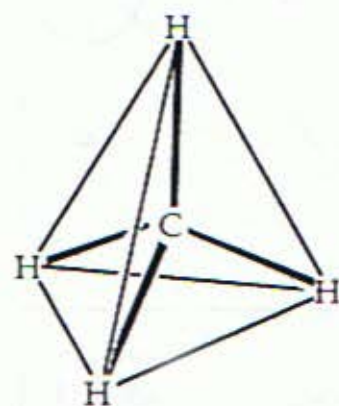


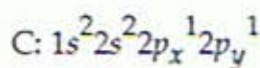
HYBRIDIZATION

Information

Methane is tetrahedral.



HCH angle = 109.5°



Hybridization: mixing of atomic orbitals to give special orbitals for bonding.

$$\varphi_1 = 1/2[(s) + (p_x) + (p_y) + (p_z)]$$

$$\varphi_2 = 1/2[(s) + (p_x) - (p_y) - (p_z)]$$

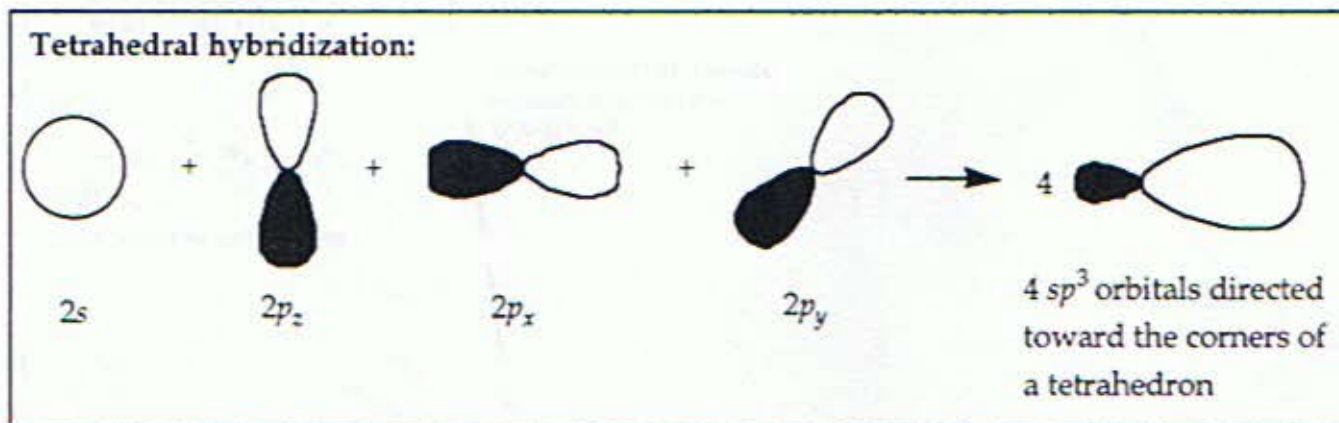
$$\varphi_3 = 1/2[(s) - (p_x) + (p_y) - (p_z)]$$

$$\varphi_4 = 1/2[(s) - (p_x) - (p_y) + (p_z)]$$

The number of hybrid orbitals produced is equal to the number of atomic orbitals combined.

isolated
sch. eq is solved $\rightarrow \infty$ solutions
C only those orbitals occupied e^-
higher E solution = hybrid orbitals
not the most stable
But higher E solutions?
we don't pay attention to it in an isolated C
But you get strong bonds makes molec more stable
So hybridize to make strong bond

2s 2p like vectors
new vec. after add = hybrid orbitals
guideline X orbitals = X hybrid orbitals
4 orbitals = 4 hybrid orbitals



of hybrid orbitals = # of σ bonds + # of lone pairs.
of hybrid orbitals = # of atomic orbitals combined.
Lone pair takes up more space than bonding pairs thus they compress the bond angle.