

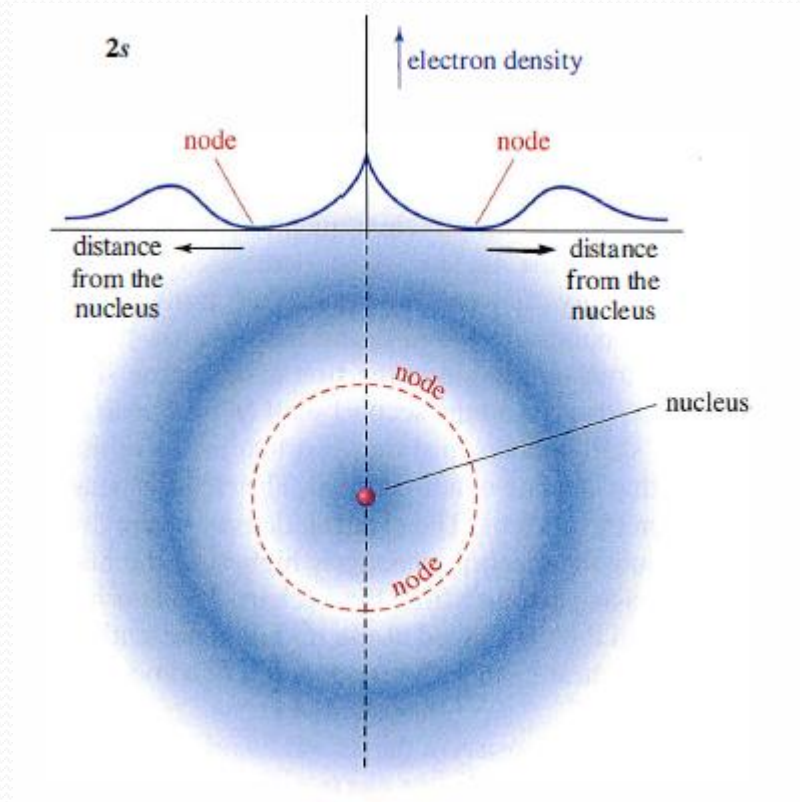
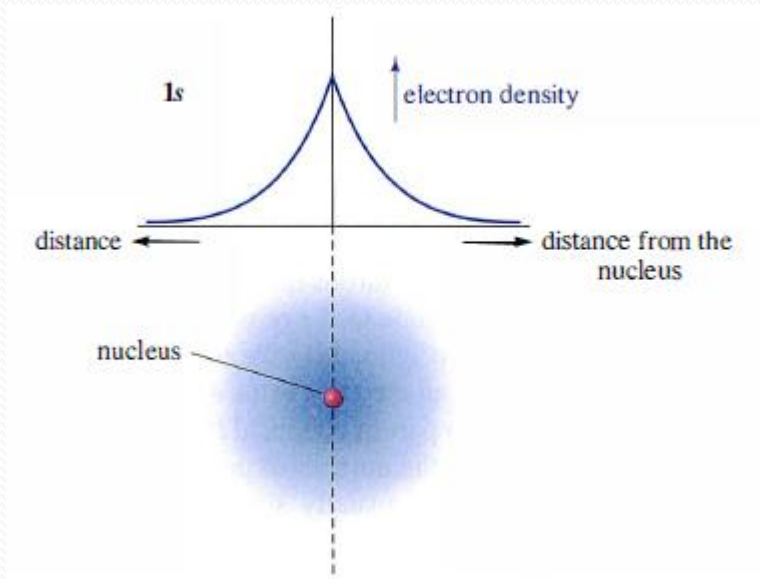
# Atomun Yapısı, Orbitaler Hibridasyon

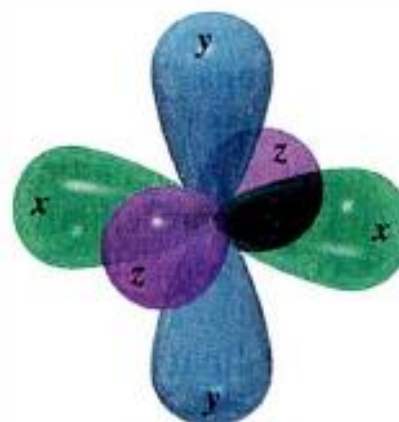
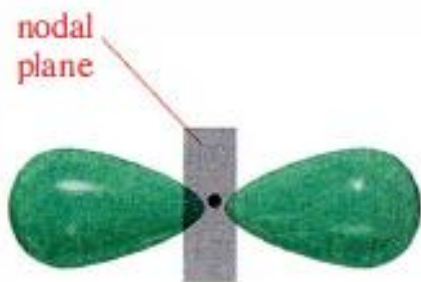
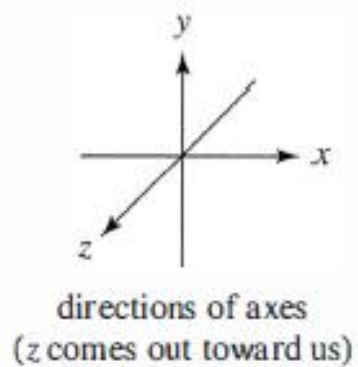
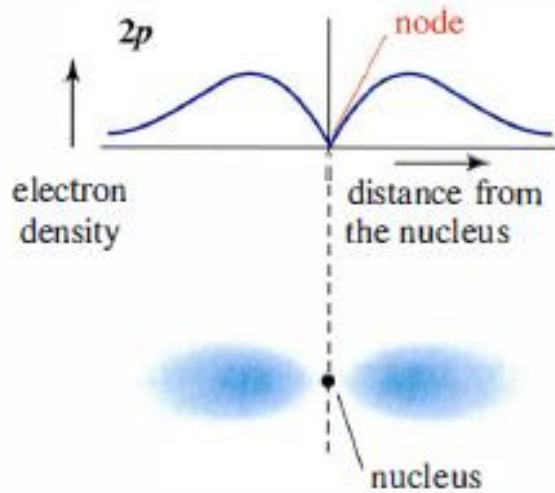
Atomlar, protonlar, nötronlar ve elektronlardan oluşur.

Protonlar pozitif yüklüdür ve atom çekirdeğinde nötronlarla birlikte bulunur.

Elektronlar negatif yüklüdür ve yüksüz bir atomda pozitif yüklü protonlarla eşit sayıda bulunurlar.

Orbital, elektronun bulunma olasılığının fazla olduğu yerdir ve bir orbitalde en çok iki elektron bulunabilir.





Element	Configuration	Valence Electrons
H	$1s^1$	1
He	$1s^2$	2
Li	$1s^2 2s^1$	1
Be	$1s^2 2s^2$	2
B	$1s^2 2s^2 2p_x^1$	3
C	$1s^2 2s^2 2p_x^1 2p_y^1$	4
N	$1s^2 2s^2 2p_x^1 2p_y^1 2p_z^1$	5
O	$1s^2 2s^2 2p_x^2 2p_y^1 2p_z^1$	6
F	$1s^2 2s^2 2p_x^2 2p_y^2 2p_z^1$	7
Ne	$1s^2 2s^2 2p_x^2 2p_y^2 2p_z^2$	8

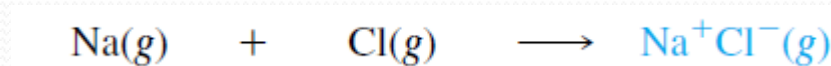
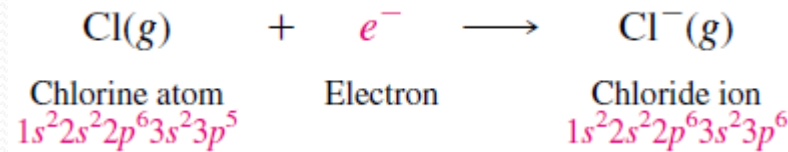
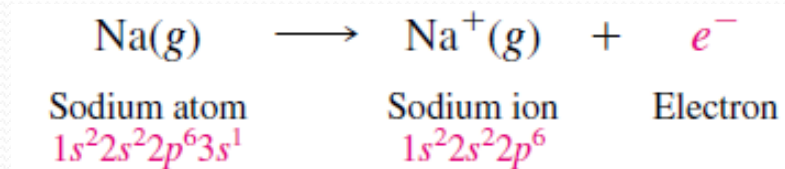
Partial periodic table

IA							noble gases (VIII)
H	IIA	IIIA	IVA	VA	VIA	VIIA	He
Li	Be	B	C	N	O	F	Ne
Na	Mg	Al	Si	P	S	Cl	Ar

# Kimyasal Bağlar

## 1) Elektrovalan (İyonik) bağlar

İyonik bağlar bir ya da daha fazla elektronun bir atomdan diğerine aktarılmasıyla oluşur.

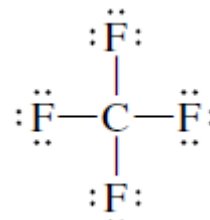
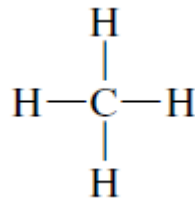
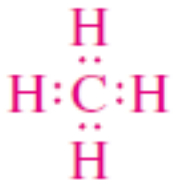


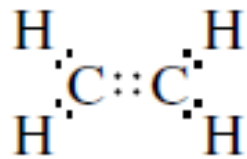
## 2) Kovalent bağlar

Kovalent bağlar elektron çiftlerinin ortaklaşa kullanılmasıyla oluşur.

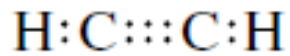
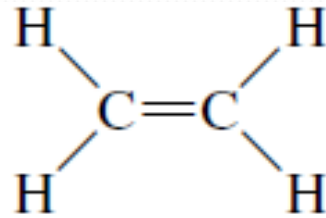


Lewis yapılarını yazarken molekül ya da iyonu oluşturan atomların sadece değerlik elektronlarını (en dış kabuk elektronları) göstererek bir araya getiririz.

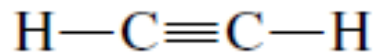




or

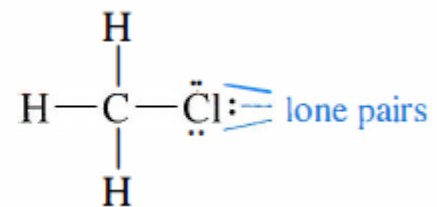
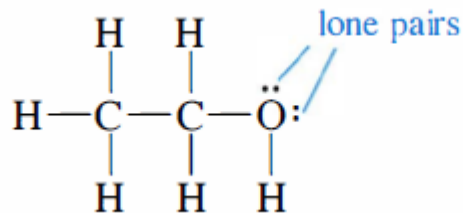
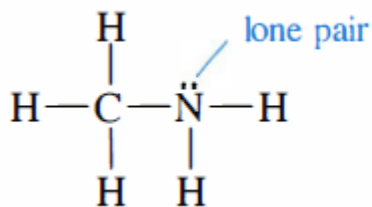


or



Valans elektronları iki atom arasında paylaşılmıyor ise bu elektronlara bağ yapmayan elektronlar denir.

Bir orbitaldeki iki adet bağ yapmayan elektron sıklıkla serbest elektron çifti olarak adlandırılır.



# Atomların Elektronegatifliđi

H 2.2						
Li 1.0	Be 1.6	B 1.8	C 2.5	N 3.0	O 3.4	F 4.0
Na 0.9	Mg 1.3	Al 1.6	Si 1.9	P 2.2	S 2.6	Cl 3.2
K 0.8						Br 3.0
						I 2.7

Elektronegatiflik bir atomun elektronları çekebilme becerisidir.

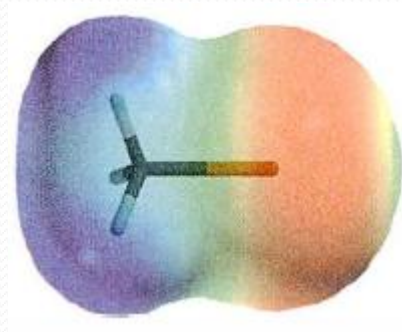
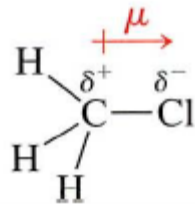
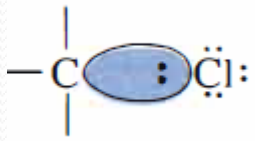
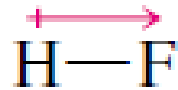
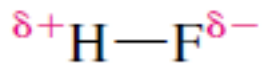
Periyodik tabloda soldan sađa ve ařađıdan yukarıya gidildikçe elektronegatiflik artmaktadır.



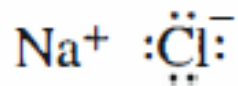
# Nonpolar kovalent bağ;



# Polar kovalent bağ;



# İyonik bağ;



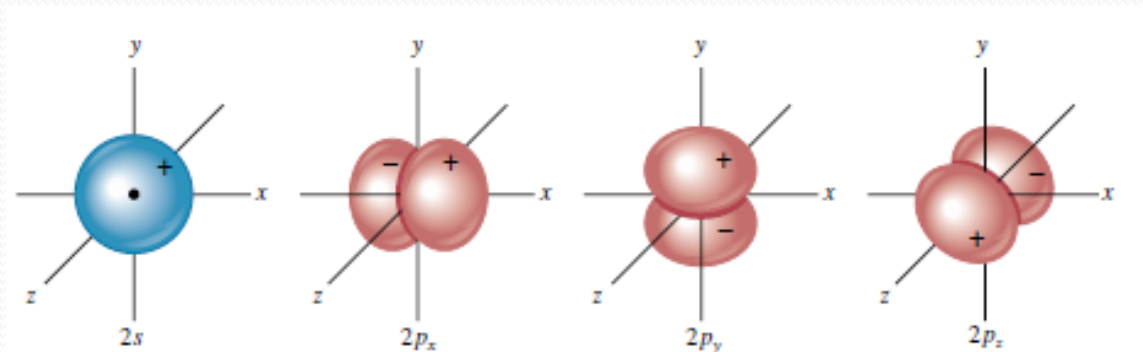
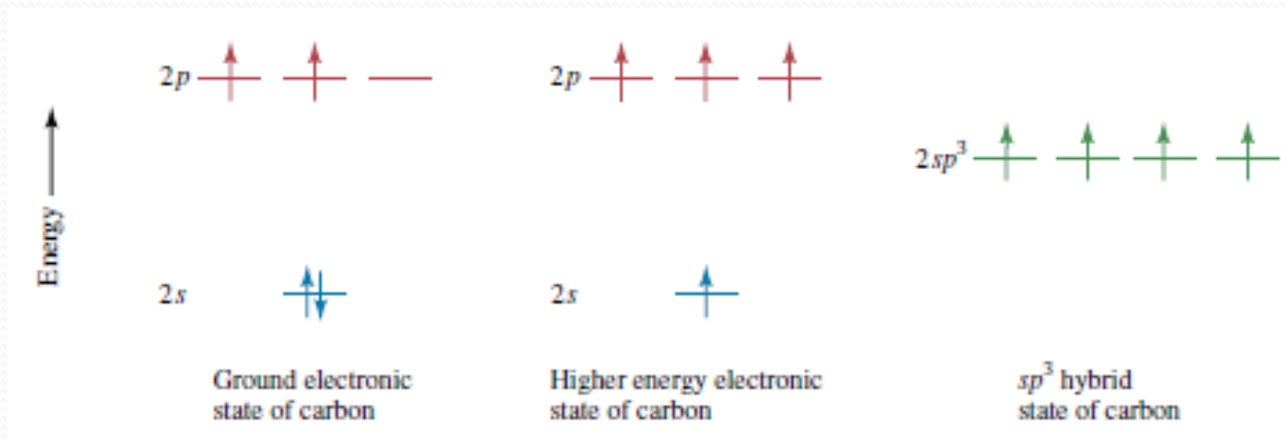
## Formal Yük

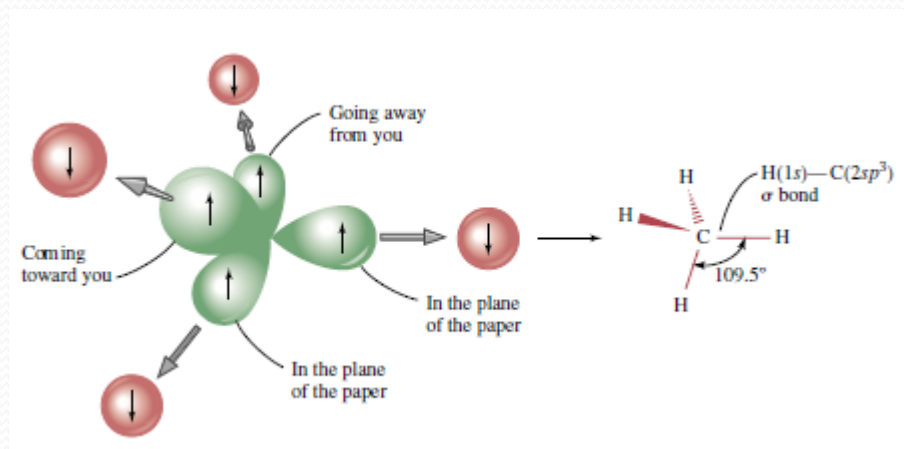
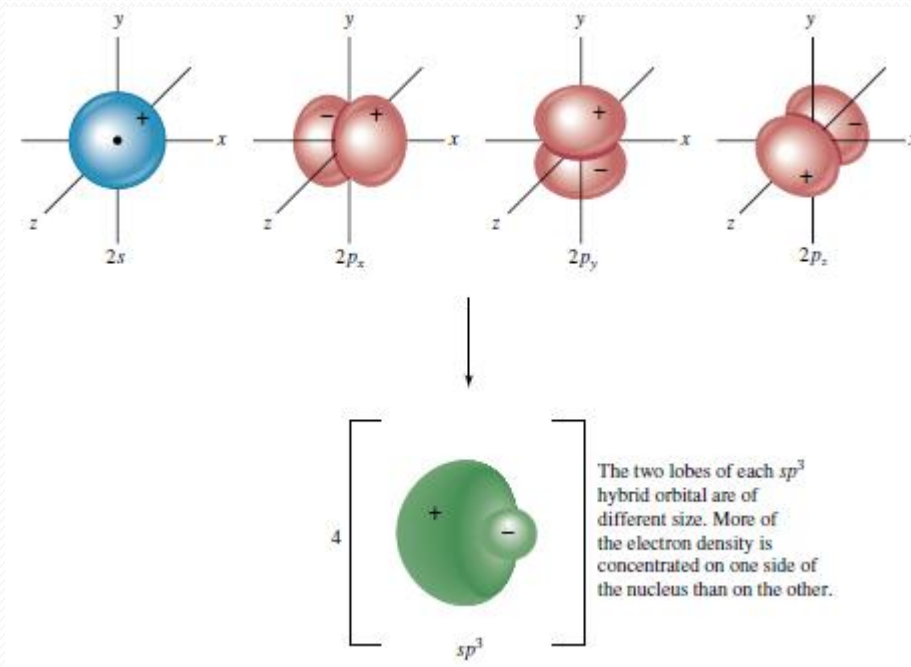
Bir molekülde molekülü oluşturan bir ya da daha fazla atom pozitif ya da negatif yüklerden birisiyle yüklü olabilir.

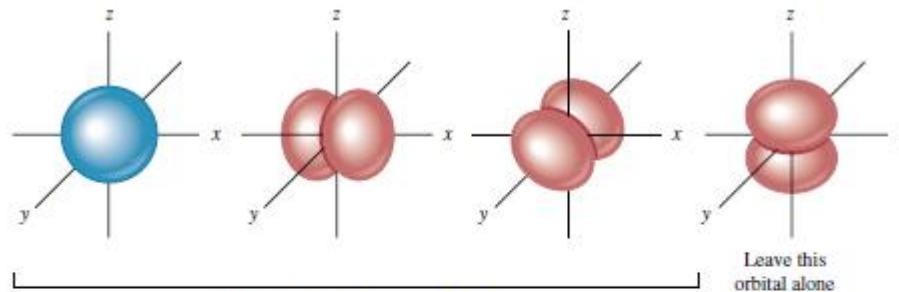
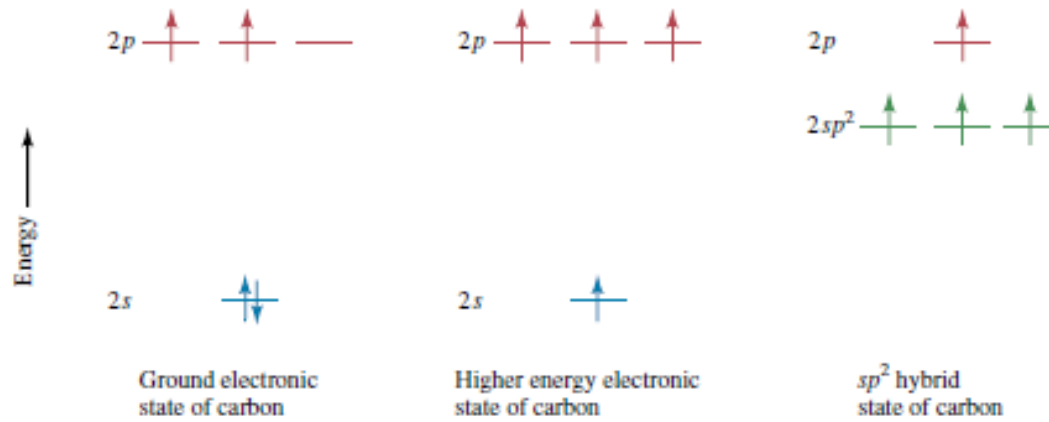
Moleküldeki yükün hangi atomda olduğunun bilinmesi molekülün kimyasal reaksiyonlarına etki ettiğinden dolayı oldukça önemlidir.

Formal yük= Grup numarası- Bağ yapmayan elektronlar- Bağ sayısı

# Orbital Kavramına Göre Kimyasal Bağlar

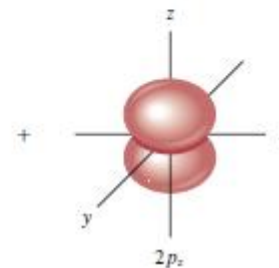
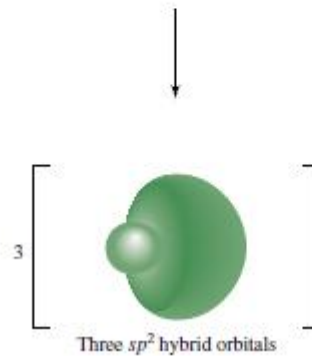


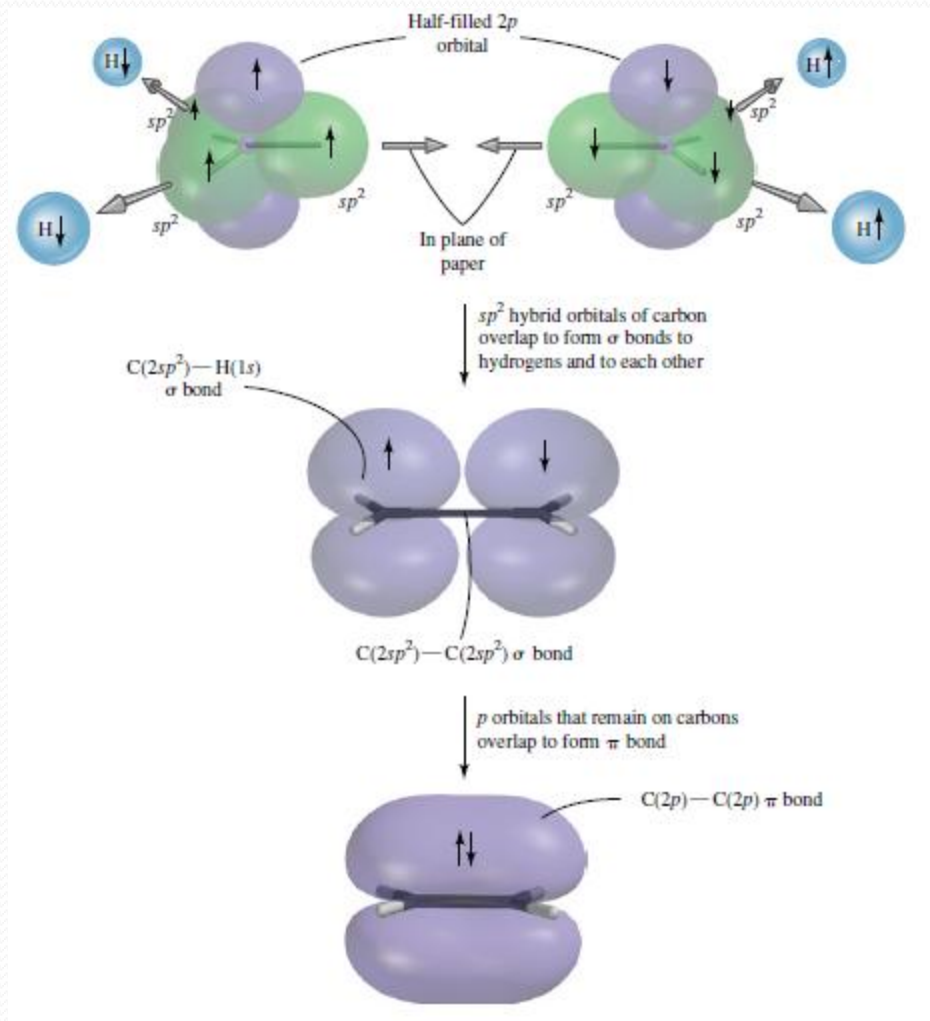


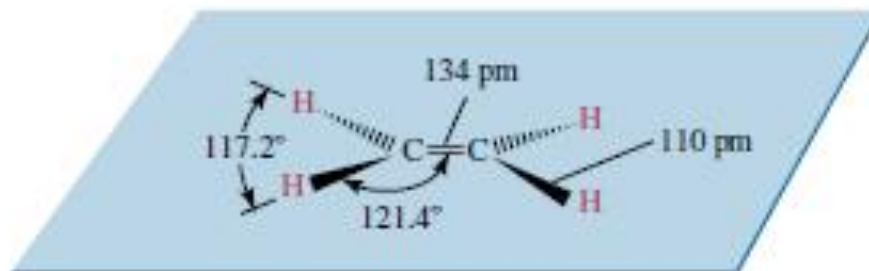


Combine one 2s and two 2p orbitals

Leave this  
orbital alone



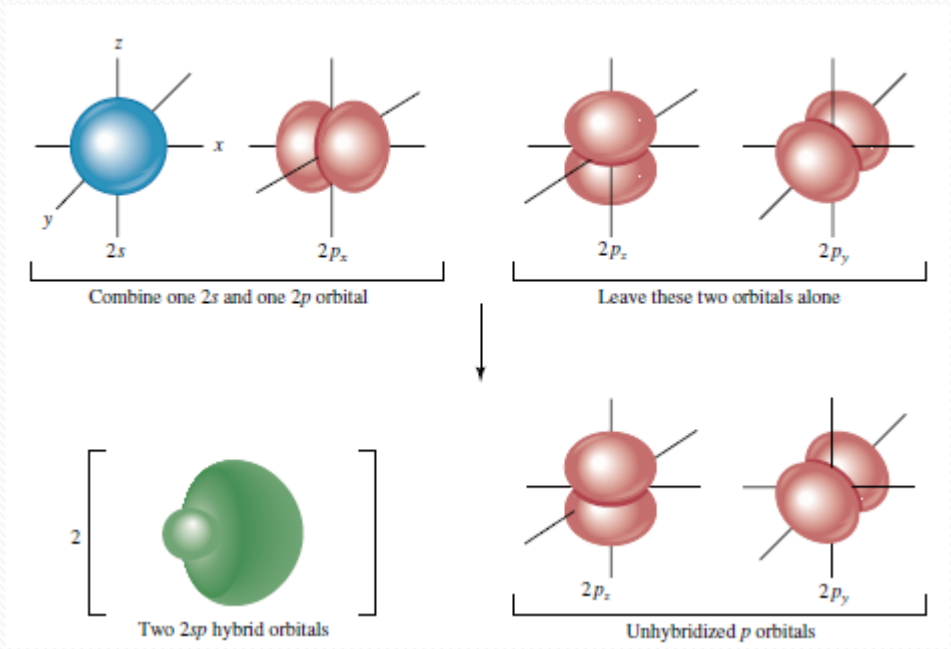
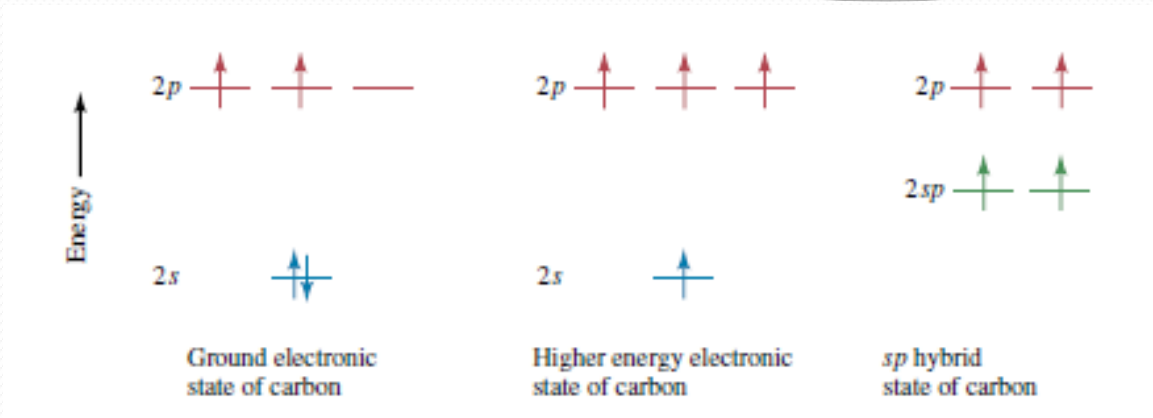




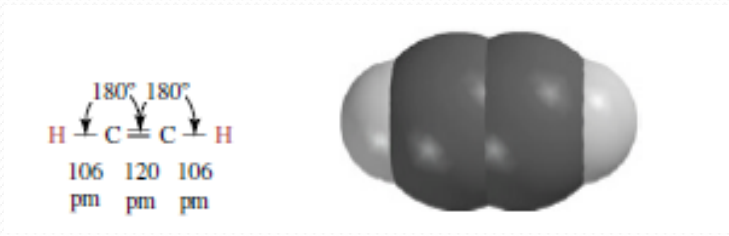
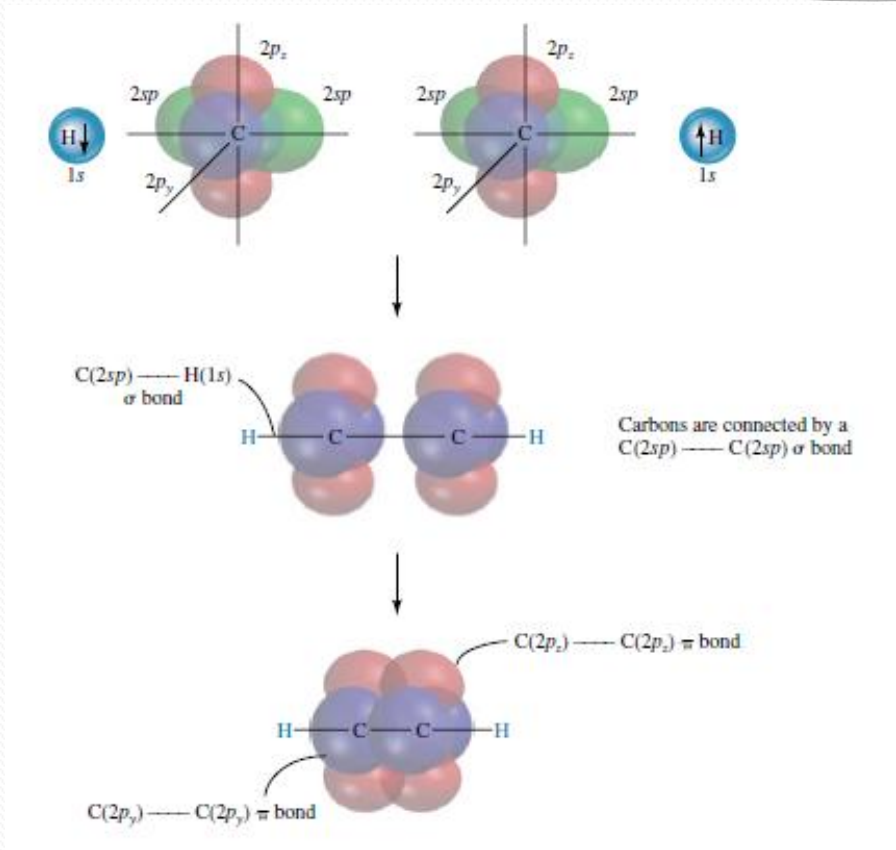
(a)



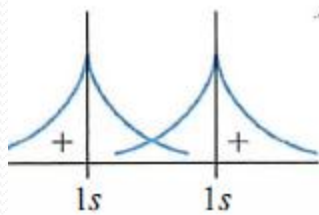
(b)



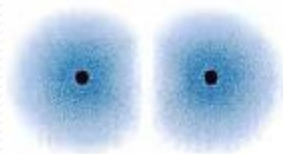
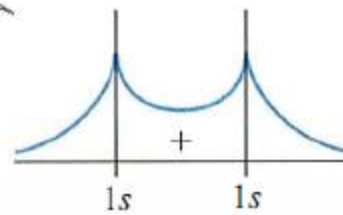




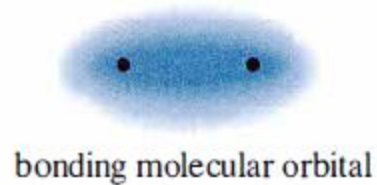
Constructive Interaction: The two 1s orbitals are in phase and have the same sign.



add

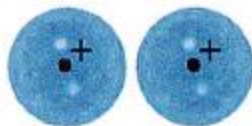


→



bonding molecular orbital

represented by:

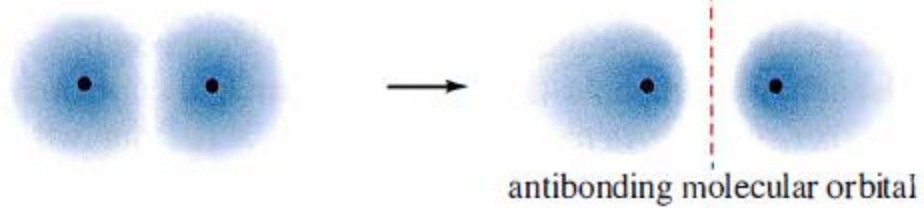
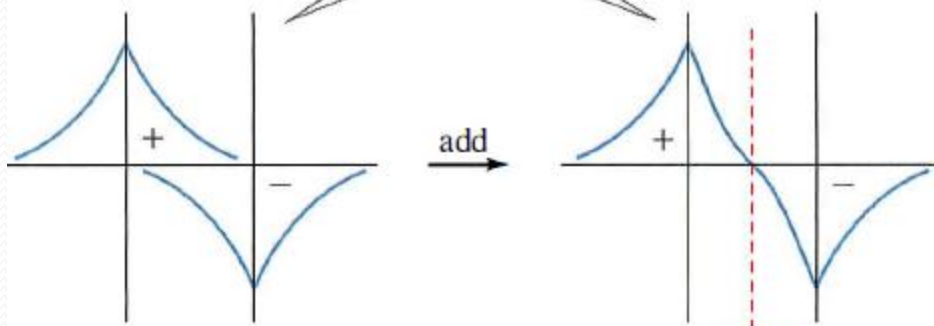


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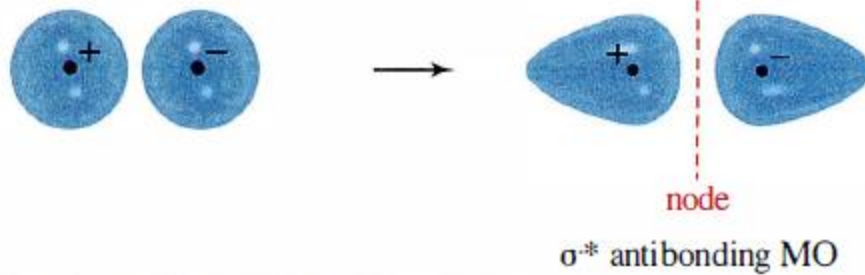


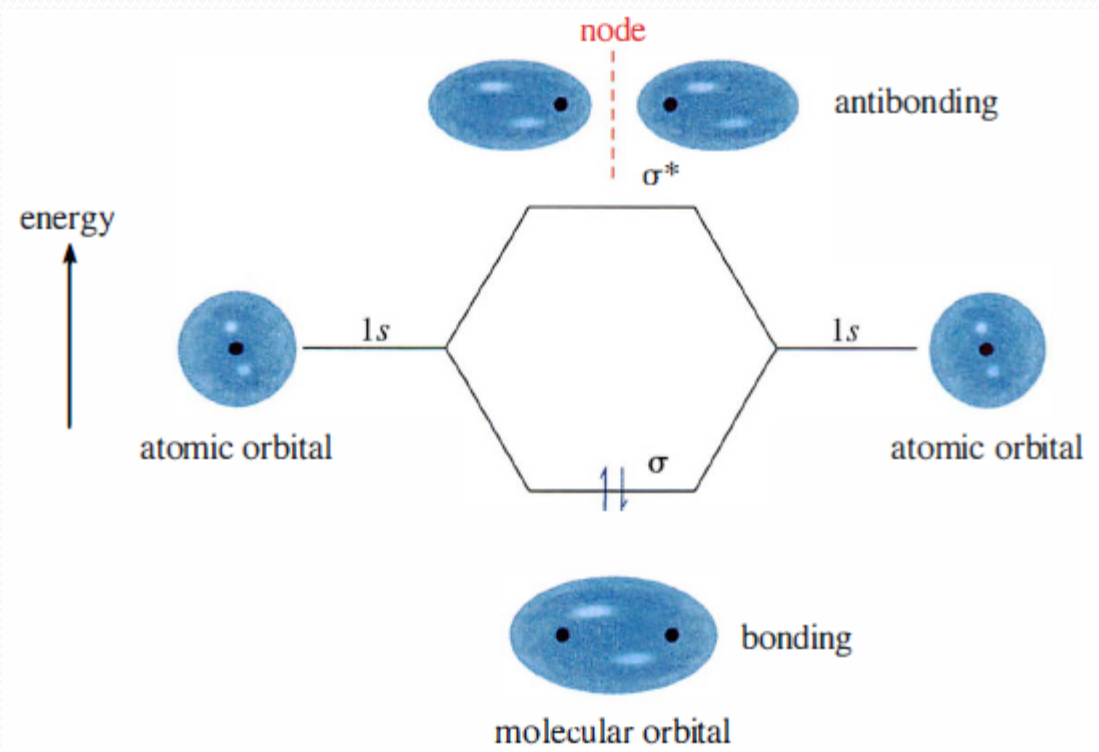
$\sigma$ -bonding MO

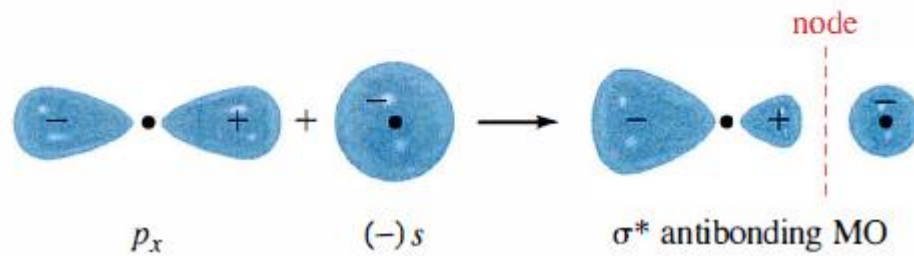
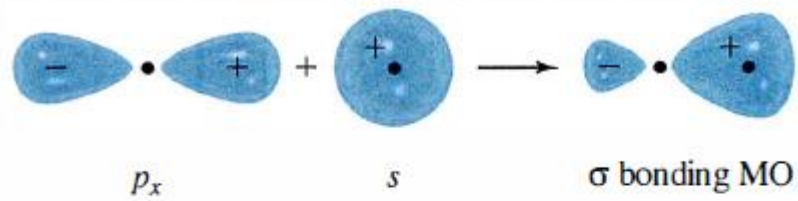
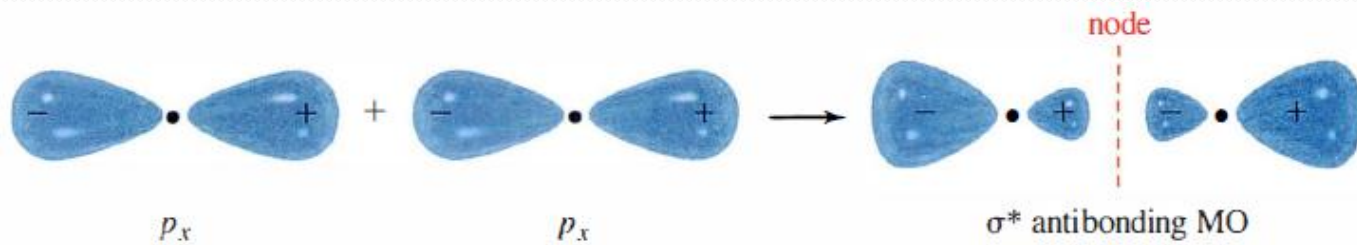
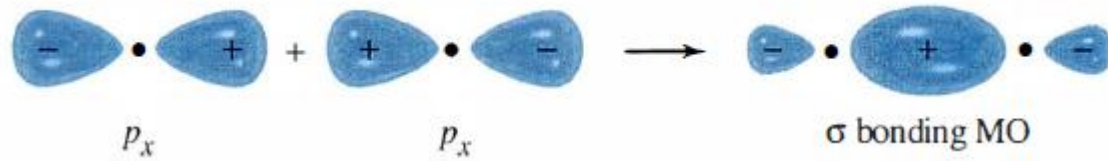
Destructive interaction: The two 1s orbitals are out of phase.

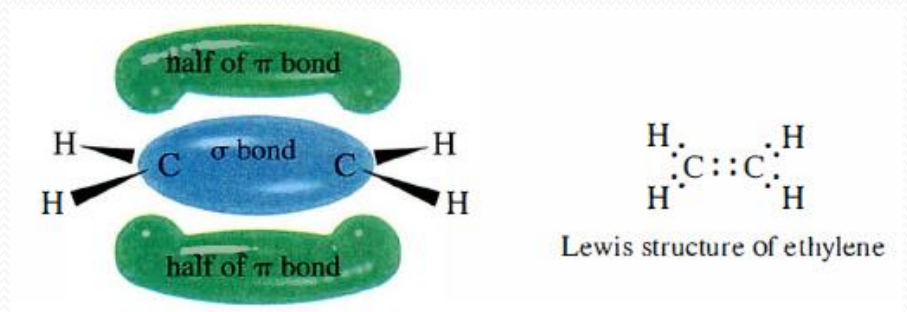
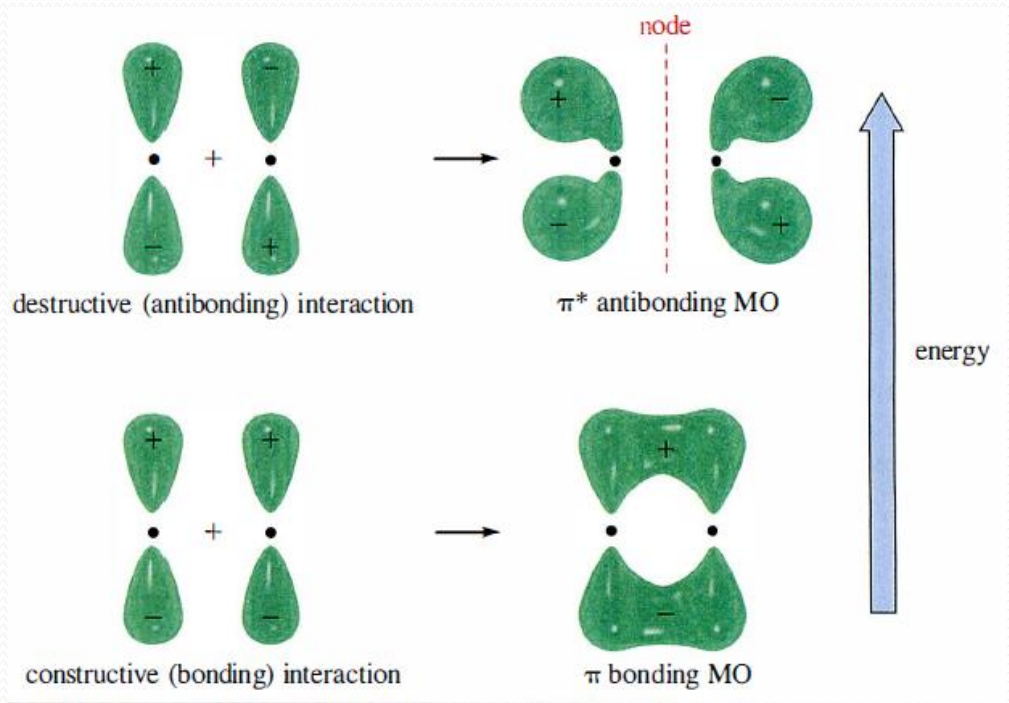


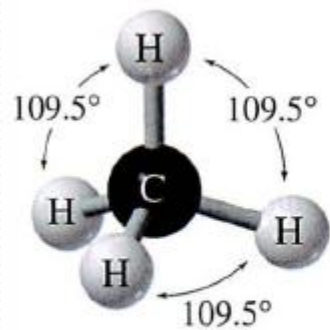
represented by:



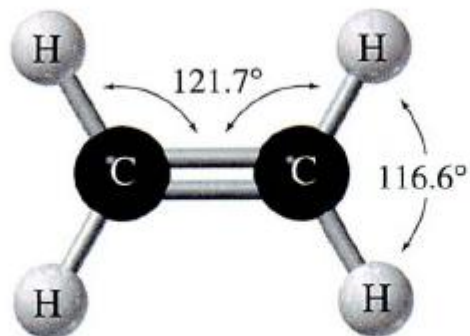




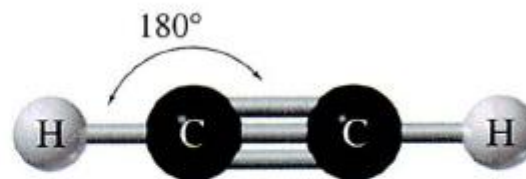




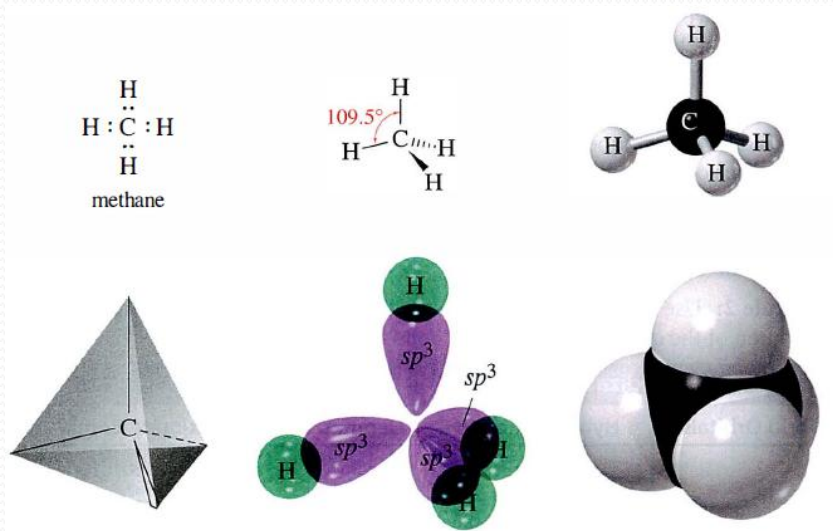
methane,  $109.5^\circ$

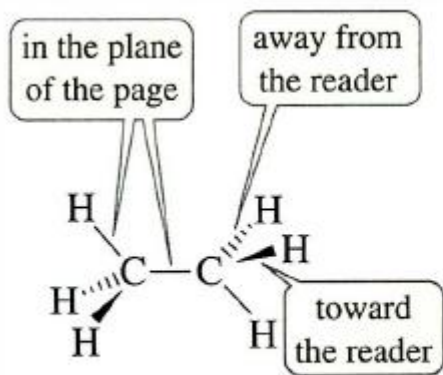


ethylene, close to  $120^\circ$

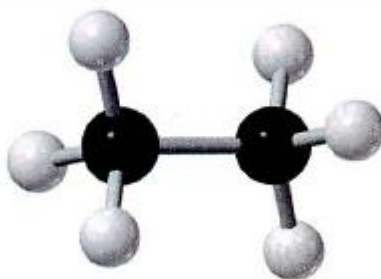


acetylene,  $180^\circ$





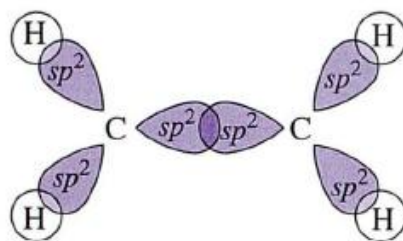
ethane



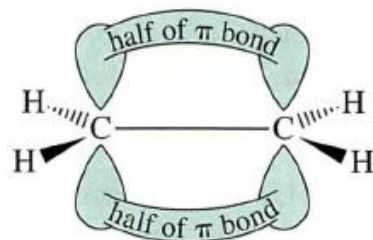
ethane



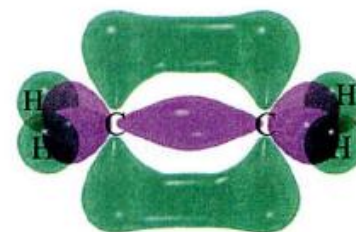
ethane



$\sigma$  bond framework  
(viewed from above the plane)

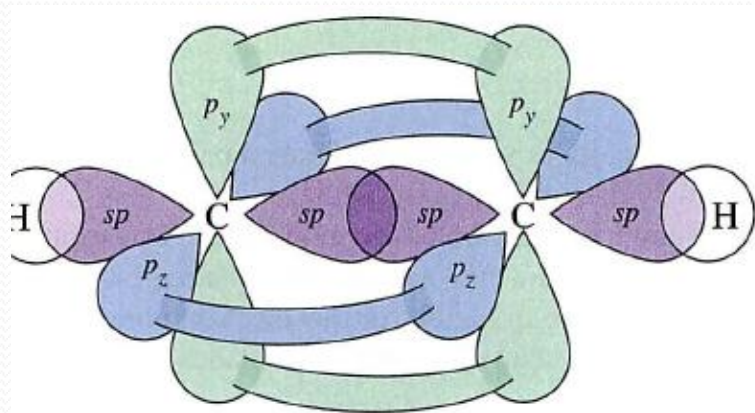


$\pi$  bond  
(viewed from alongside the plane)

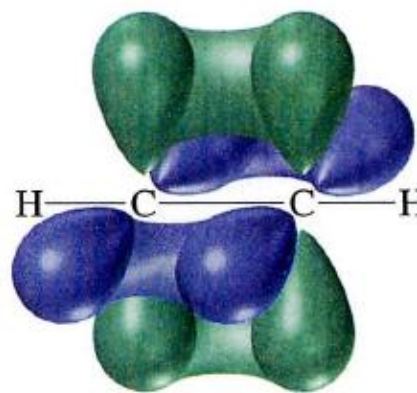


ethylene





acetylene



acetylene