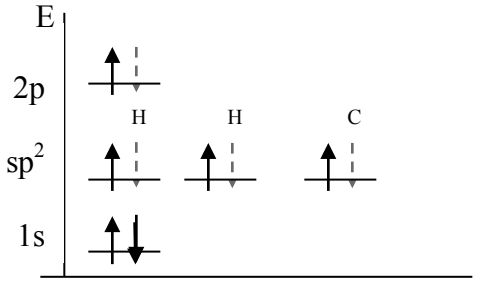
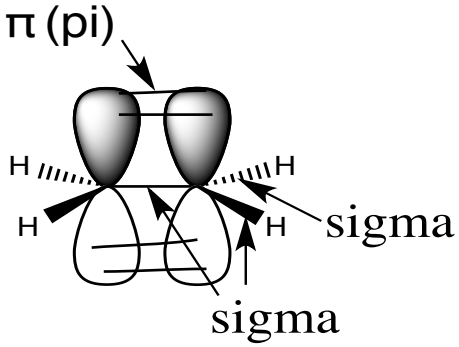
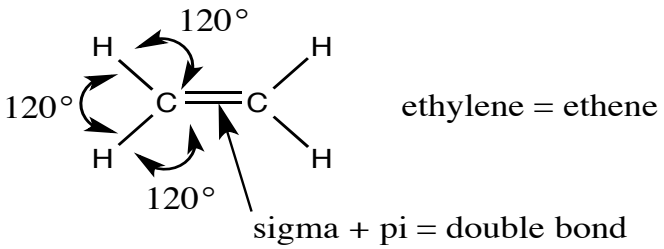
sp^2 Hybridization

- Double bonds
- Planar geometry
- Angle between two atoms: 120°
- No free rotation around double bonds
- Overlap of atomic orbitals with s component gives sigma molecular orbital (bond)
- Overlap of p atomic orbitals with another p gives pi molecular orbital (bond)

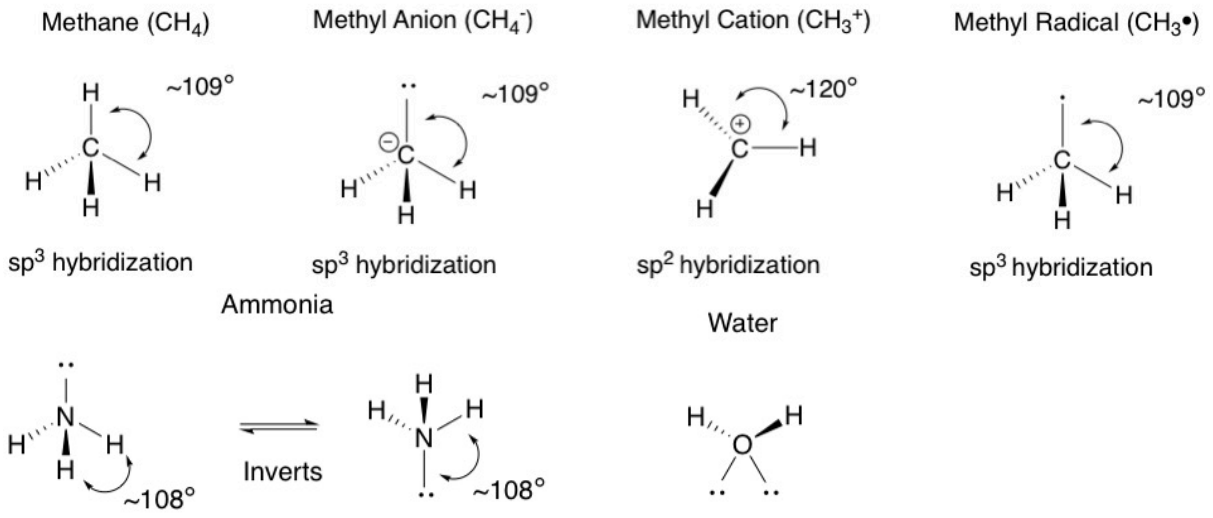






- Each line in a structure represents 2 e^-
- Solid wedge (◀): Toward you / out of the page
- Dashed wedge (⋯⋯): Away from you / into the page

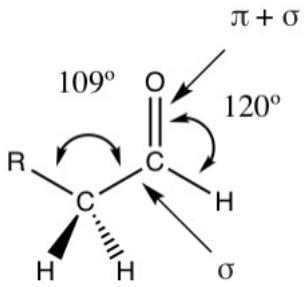
Hybridization (sp^3 vs sp^2)



Hybridization (sp^3 vs sp^2) cont.

no free rotation around double bonds (overlap of p orbitals to form pi (π) bond prevents that)
e.g.

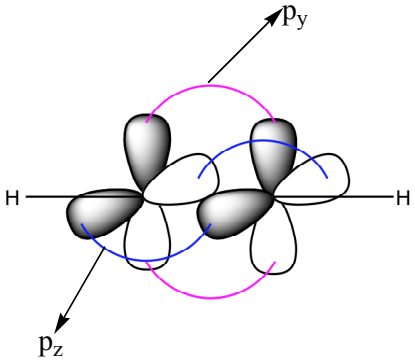
1. **Aldehyde**



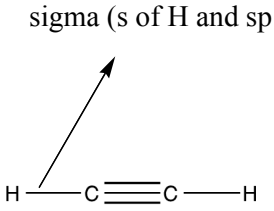
The CH_2 is sp^3 hybridized, the atoms attached to it have a bond angle of 109º
The carbonyl carbon is sp^2 hybridized, the atoms attached to it have a bond angle of 120º
The oxygen contains two lone pairs (not drawn), it is sp^2 hybridized

Hybridization: sp

- Triple bonds
- Linear geometry
- No free rotation around triple bonds



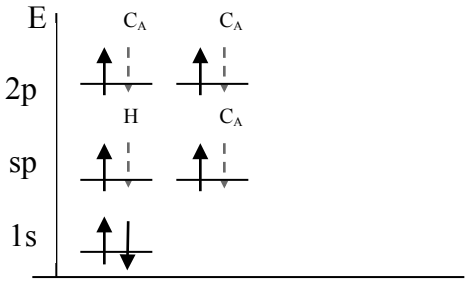
Triple bond:
One sigma bond between the carbons plus two pi bonds formed through p_y and p_z



acetylene = ethyne

sp Hybridization

- Triple bonds
- Linear geometry
- No free rotation around triple bonds
- Angle between two atoms: 180°



e.g. Acetylene/Ethyne