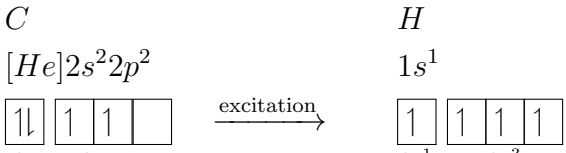
Hybridization

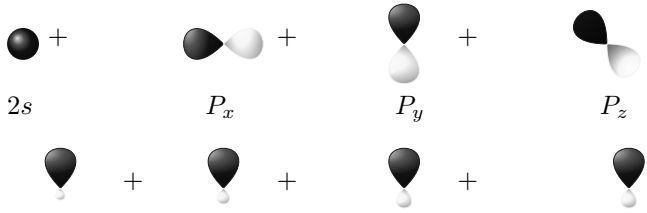
CH_4

<u>According to VBT</u>



- CH_4 has 4 σ-bond
- $2s - 1s$ Overlap $\Rightarrow$ 1 σ-bond
- $2p - 1s$ Overlap $\Rightarrow$ 3 σ-bonds at angle of 90°
- Strength: $2s - 1s < 2p - 1s$

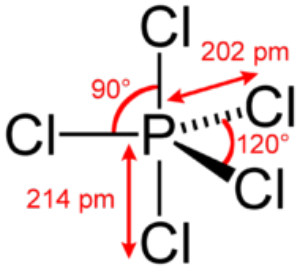
Hybridization:- Intermixing of pure atomic orbitals and form new hybrid orbitals
Eg. - CH_4



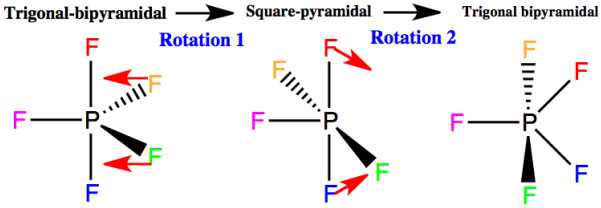
Hybrid Orbitals

- Hybridization $= \sigma +$ lone pair
- **Example:-** $sp^3 = s + p_x + p_y + p_z$

- $sp < sp^2 < sp^3$
- **Example:-** PCl_5



- **Example:-** PF_5


Trigonal-bipyramidal
Rotation 1
Square-pyramidal
Rotation 2
Trigonal bipyramidal
F
F
F
P
F
F
F
F
F
P
F
F
F
F
P
F
F
F