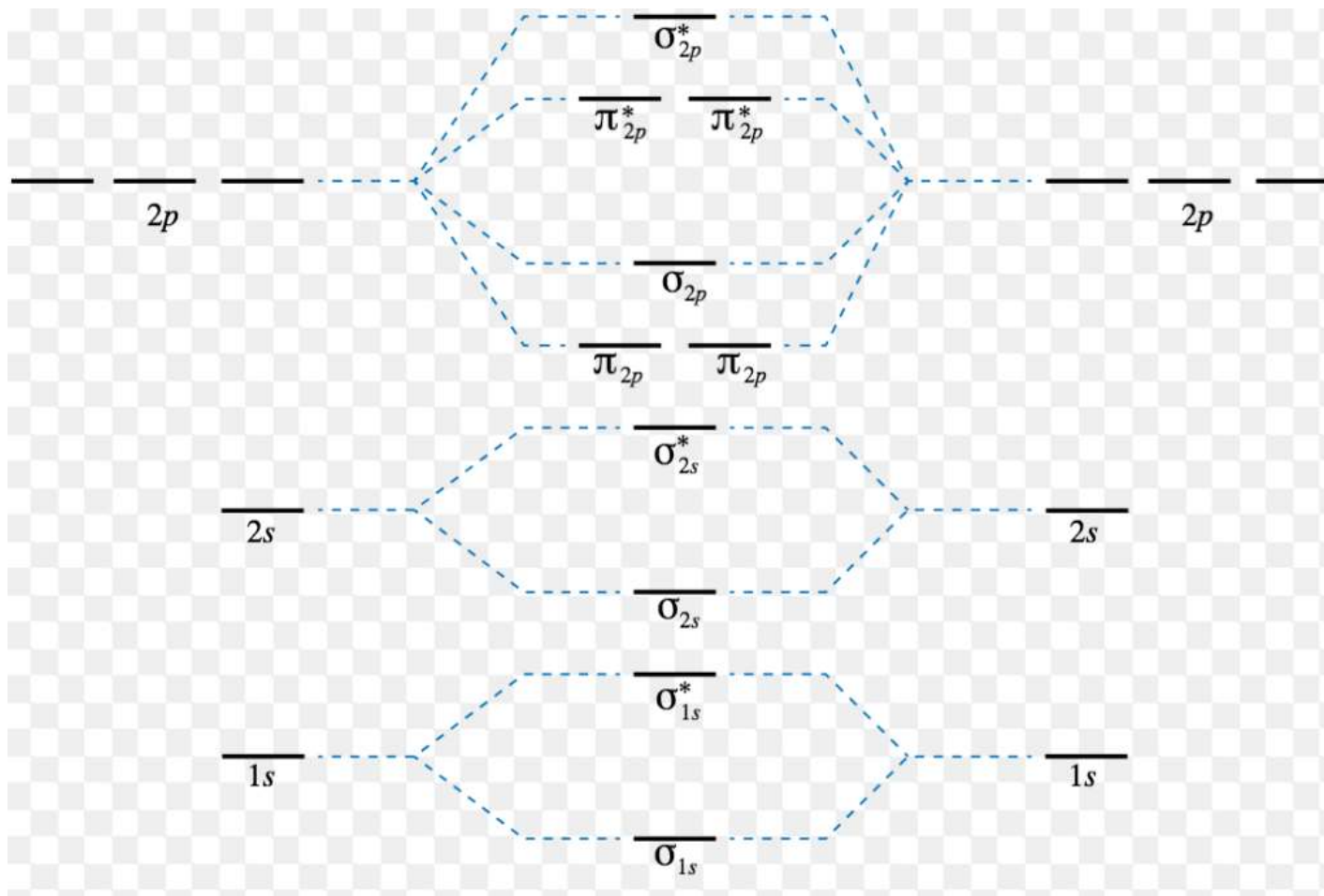


WELCOME

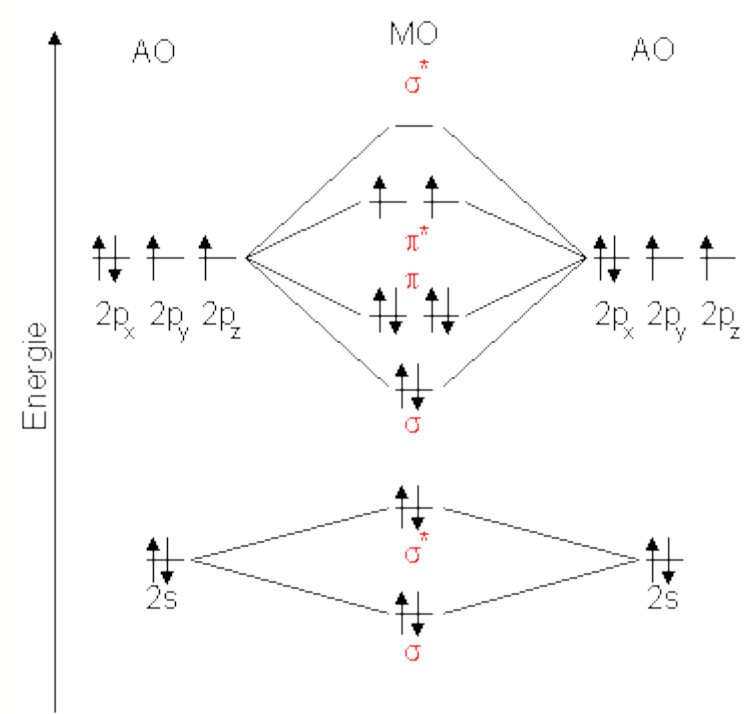
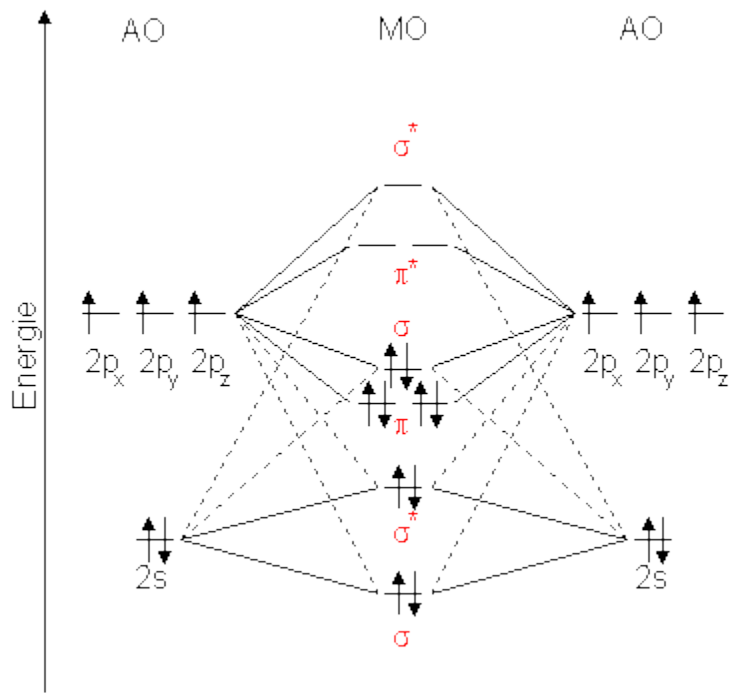
**MOLECULAR ORBITAL
THEORY**

**Moly PP
Chemistry**

ENERGY LEVEL DIAGRAMS FOR MOLECULAR ORBITALS

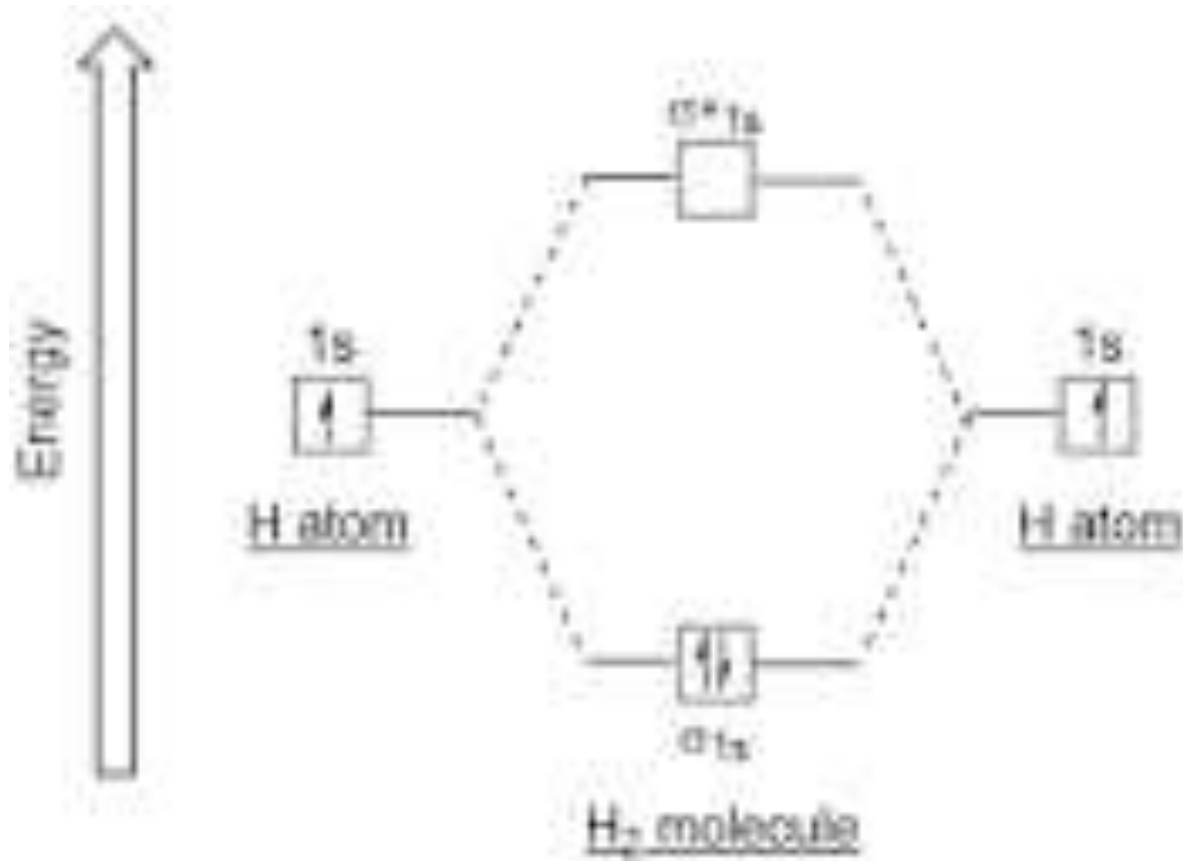


Why is the σ -MO formed by the 2p AOs energetically above the π -MO for N₂ but not for O₂



- All the elements in the second period before oxygen have the difference in energy between the 2s and 2p orbital small enough, so that s-p mixing (combination) can occur lowering the energy of the $\sigma(2s)$ and $\sigma^*(2s)$ and increasing the energy of the $\sigma(2p)$ and $\sigma^*(2p)$ molecular orbitals.
- By moving towards right in a period, the s orbital gets more stabilized than the p orbital and the difference in their energies increases, making the s-p mixing for oxygen much smaller.

MOLECULAR ORBITALELECTRONIC CONFIGURATIONS OF DIATOMIC MOLECULES



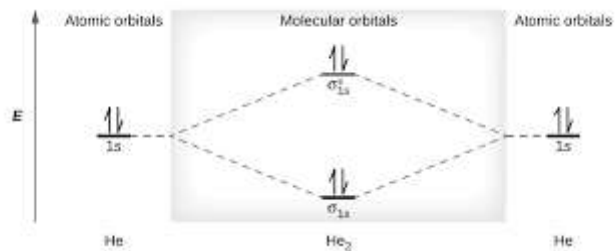
BOND ORDER CALCULATION & ITS SIGNIFICANCE

- **Bond order** = [(Number of electrons in **bonding** molecules) - (Number of electrons in antibonding molecules)]/2.
- Bond order and bond length indicate the type and strength of covalent bonds between atoms.
- Bond order and length are inversely proportional to each other: when bond order is increased, bond length is decreased.

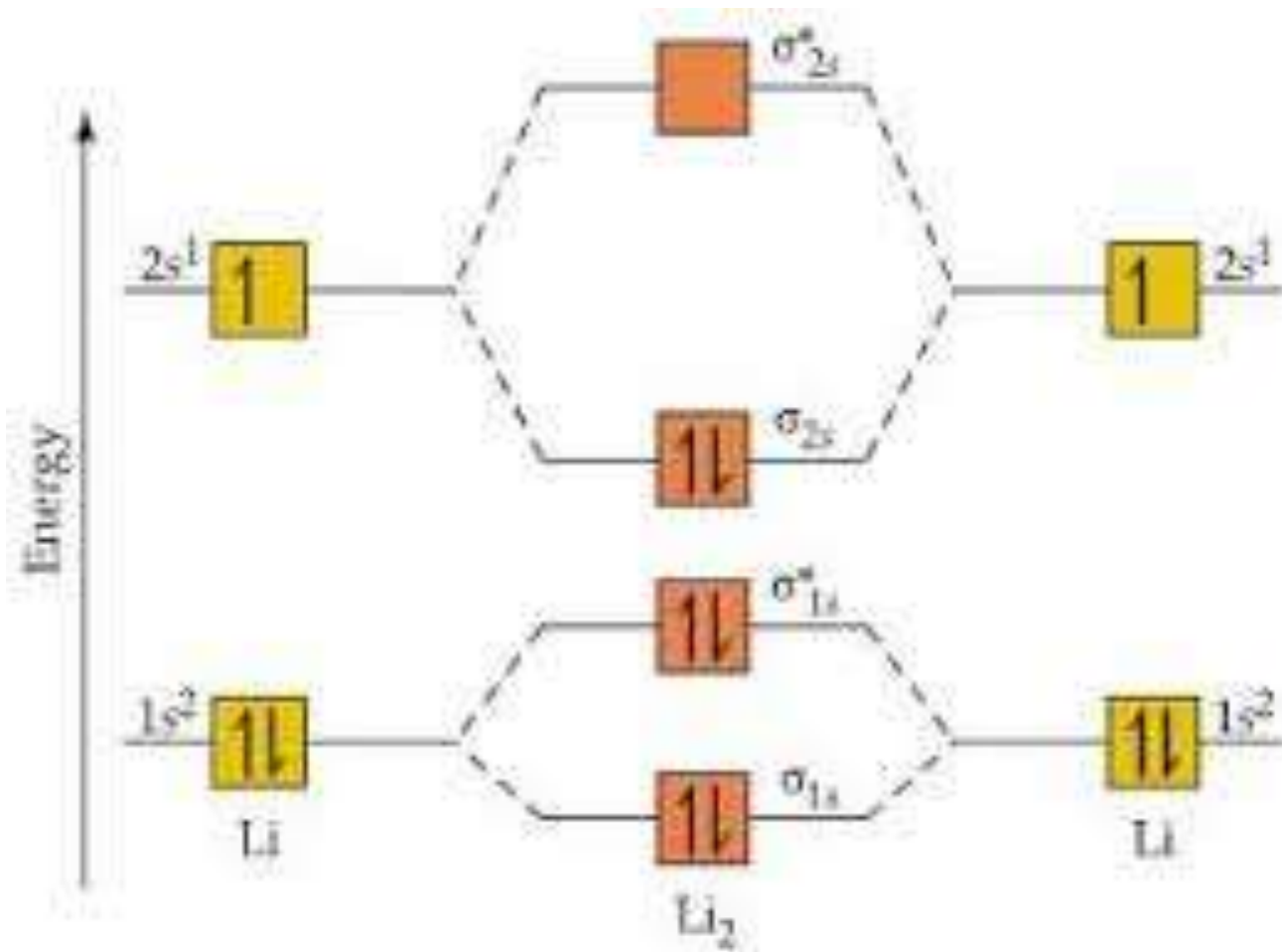
BOND ORDER VALUE

- 0: No bond
- 1: Single bond
- 2: double bond
- 3: triple bond

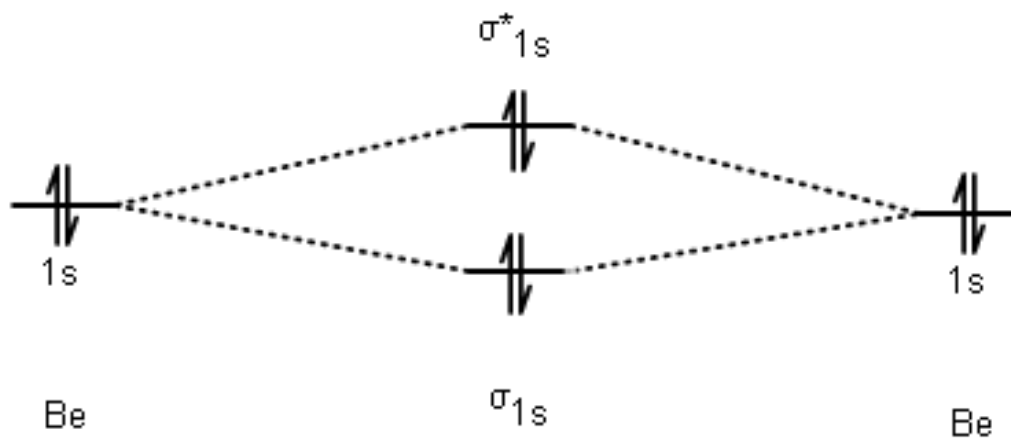
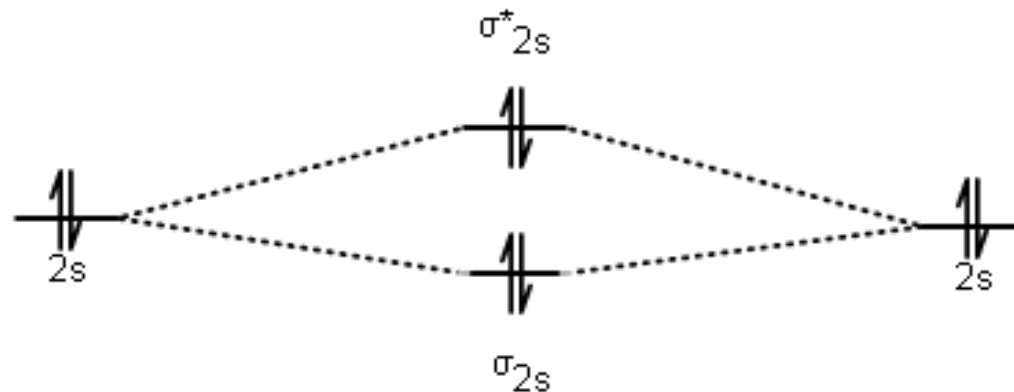
MO DIAGRAM OF HELIUM MOLECULE



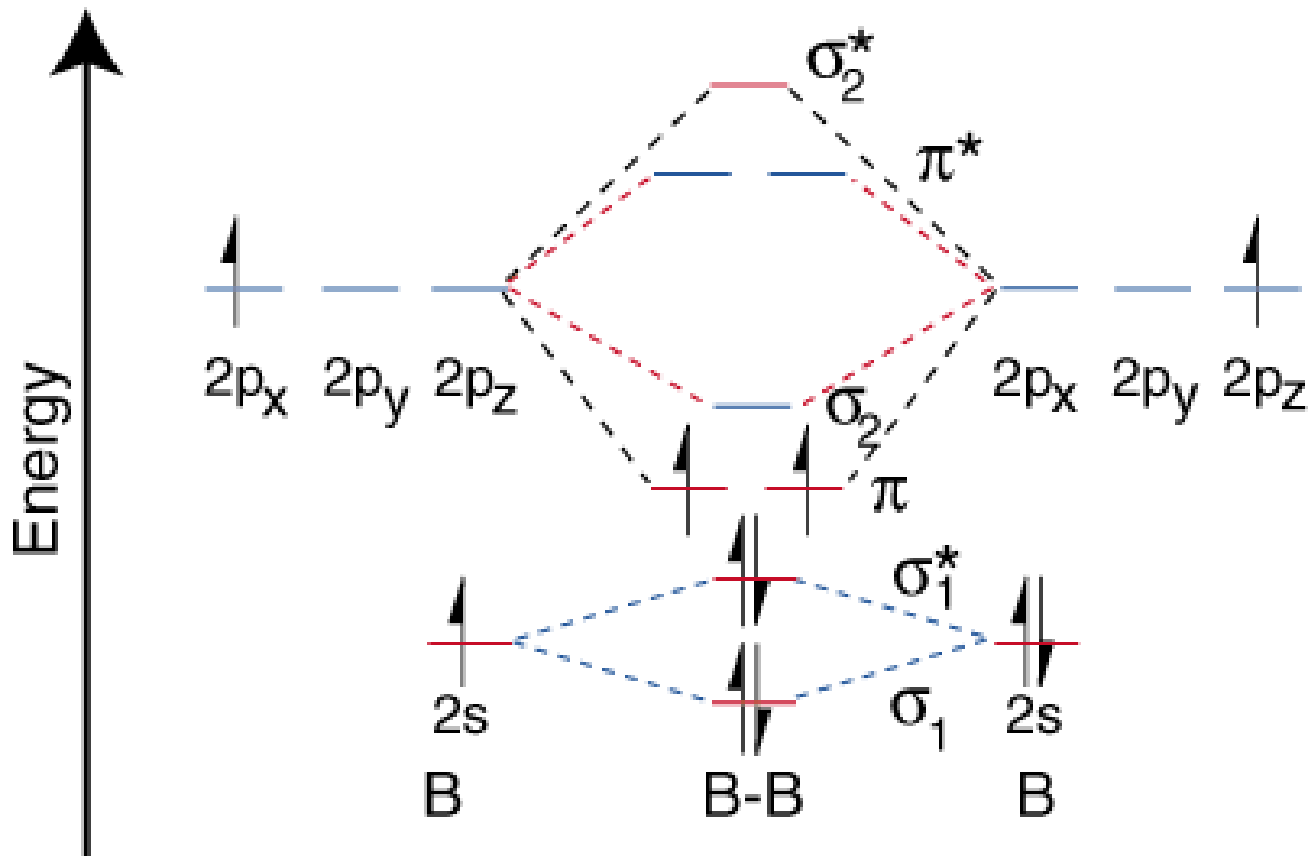
MO DIAGRAM OF LITHIUM MOLECULE



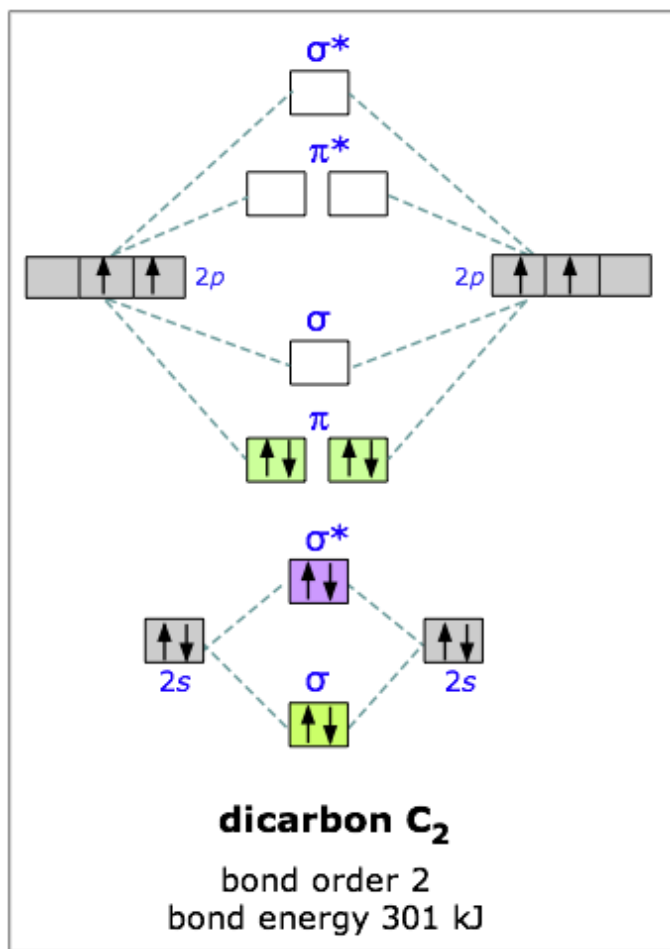
MO DIAGRAM OF BERILLIUM



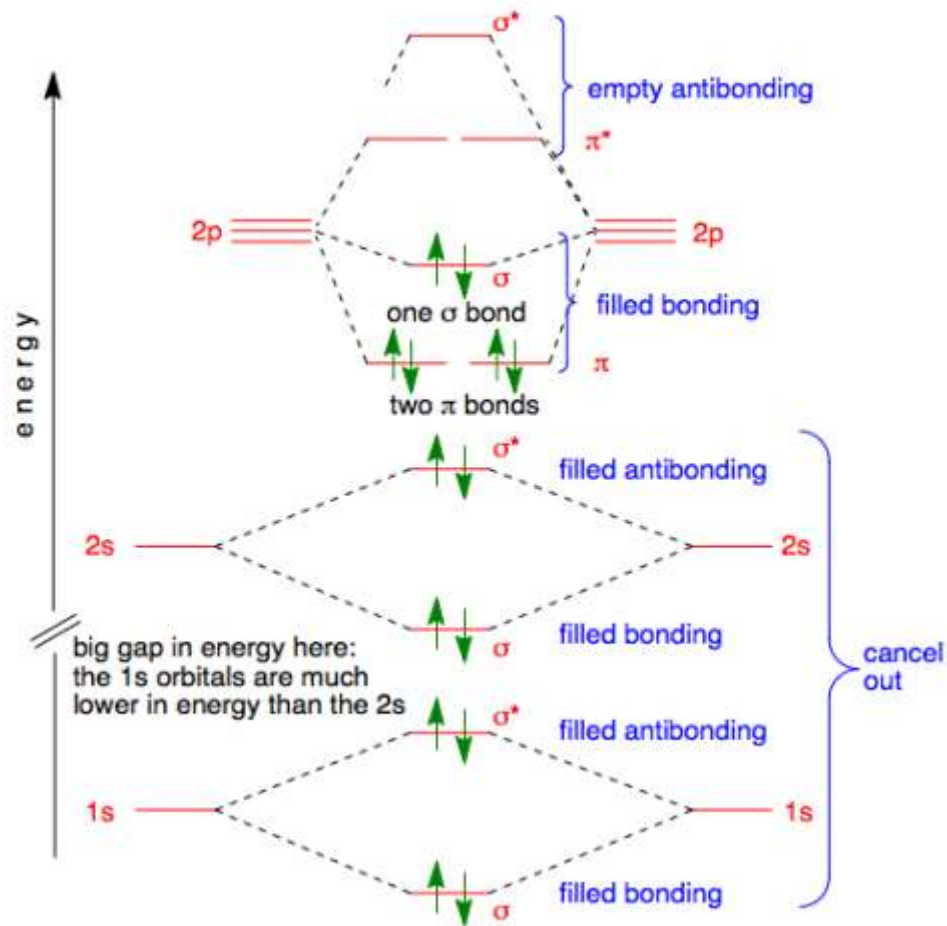
MO DIAGRAM OF BORON MOLECULE



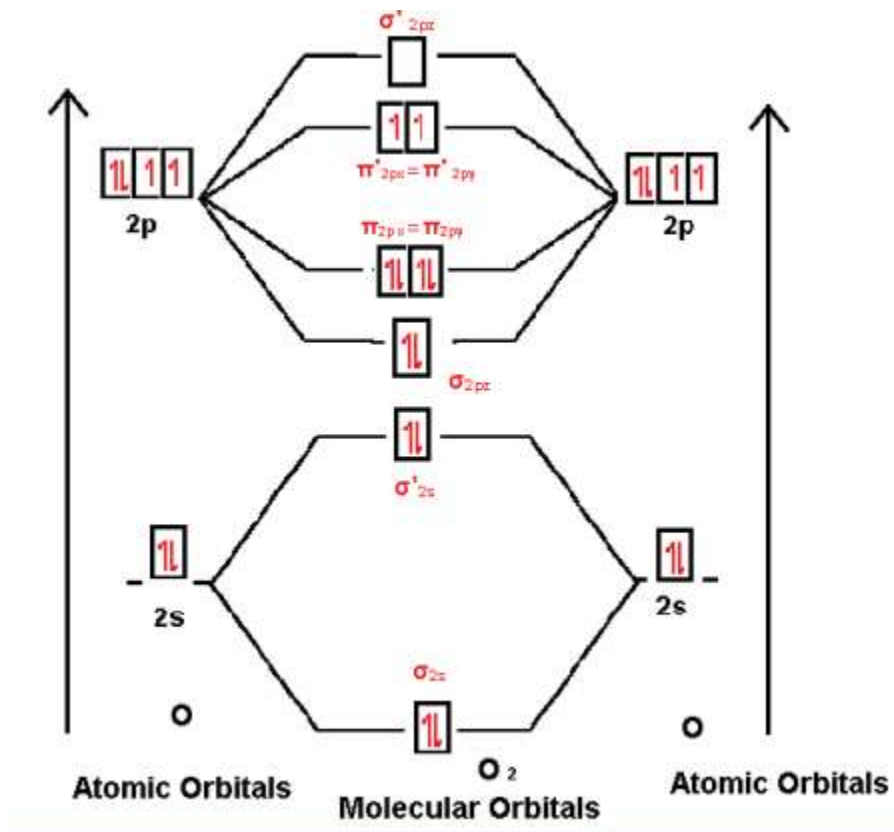
MO DIAGRAM OF CARBON MOLECULE



MO DIAGRAM OF NITROGEN MOLECULE



MO DIAGRAM OF OXYGEN MOLECULE



MO DIAGRAM OF FLUORINE MOLECULE

