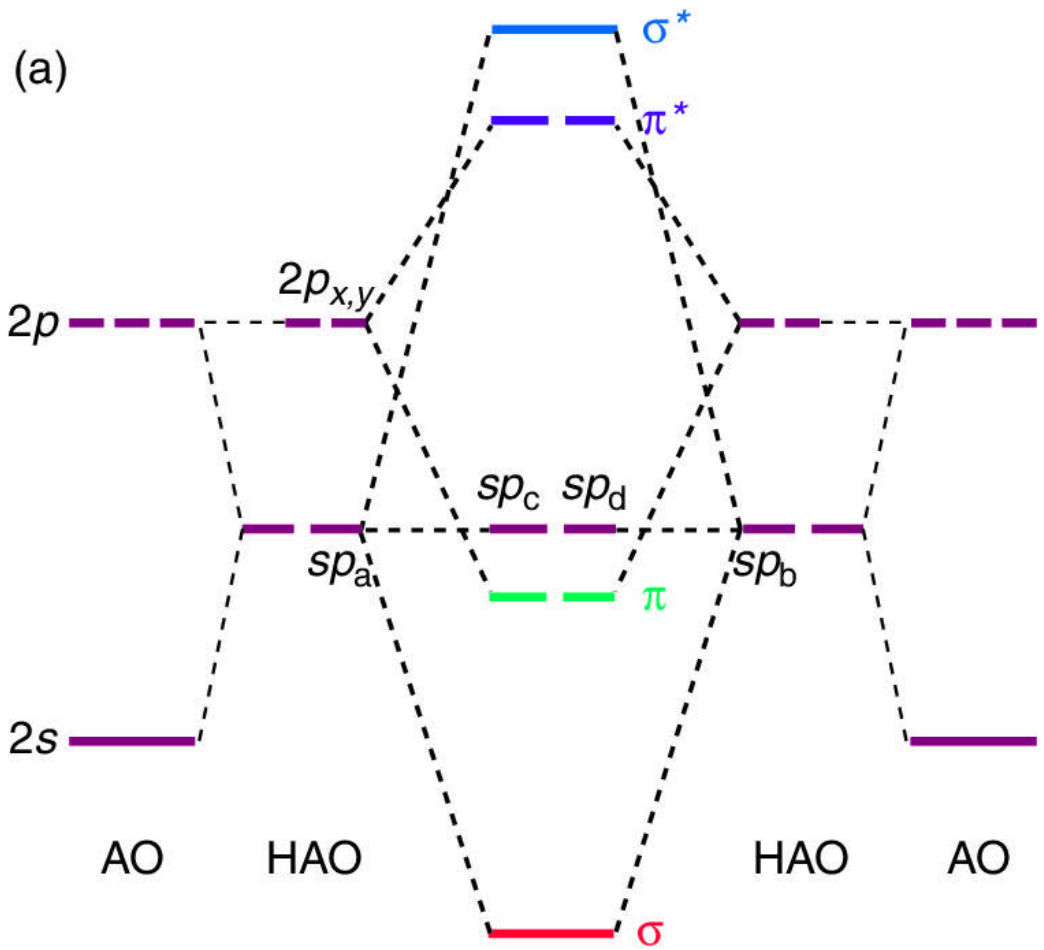
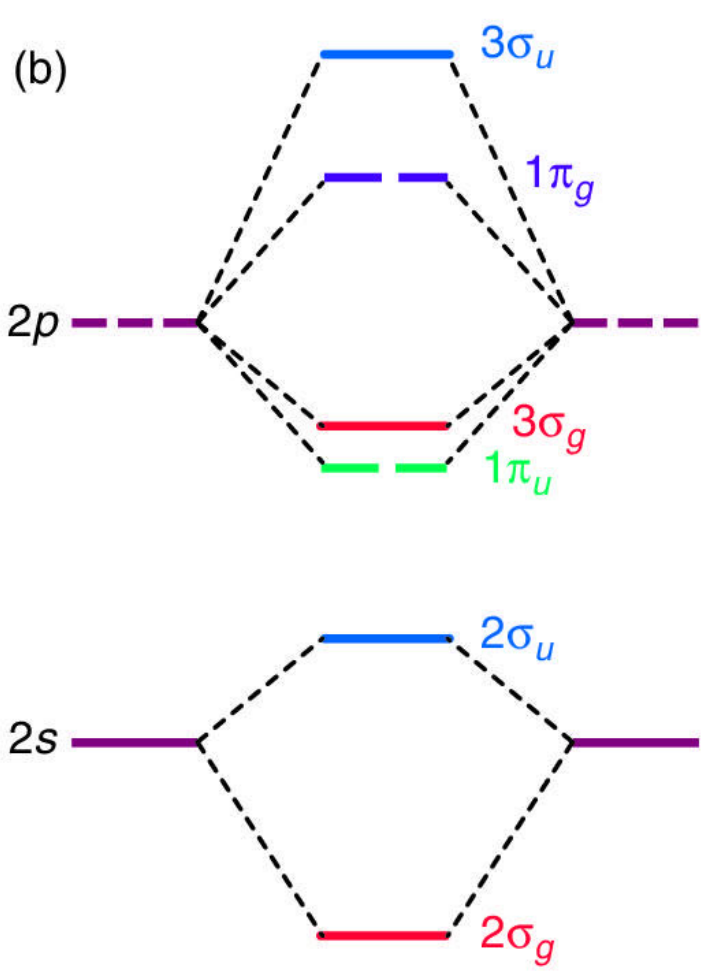
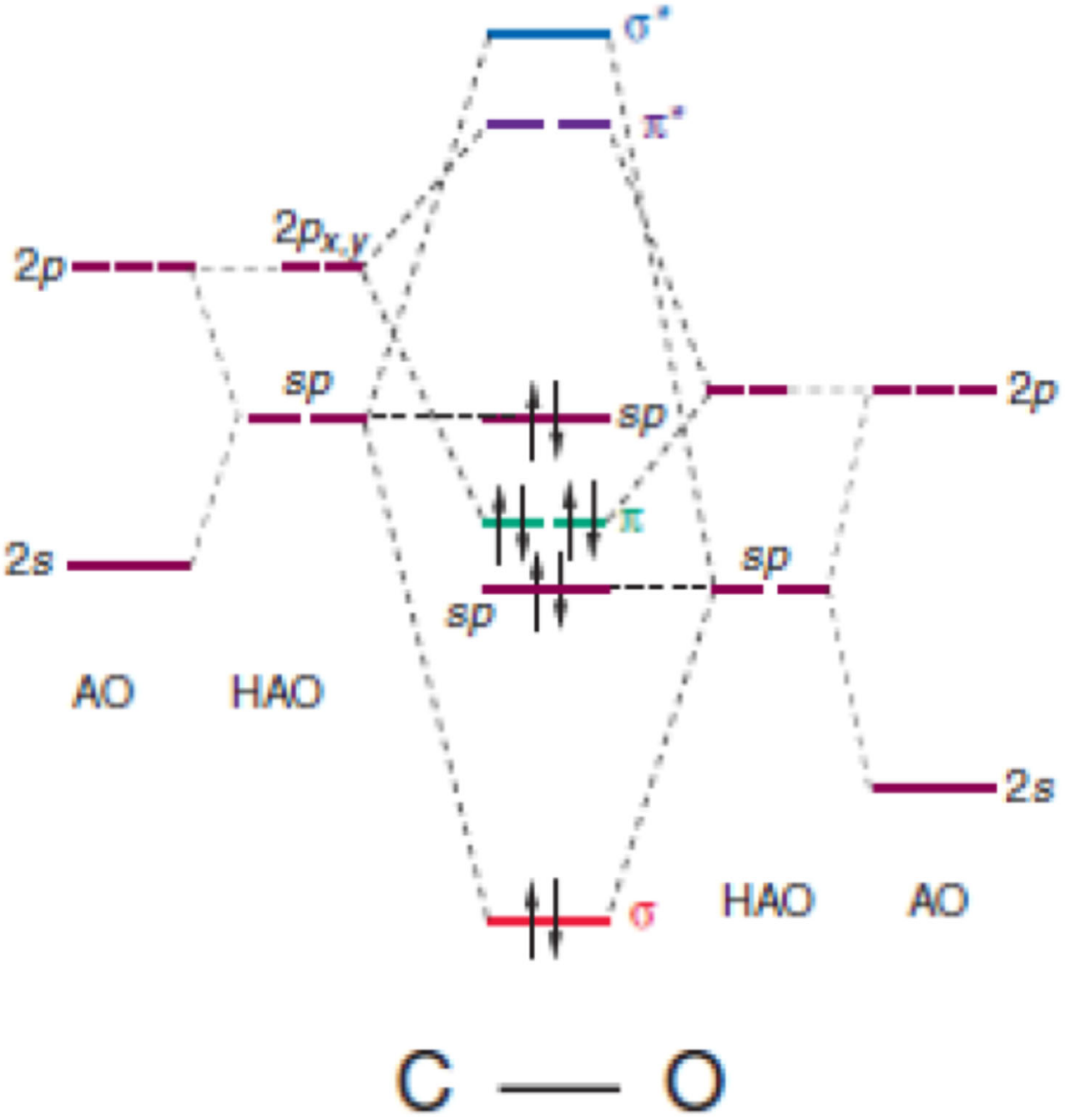
Comparing Hybrid and Full MO for N_2

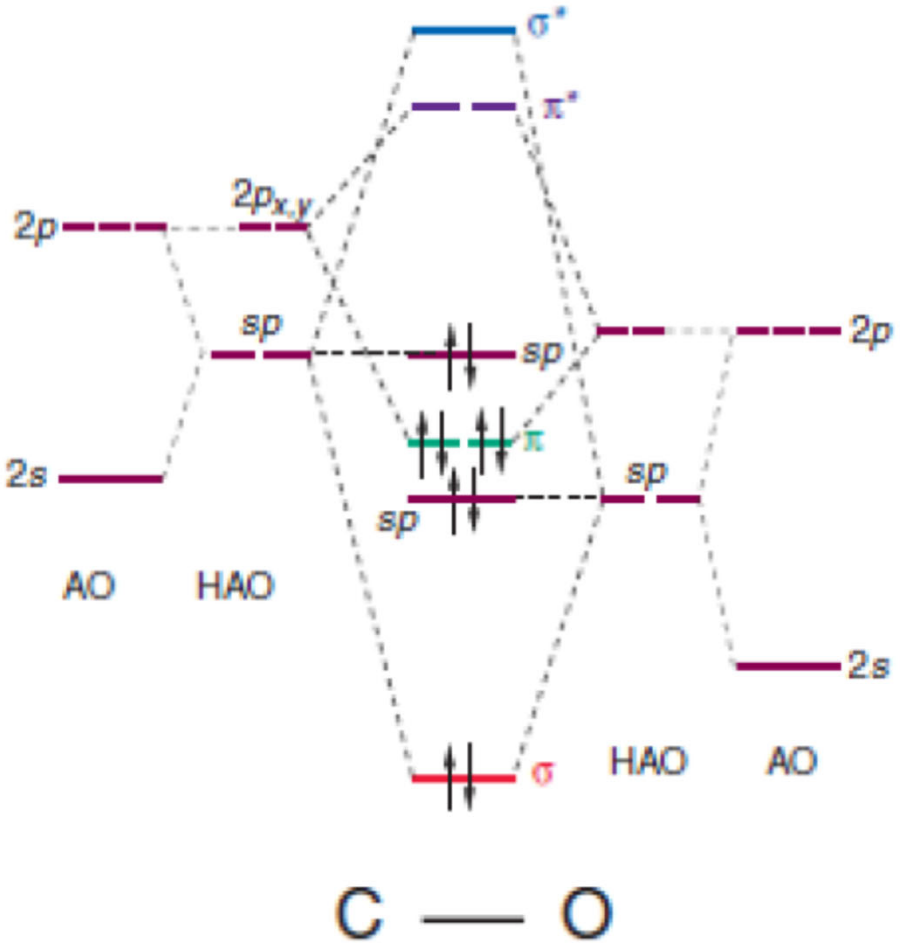


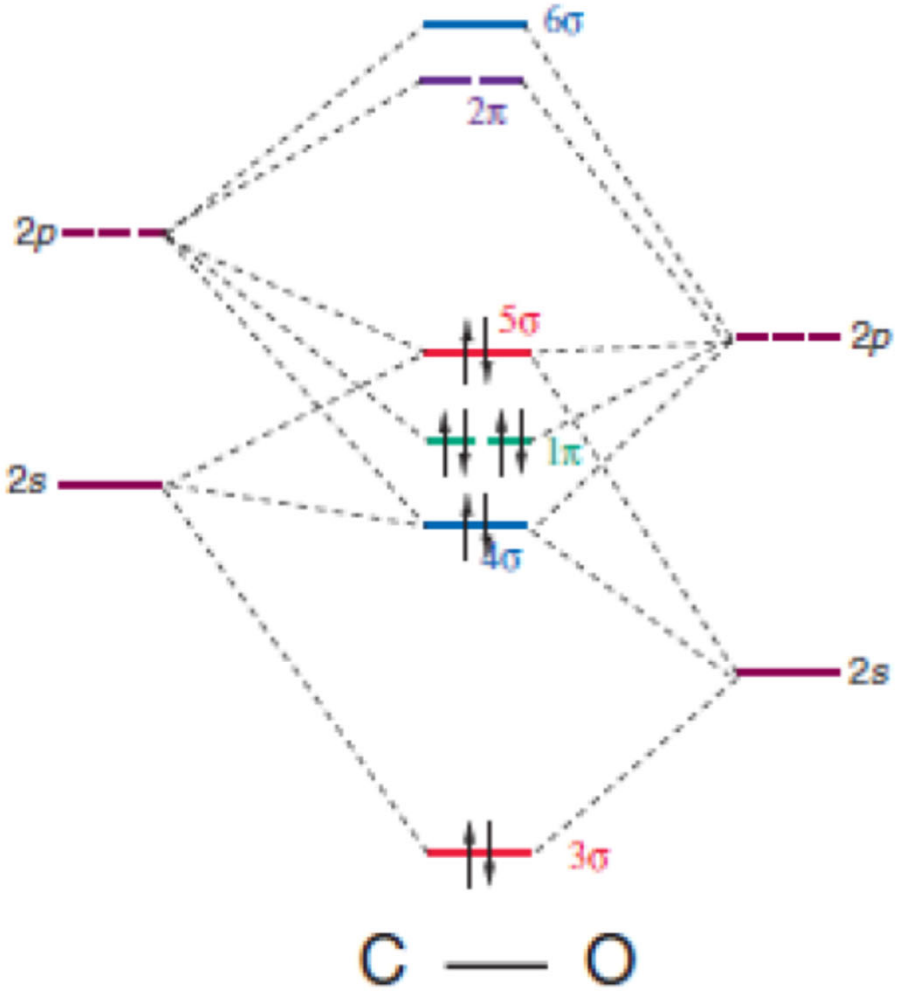


Hybrid MO for CO

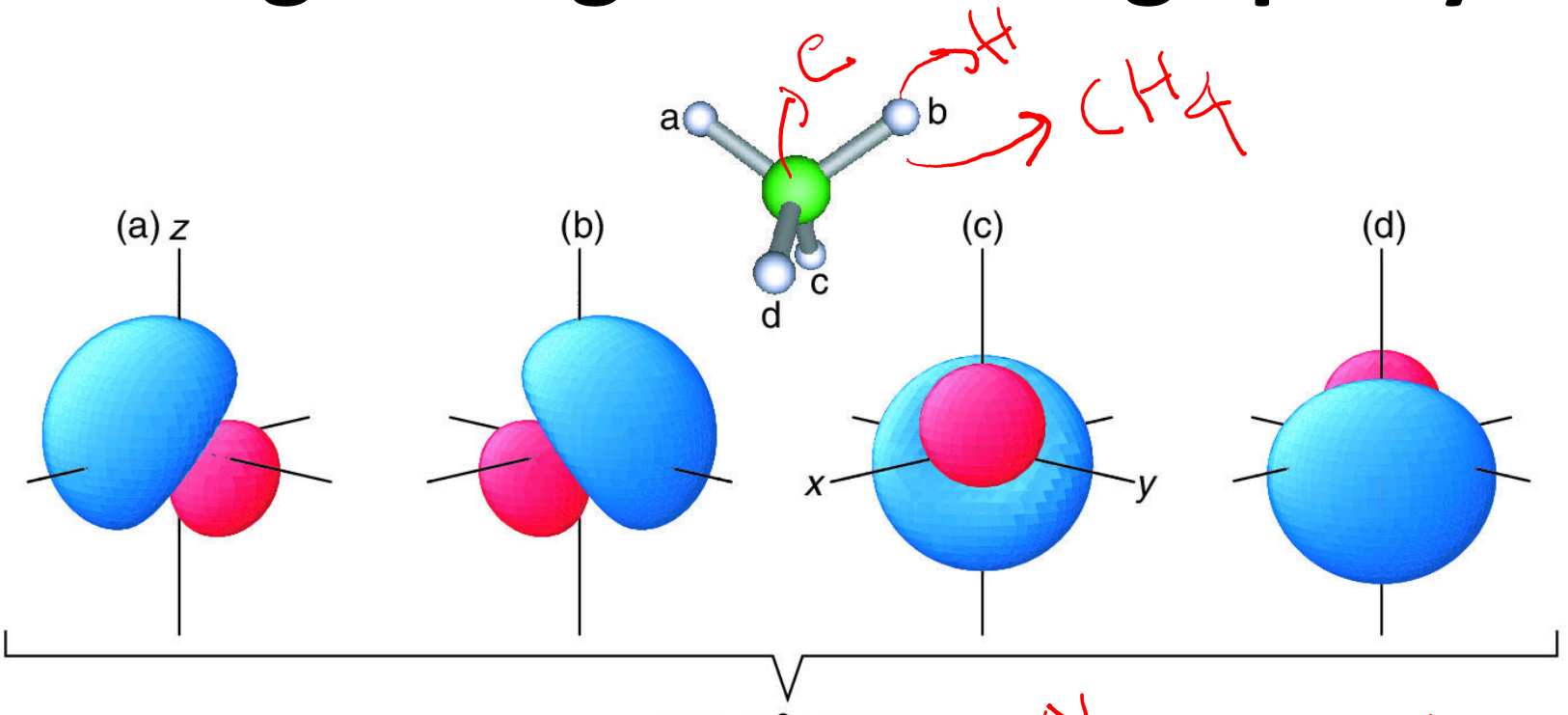


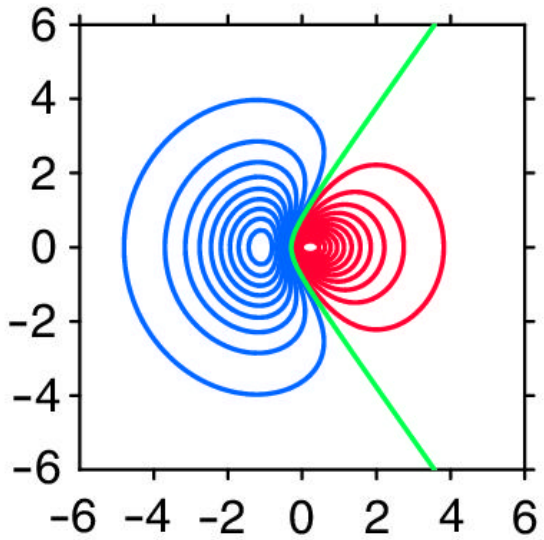
Comparing Hybrid and Full MO for CO

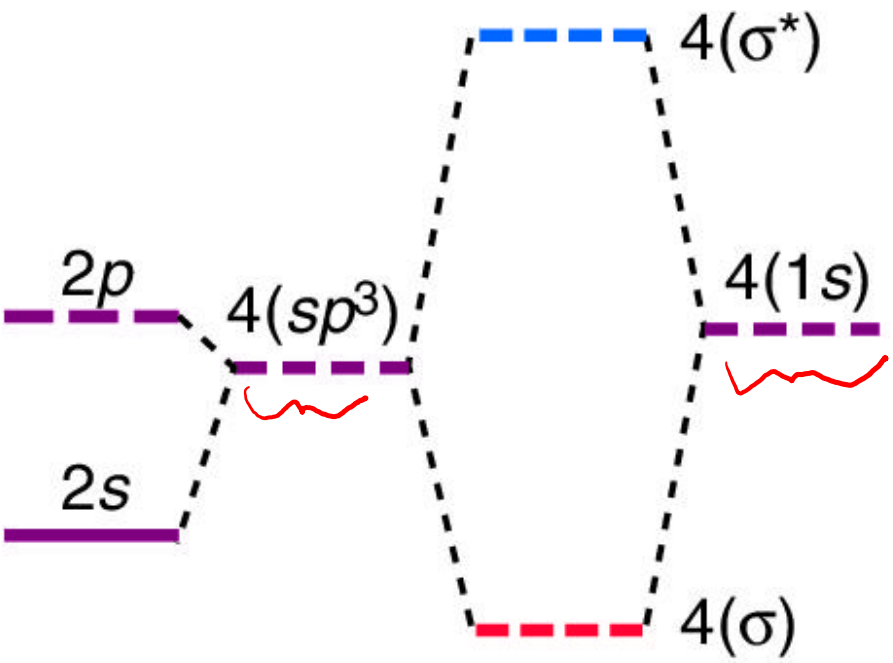


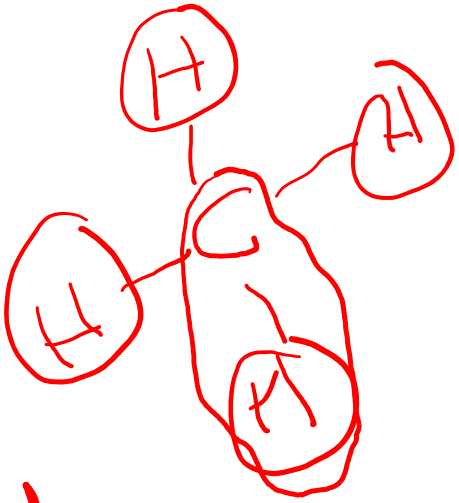


Bonding in Organics: Using sp^3 hybrids





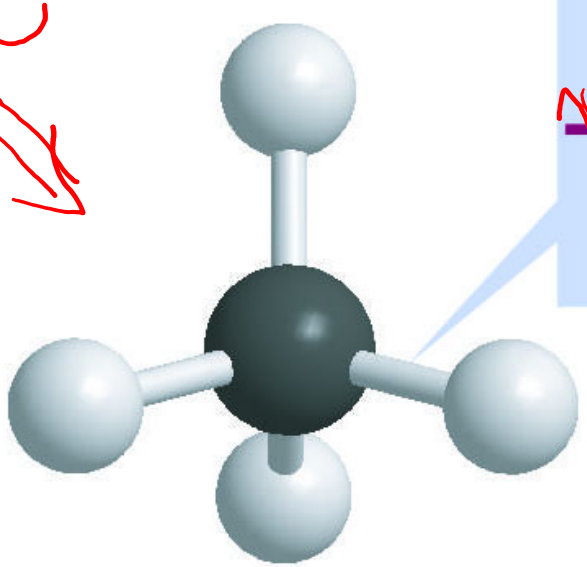


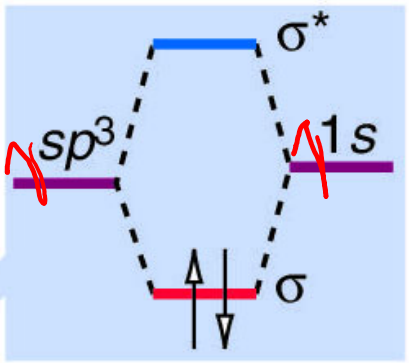


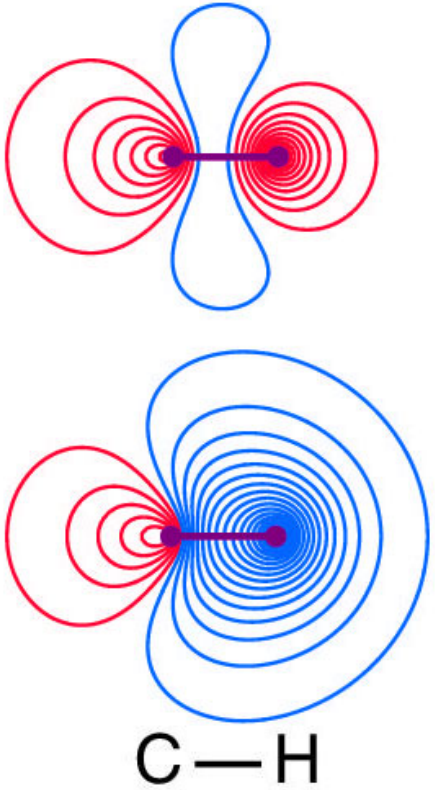
4 such σ bonds

⇒ σ bond ≠ 0

C—H

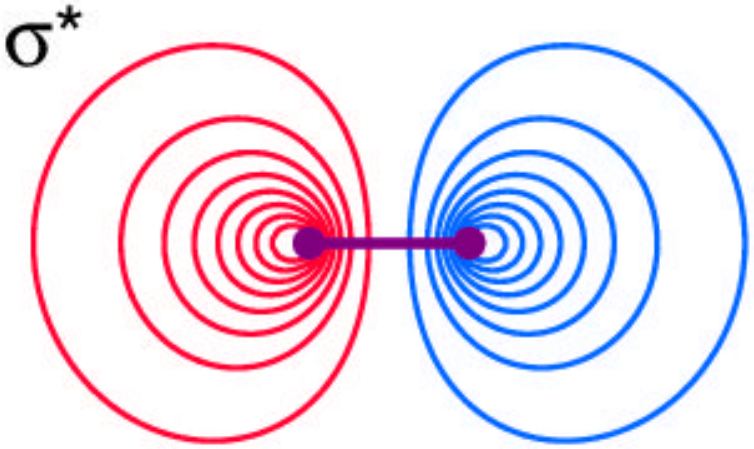


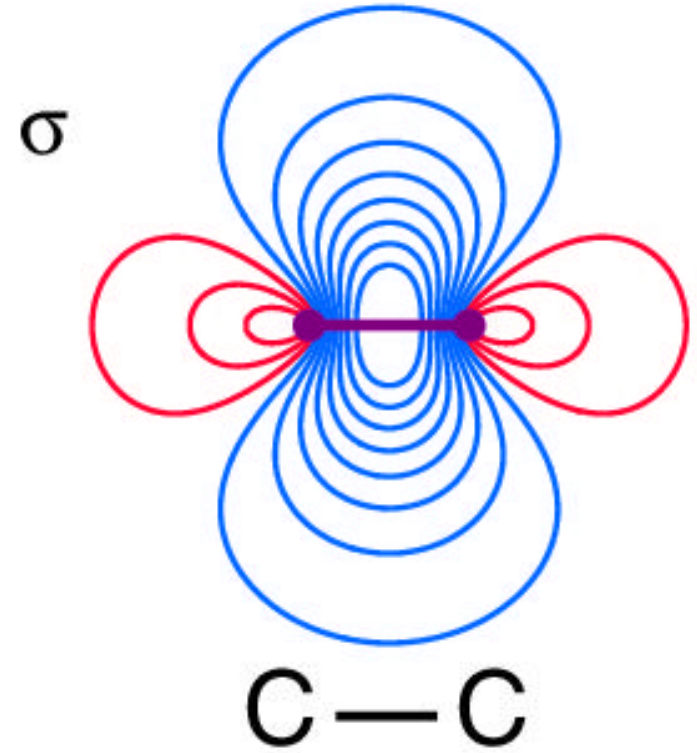


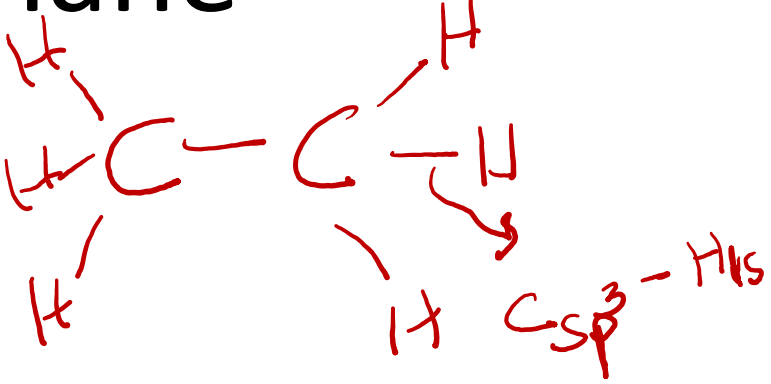


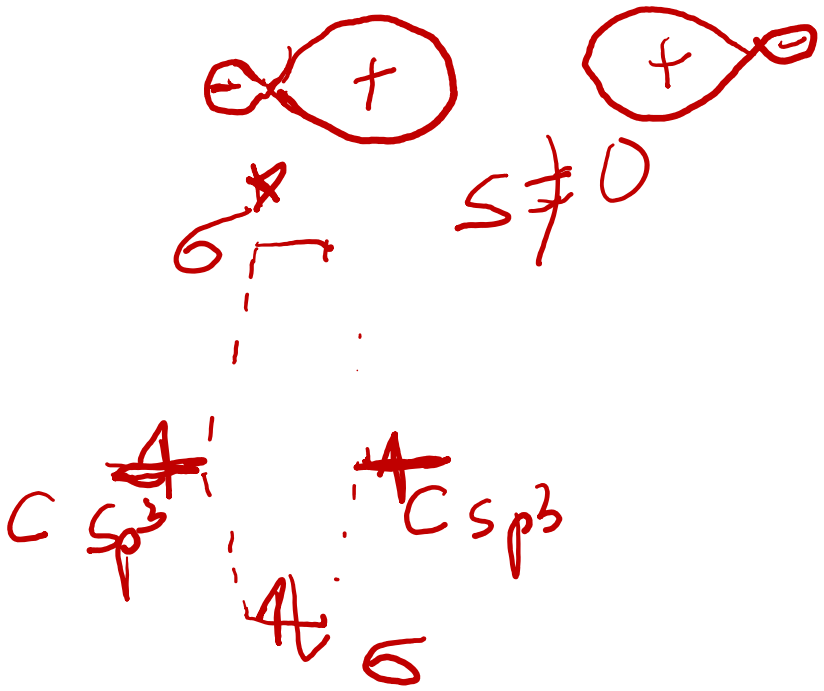
C—H

C-C bonds in Ethane

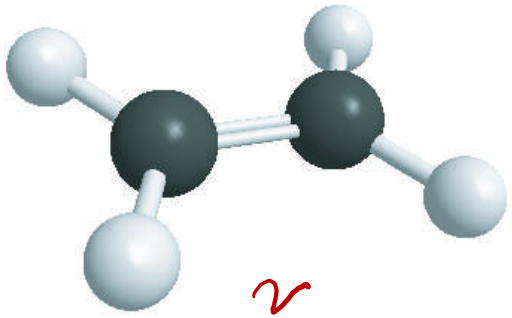


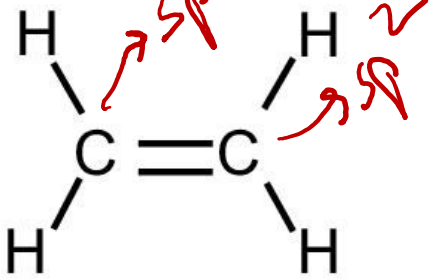


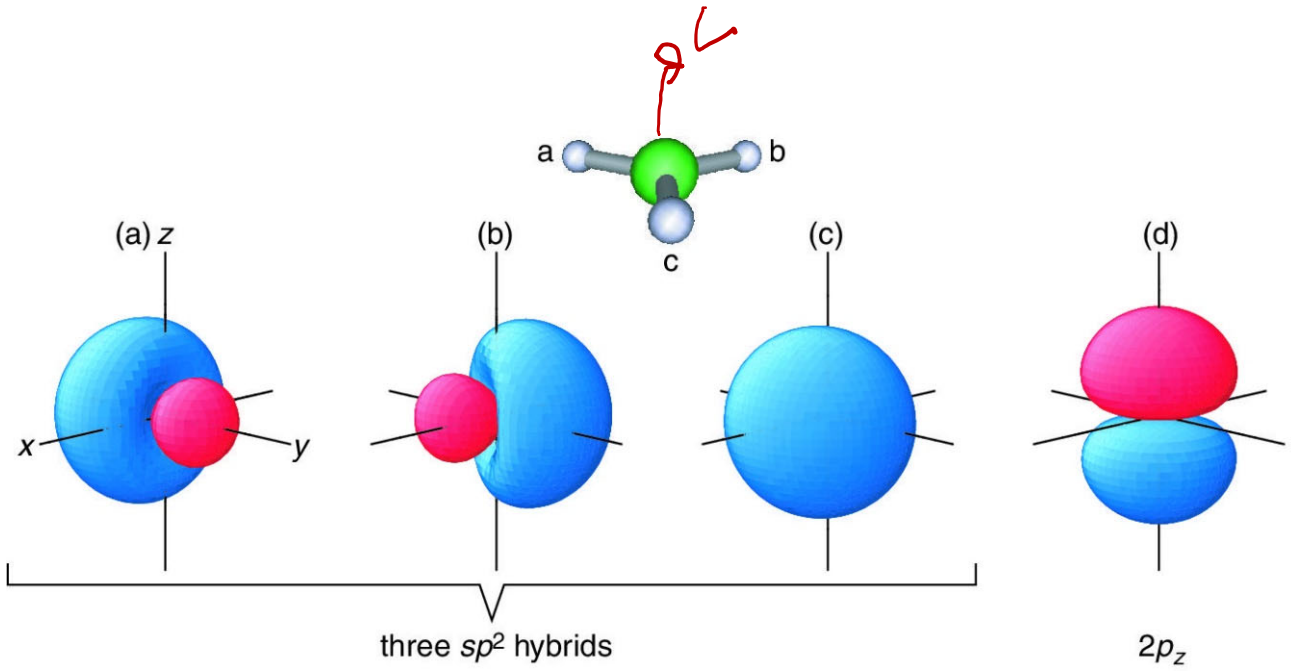


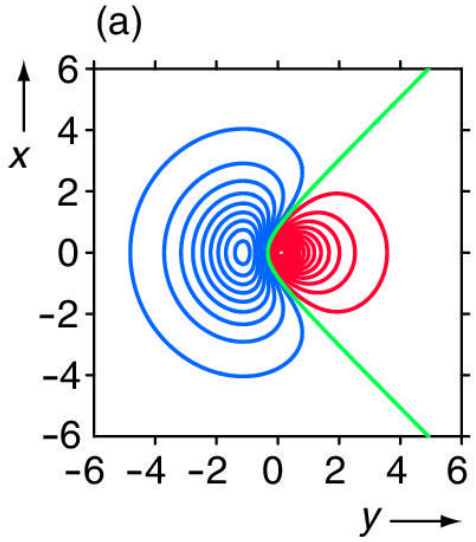


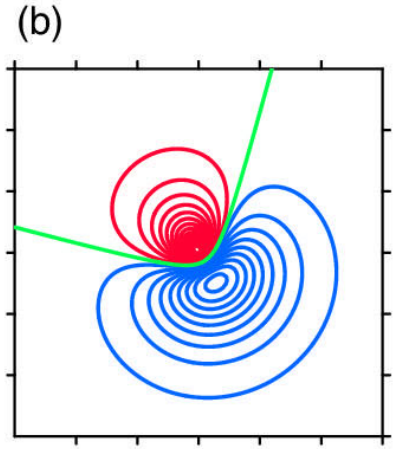
Doubly bonded C: sp^2 Hybrids

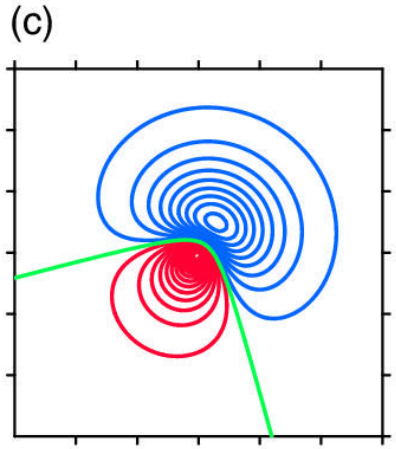


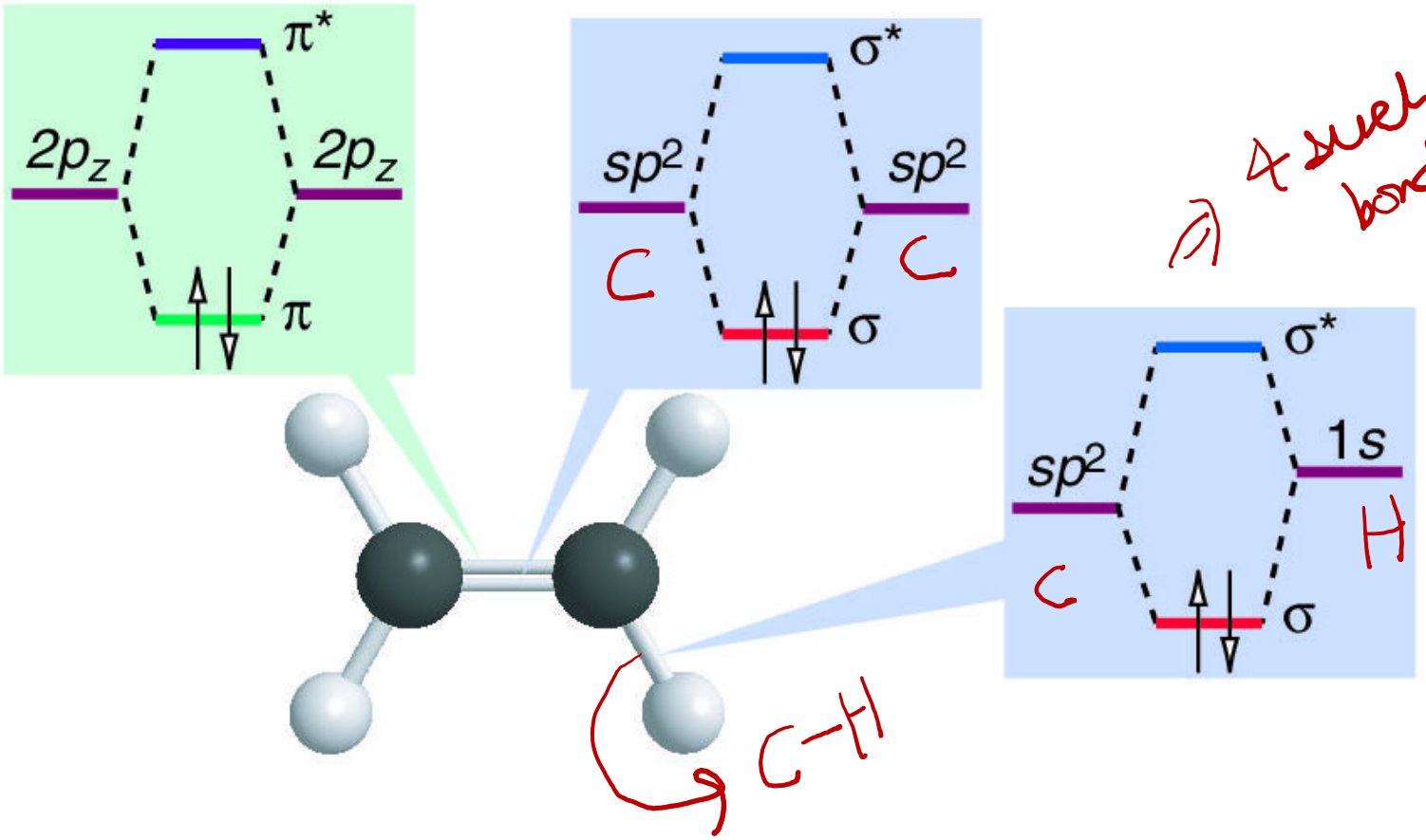


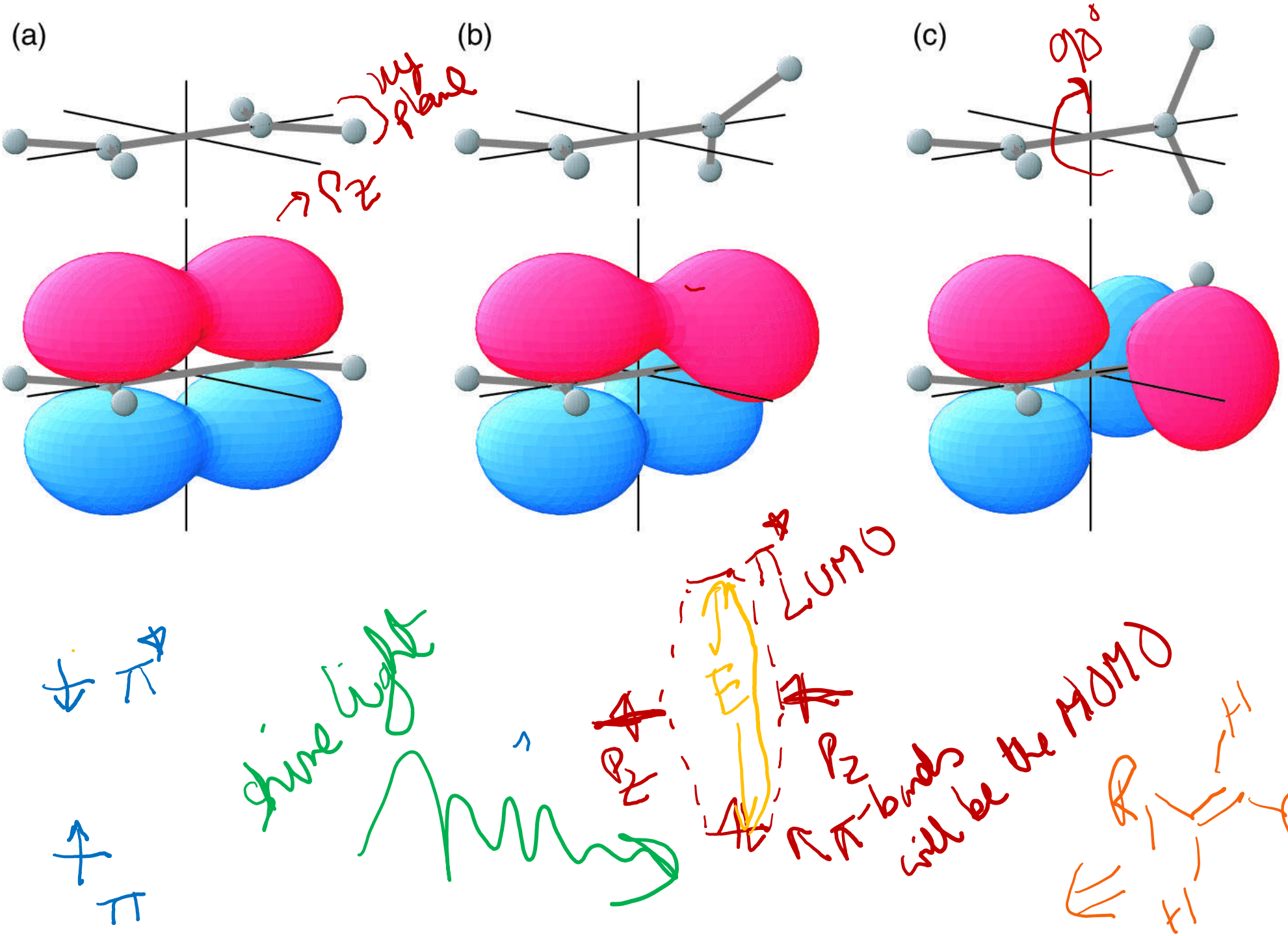




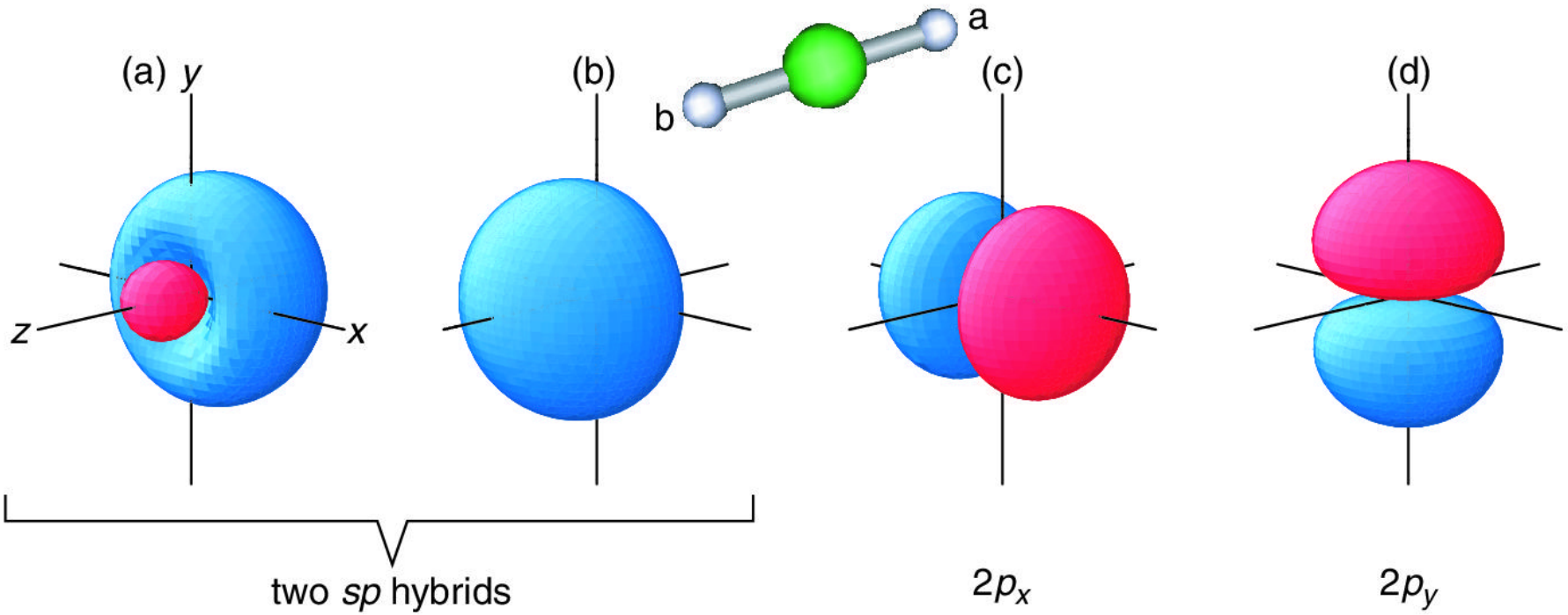


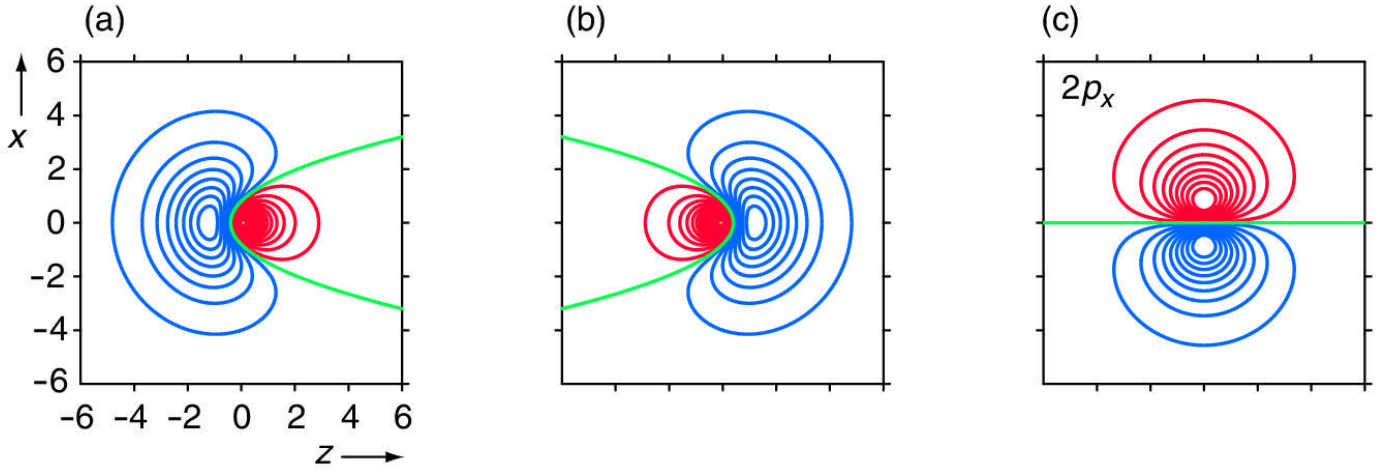


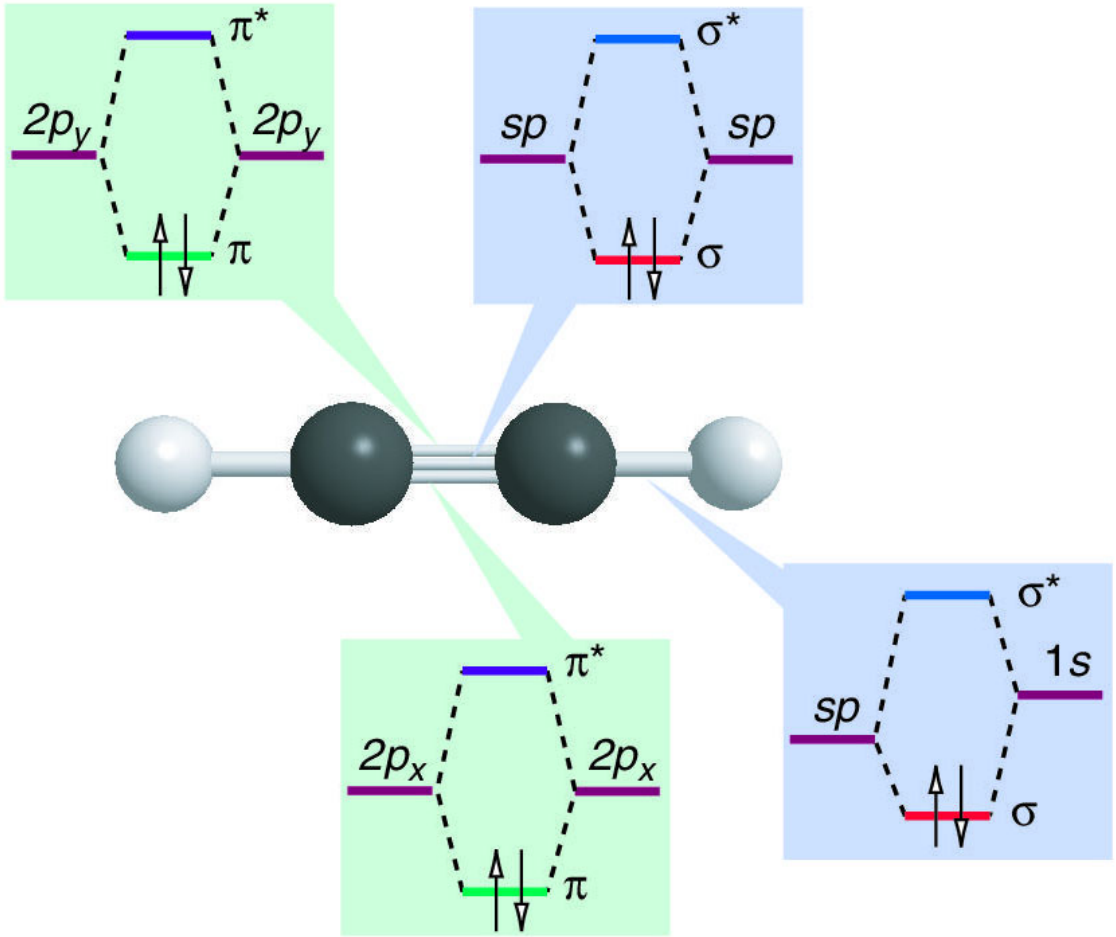

π*
2pz
2pz
π
σ*
sp2
sp2
σ
C
C
4 such bonds
σ*
sp2
1s
σ
C
H
C-H


(a)
(b)
(c)
90°
π*
LUMO
π
HOMO
E
π-bonds will be the HOMO

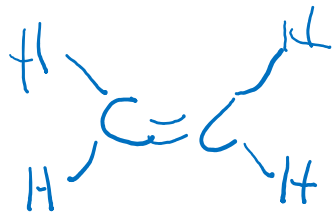
Triply Bonded Carbon: sp Hybrids



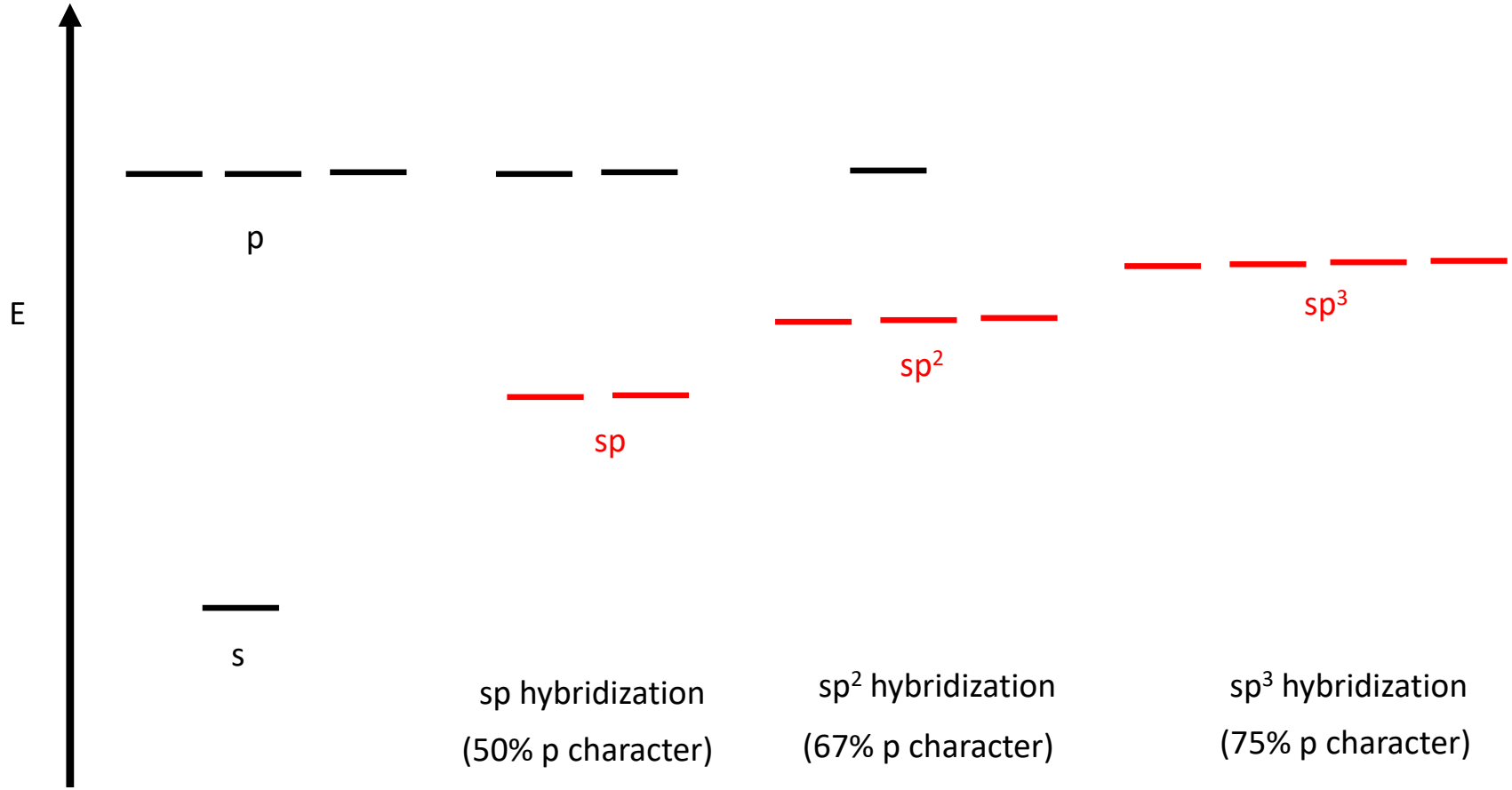



π*
2p_y
2p_y
π
σ*
sp
sp
σ
π*
2p_x
2p_x
π
σ*
1s
sp
σ

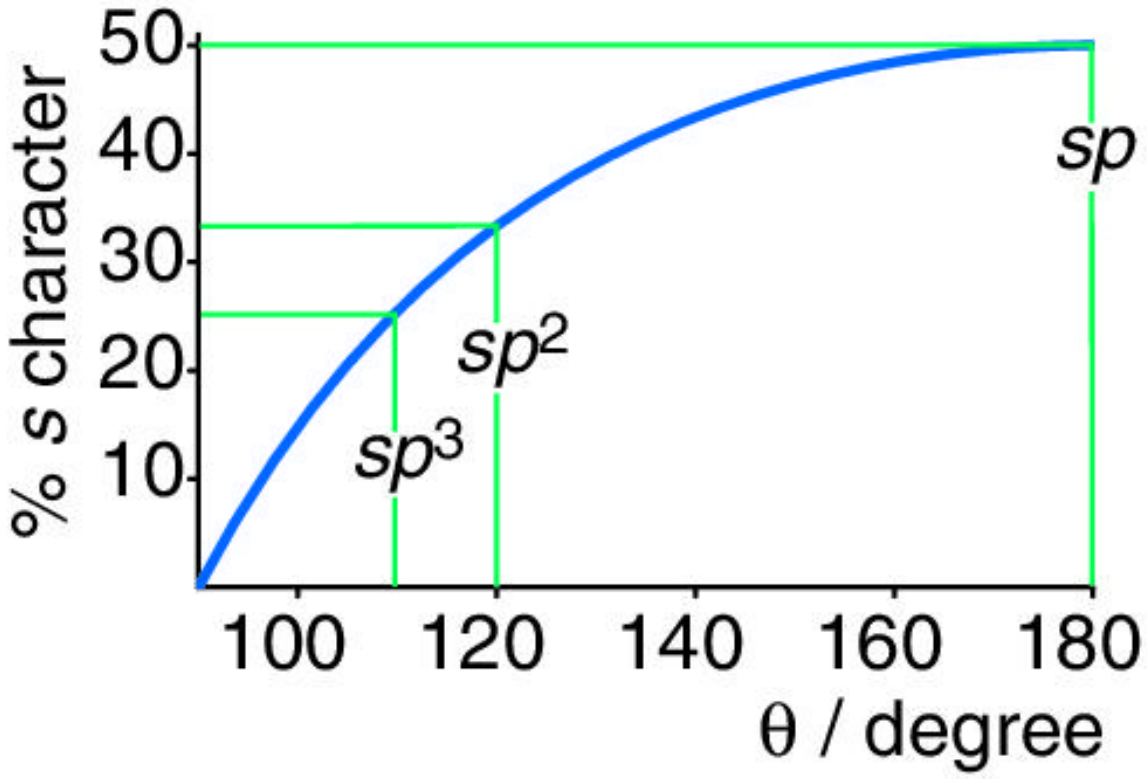
s-character and energy



H–C≡C–H



s-character as function of angle between them



- From sp^3 to sp both the s-character and angle between the hybrids increase
- By selecting the correct s-character we can achieve any angle we like between the hybrids
- When you form HOAs from the 2s and three 2p AOs, you need not make all the resulting HAO's equivalent
- You can add different proportion of s-character in each hybrids: overall proportion of 2s has to be 25%
- They MUST be orthogonal to each other