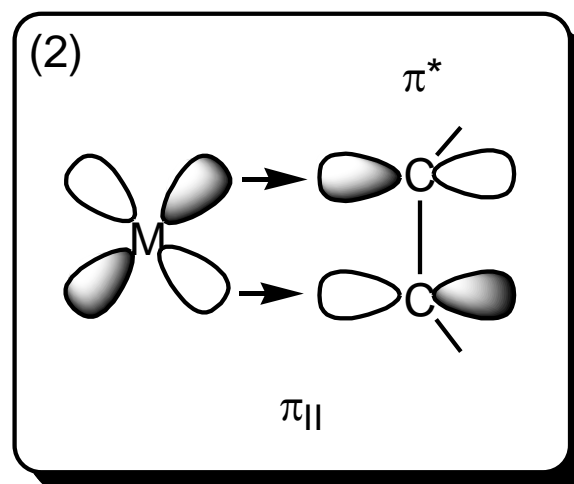
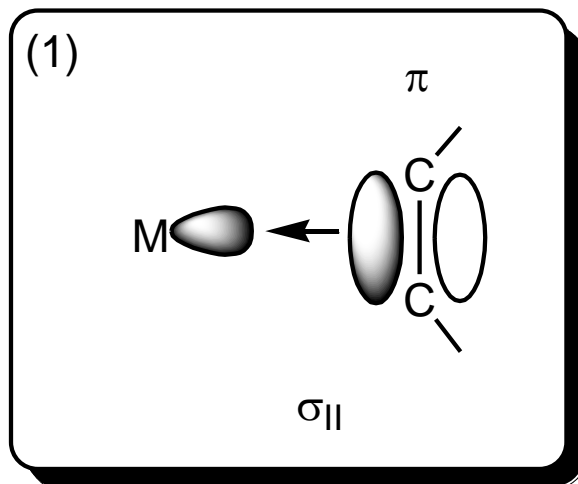
Reduction of a Higher Valent Metal in the Presence of an Alkene:



From Alkyl or Allyl Complexes:



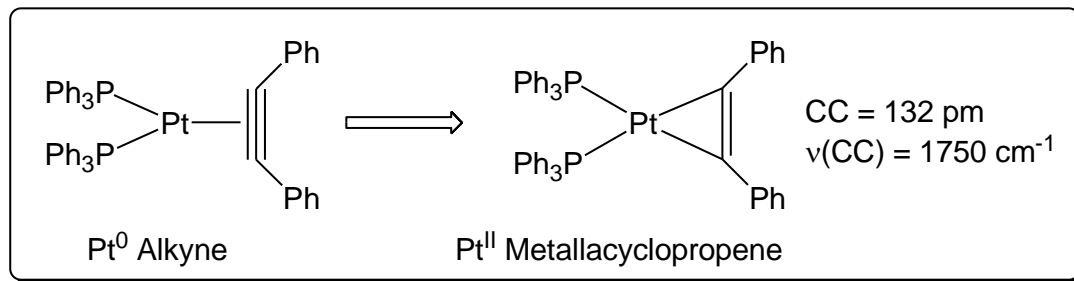
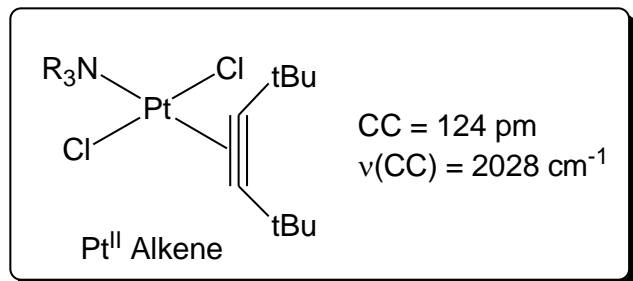
Alkyne complexes: Dewar-Chatt-Duncanson Bonding Model



- Synergic Bonding
- All four possible bonding interactions weaken the CC bond
- Alkynes can be 2 or 4 electron donors, depending on whether the π_{\perp} interaction is significant for a given complex

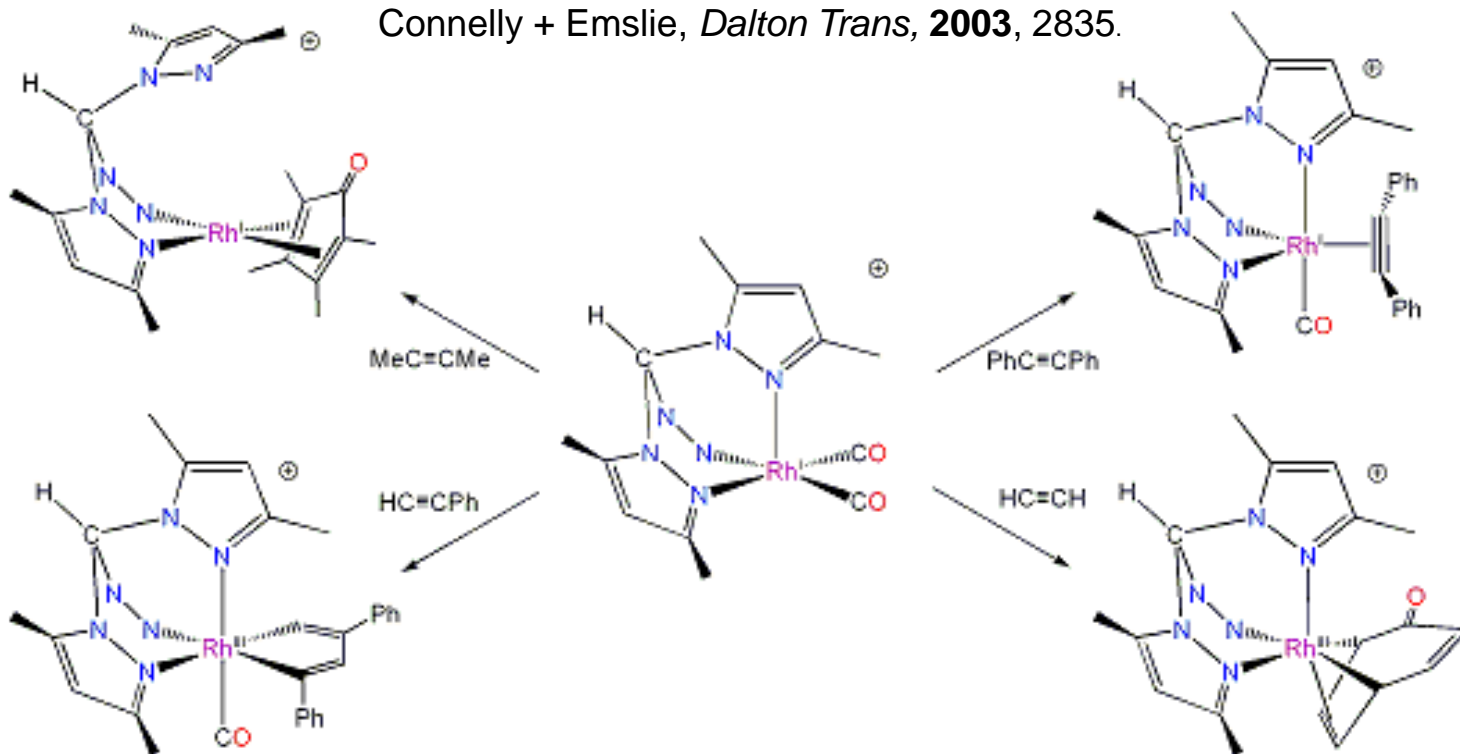
Alkynes Complexes

Alkyne versus Metallacyclopropene Complex

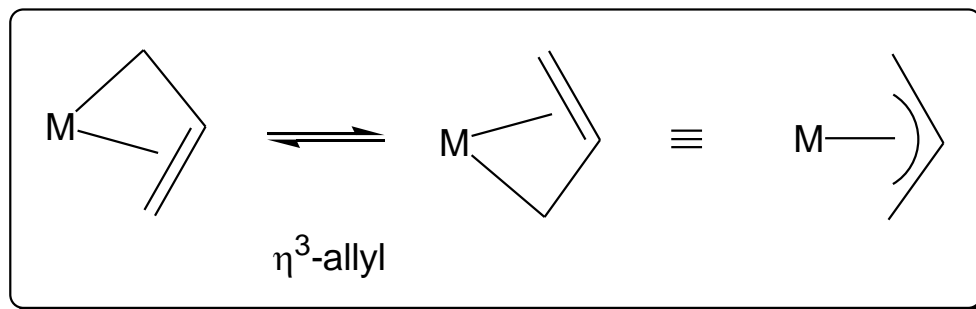
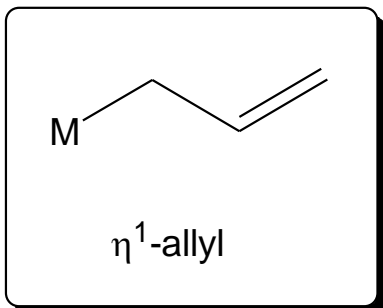


Alkyne Coupling

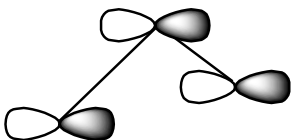
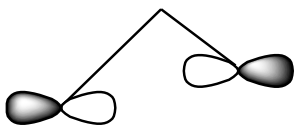
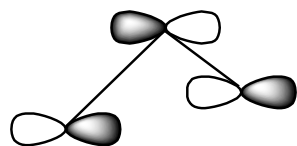
Connelly + Emslie, *Dalton Trans*, **2003**, 2835.



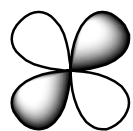
Allyl Complexes



Allyl MOs



Metal Orbitals

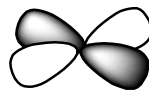


d_{xz}

or

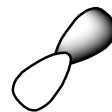


p_x

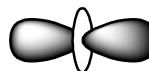


d_{yz}

or



p_y



d_{z^2}

or

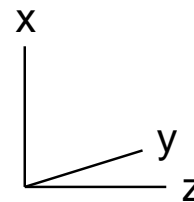


p_z

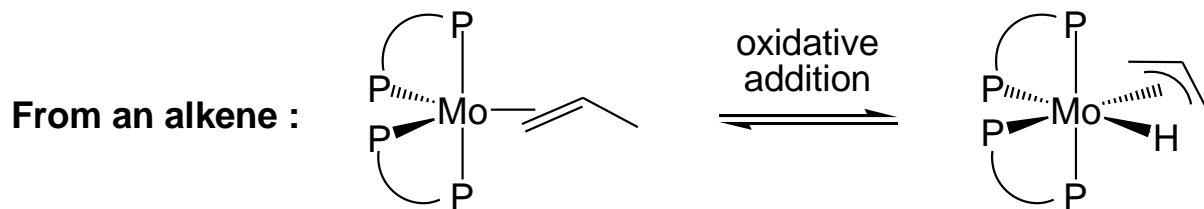
or



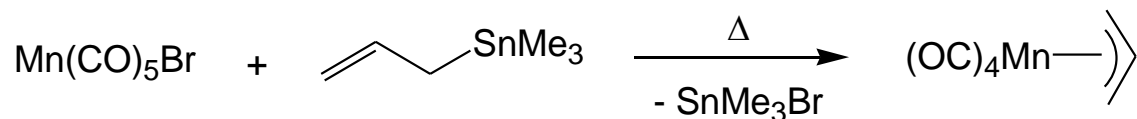
s



Allyl Complexes



Nucleophilic attack of an allyl compound on a metal :



Electrophilic attack of an allyl compound on a metal :

