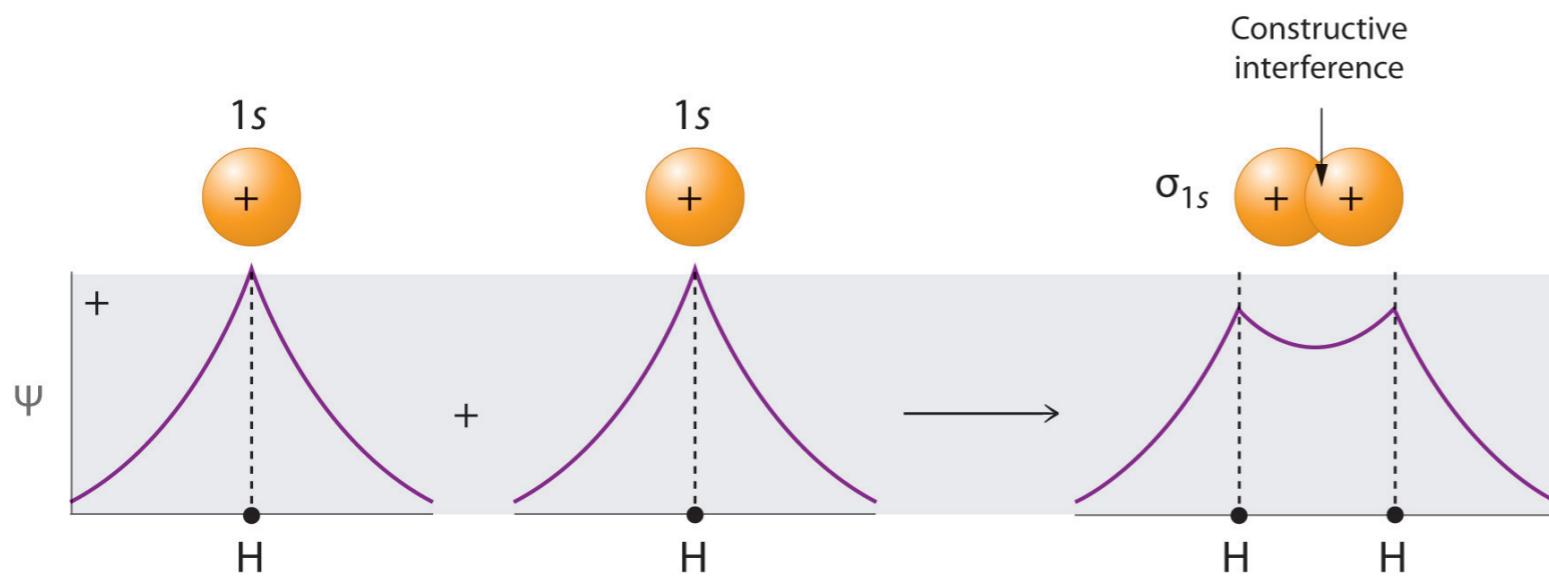
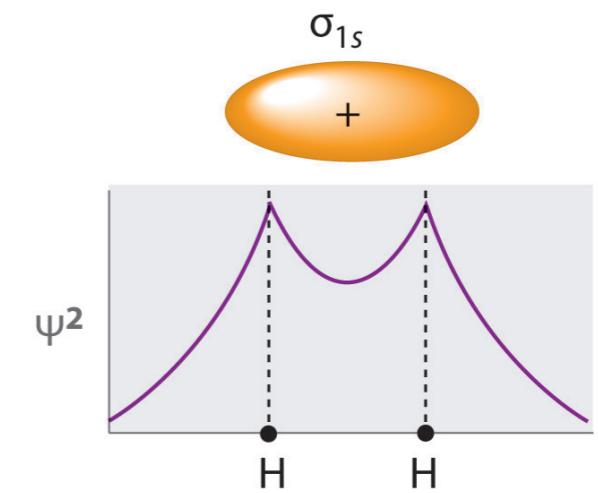


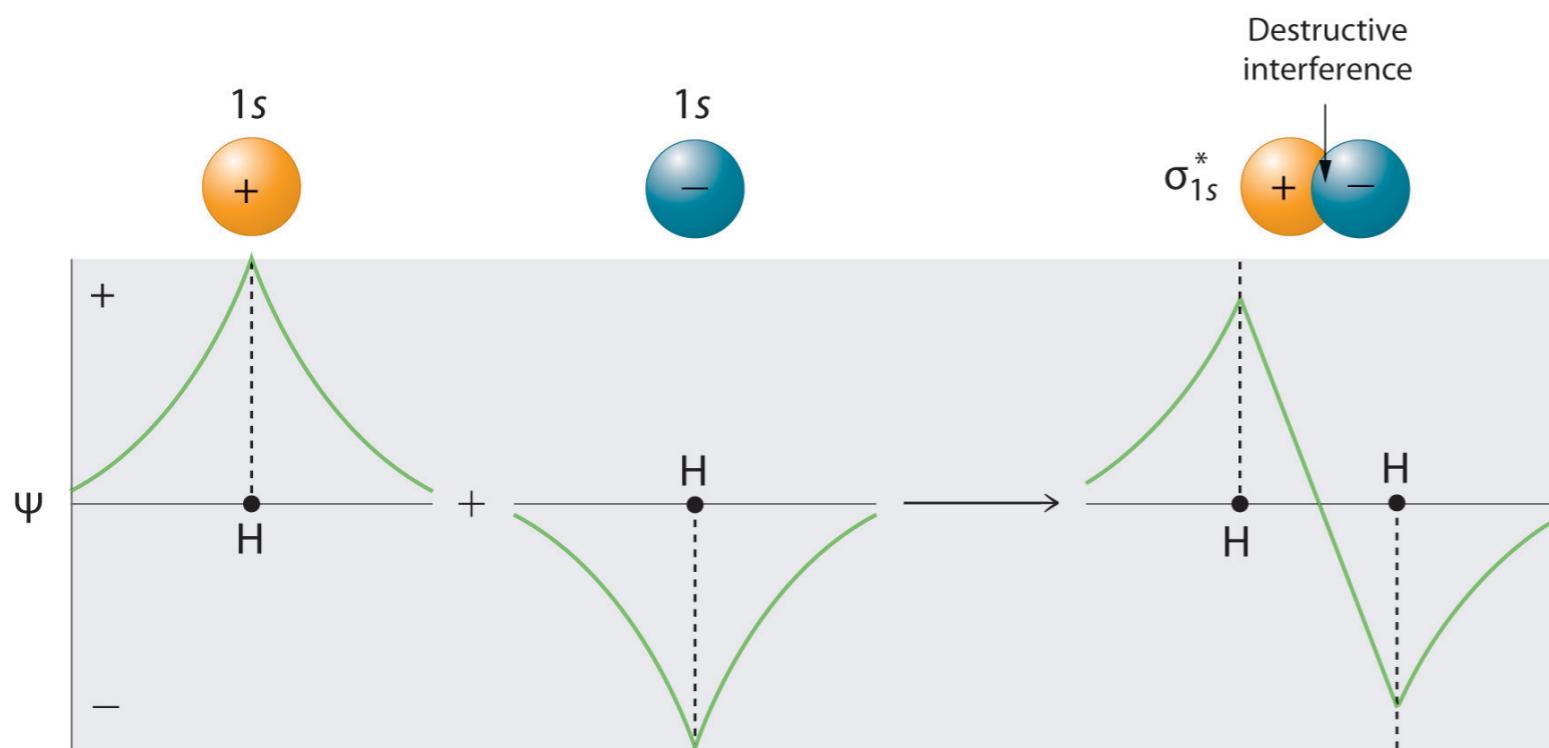
Orbitali molecolari



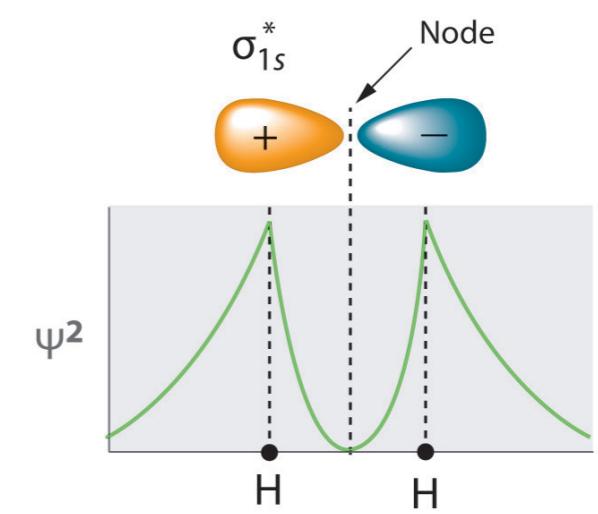
(a) Wave functions combined for σ_{1s}



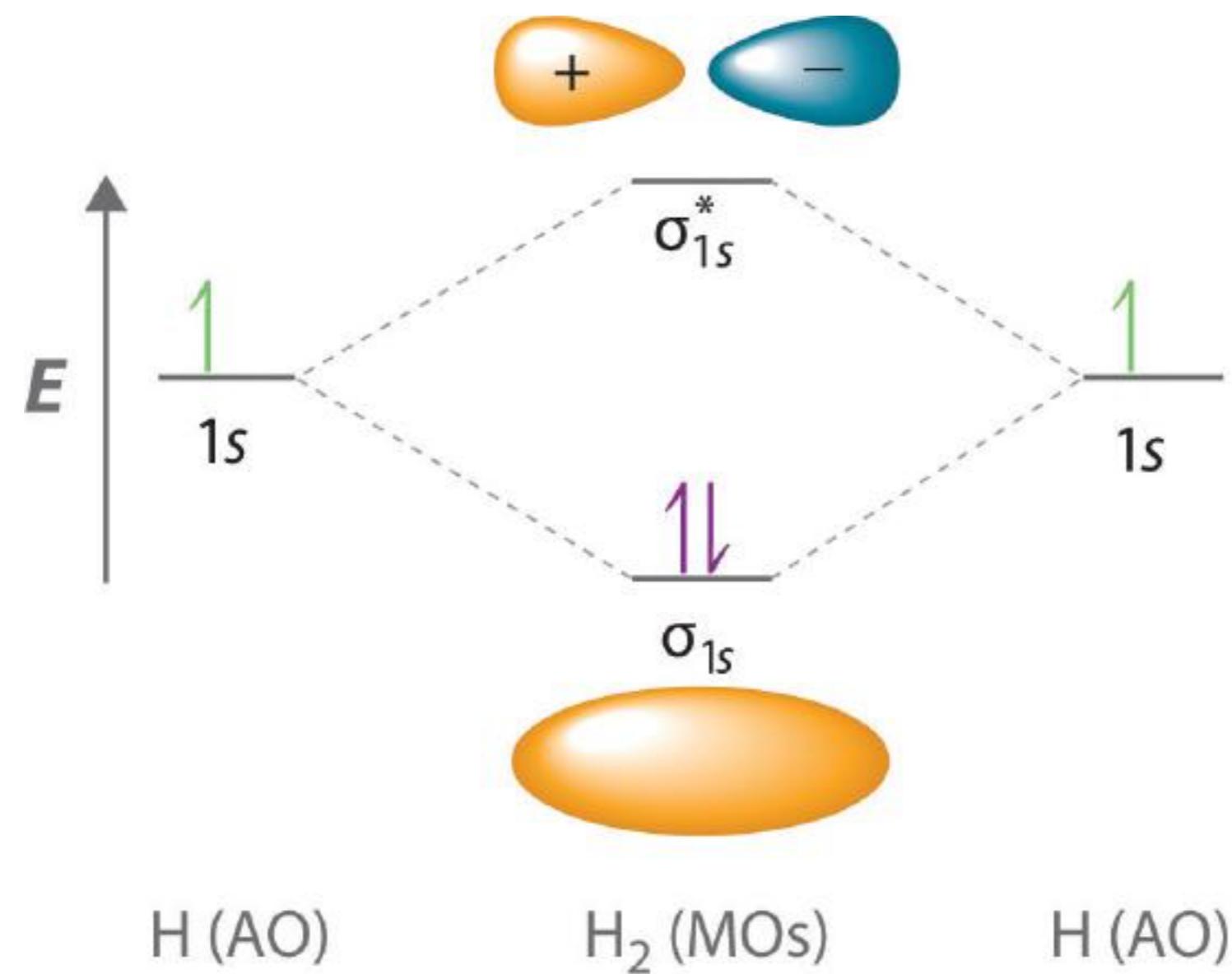
(b) Bonding probability density

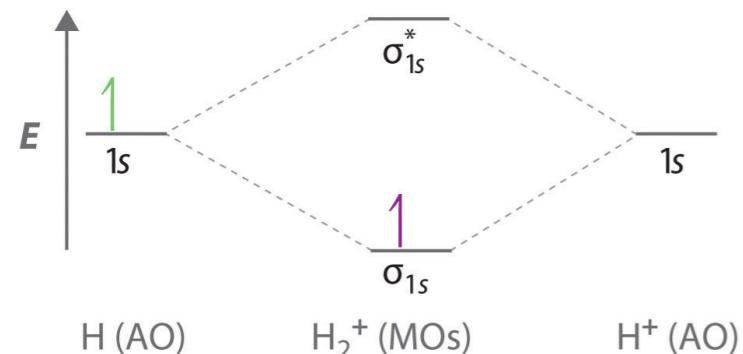


(c) Wave functions combined for σ_{1s}^*

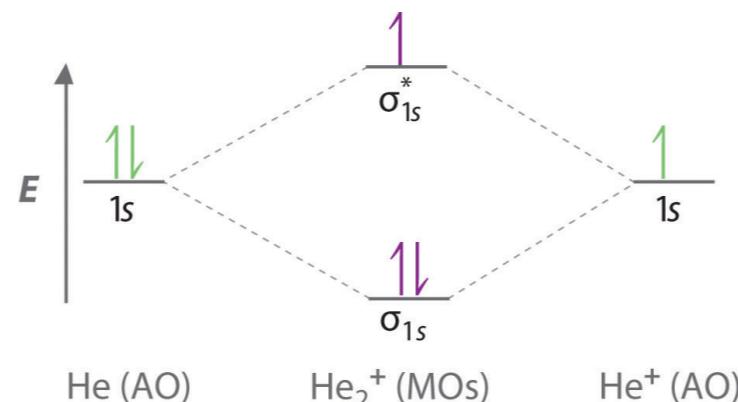


(d) Antibonding probability density

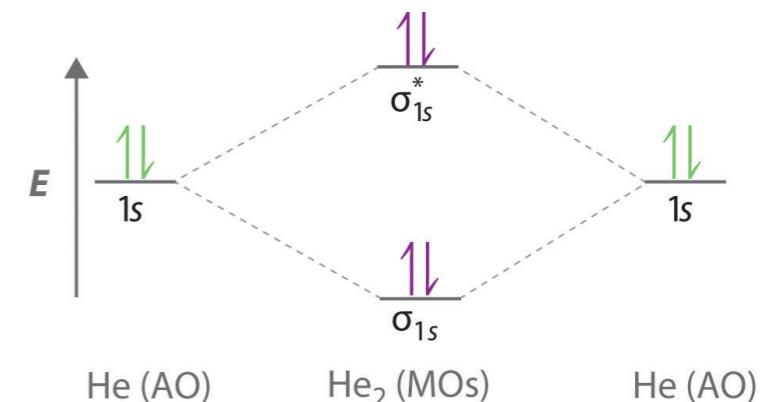




(a)

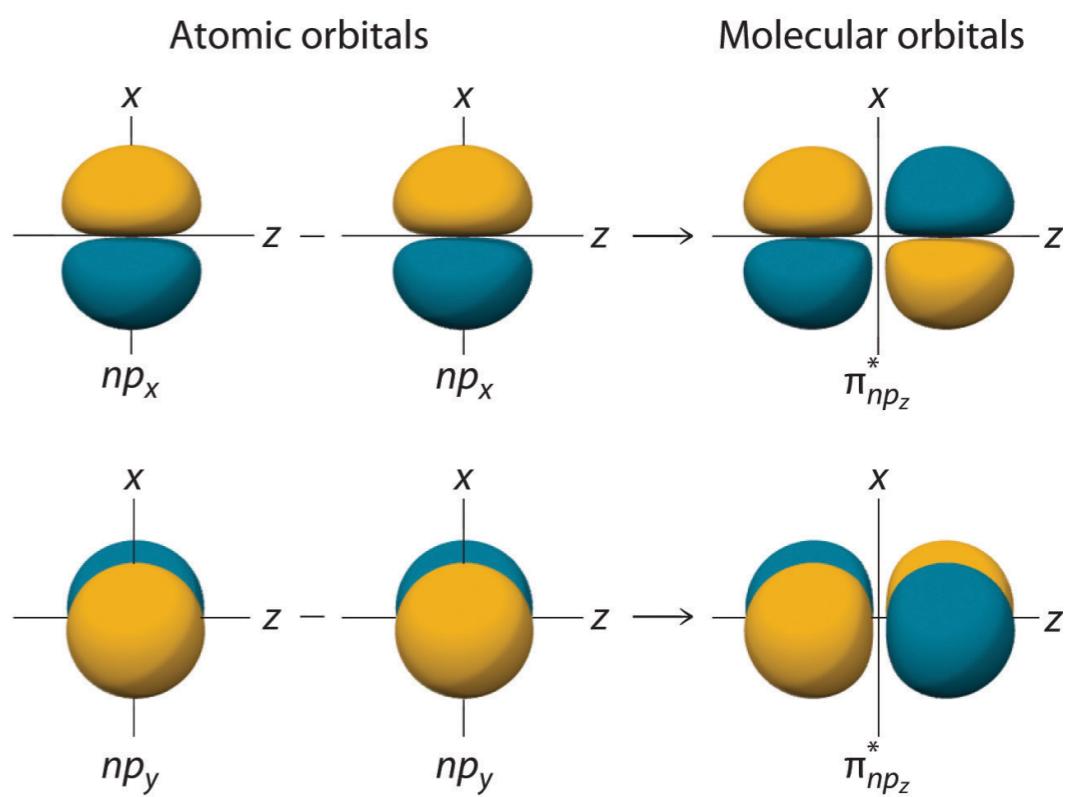
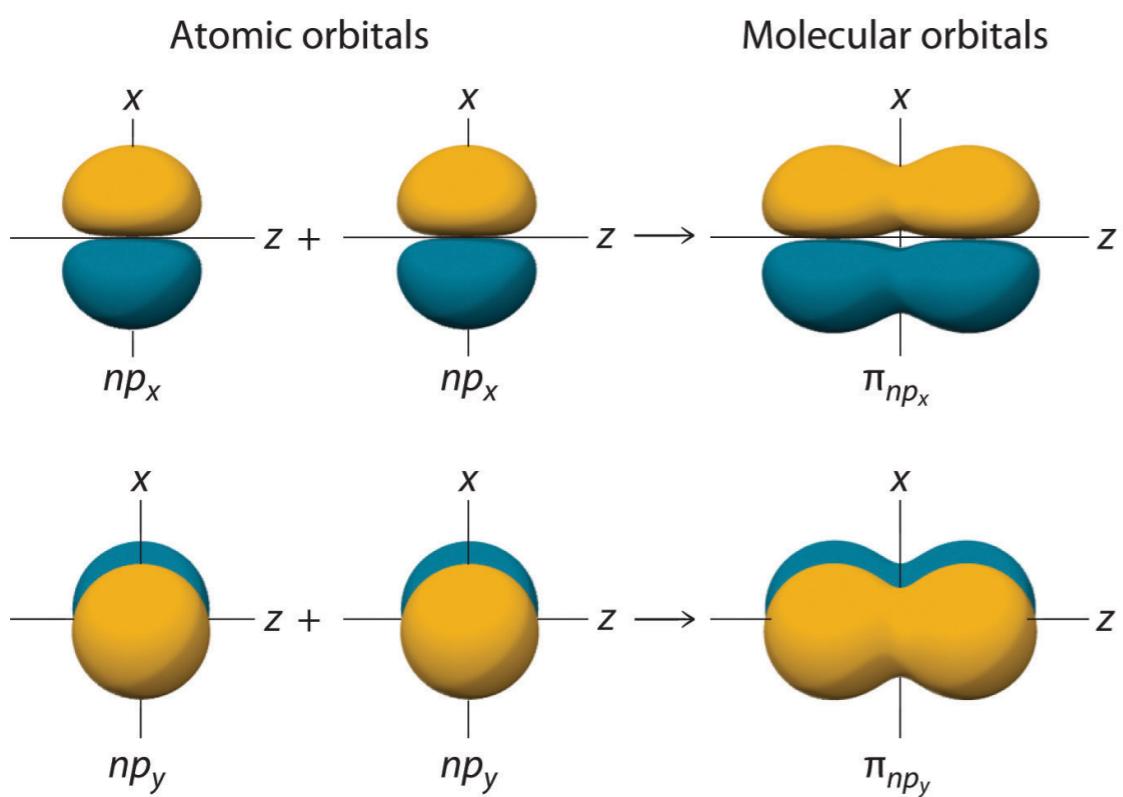


(b)



(c)

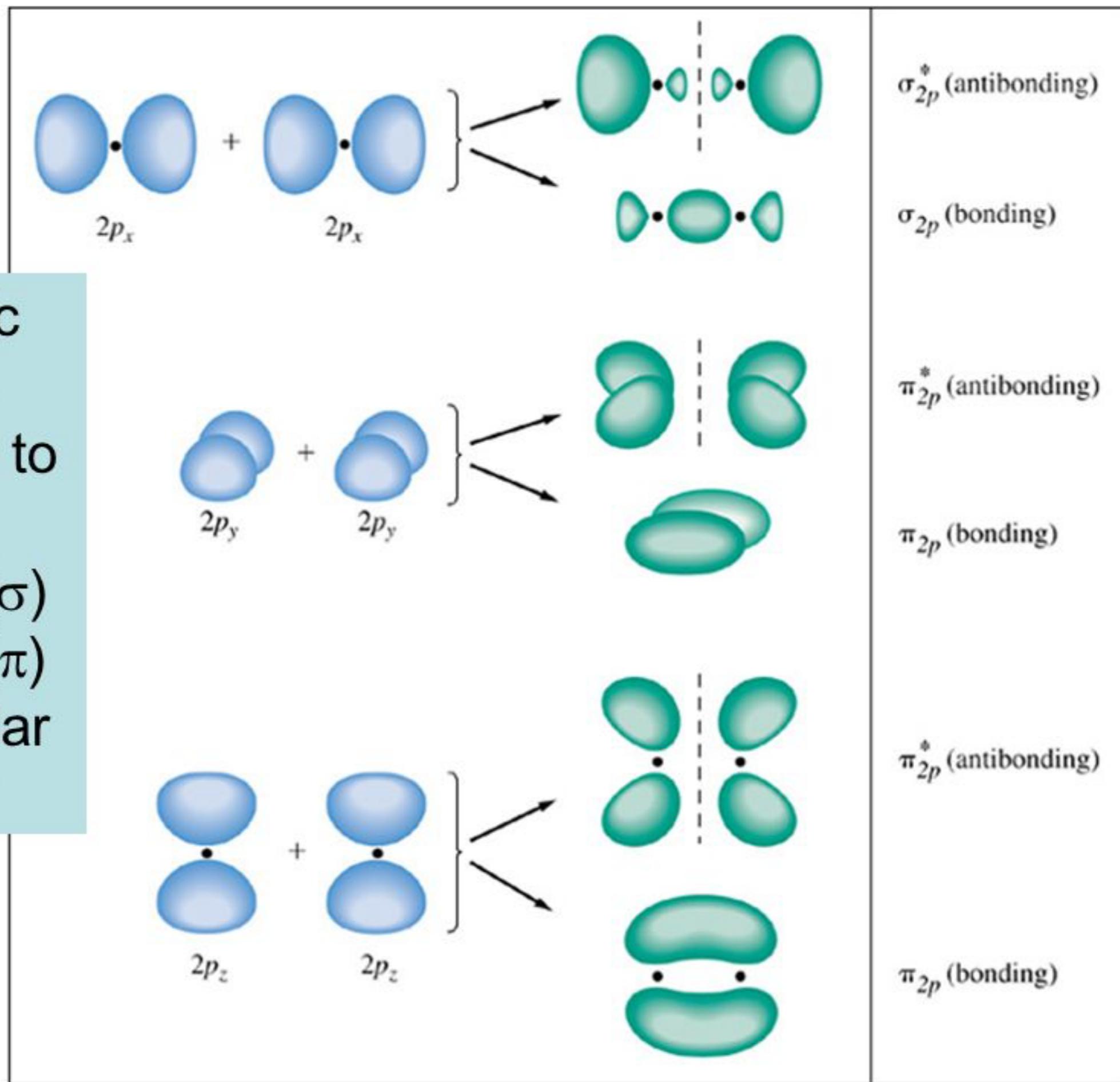
$$\text{Ordine di legame} = (\mathbf{N_b - N_a})/2$$



(a) Bonding

(b) Antibonding

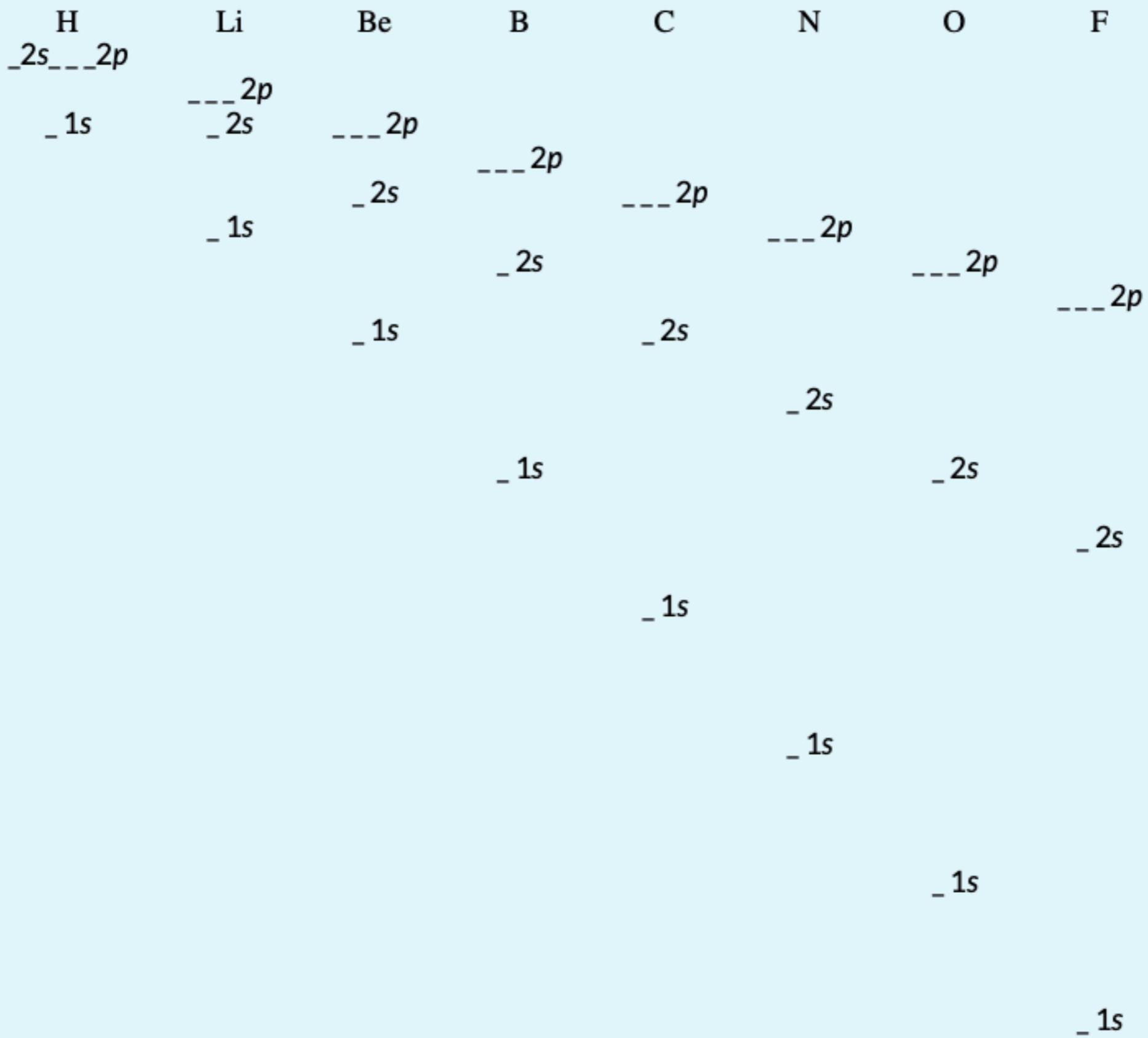
p atomic orbitals overlap to form sigma (σ) and pi (π) molecular orbitals

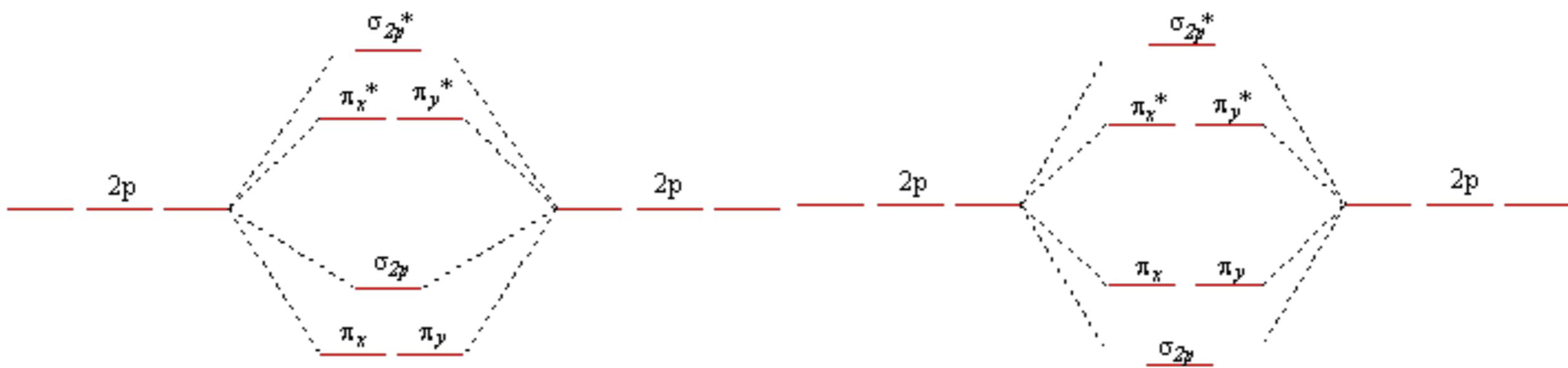


Regole generali

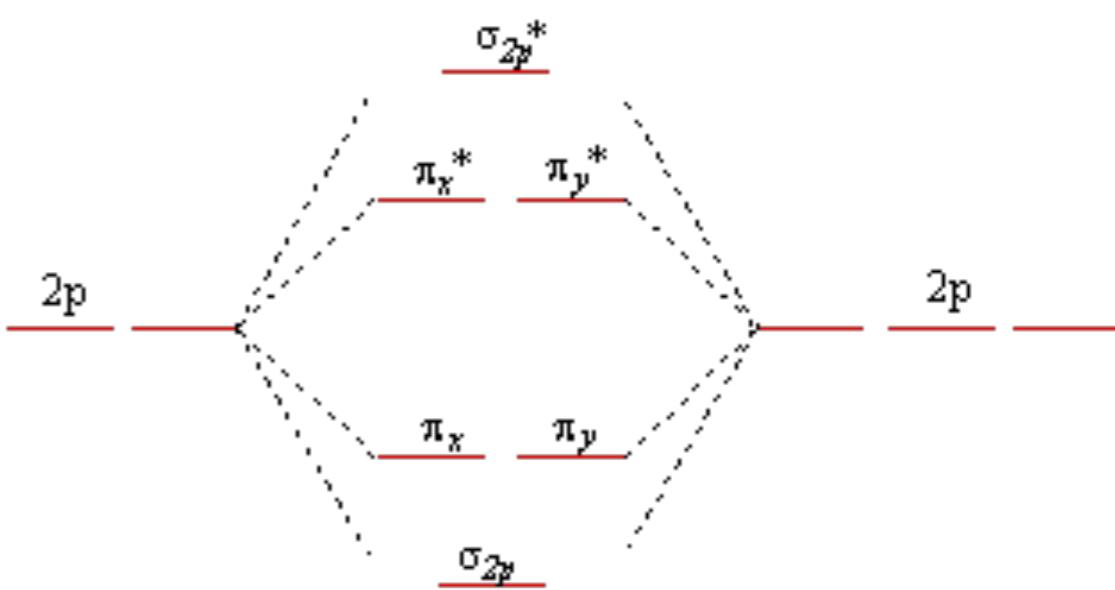
- Perché due orbitali atomici si possano combinare per dare una coppia di orbitali legame-antilegame devono avere possibilità di interferenza non nulla.
- Si combinano solo orbitali che abbiano energia paragonabile.
- Orbitali 2s e 2p si possono mescolare (sp mixing)

Variation of energy levels for atomic orbitals of some elements

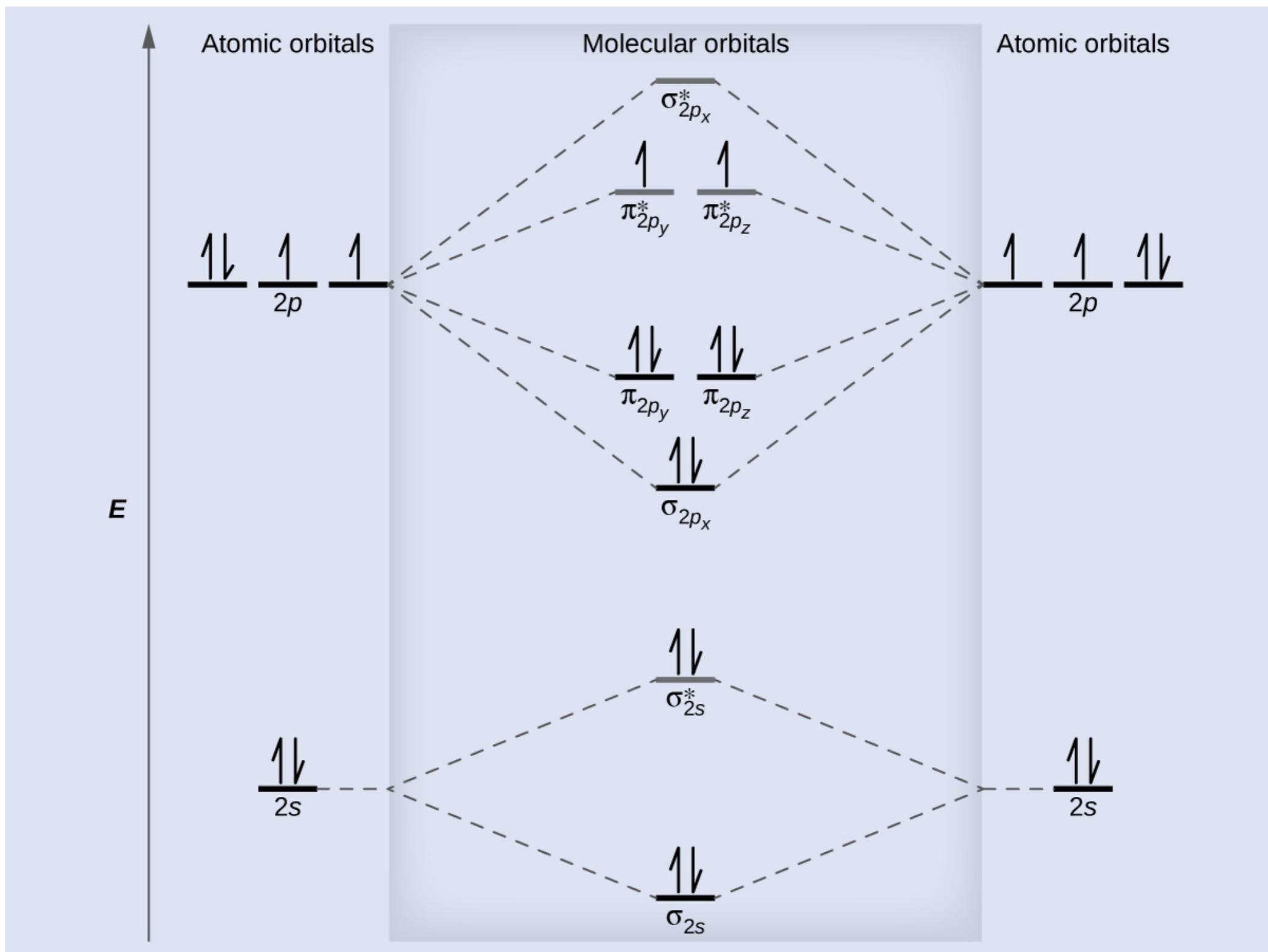


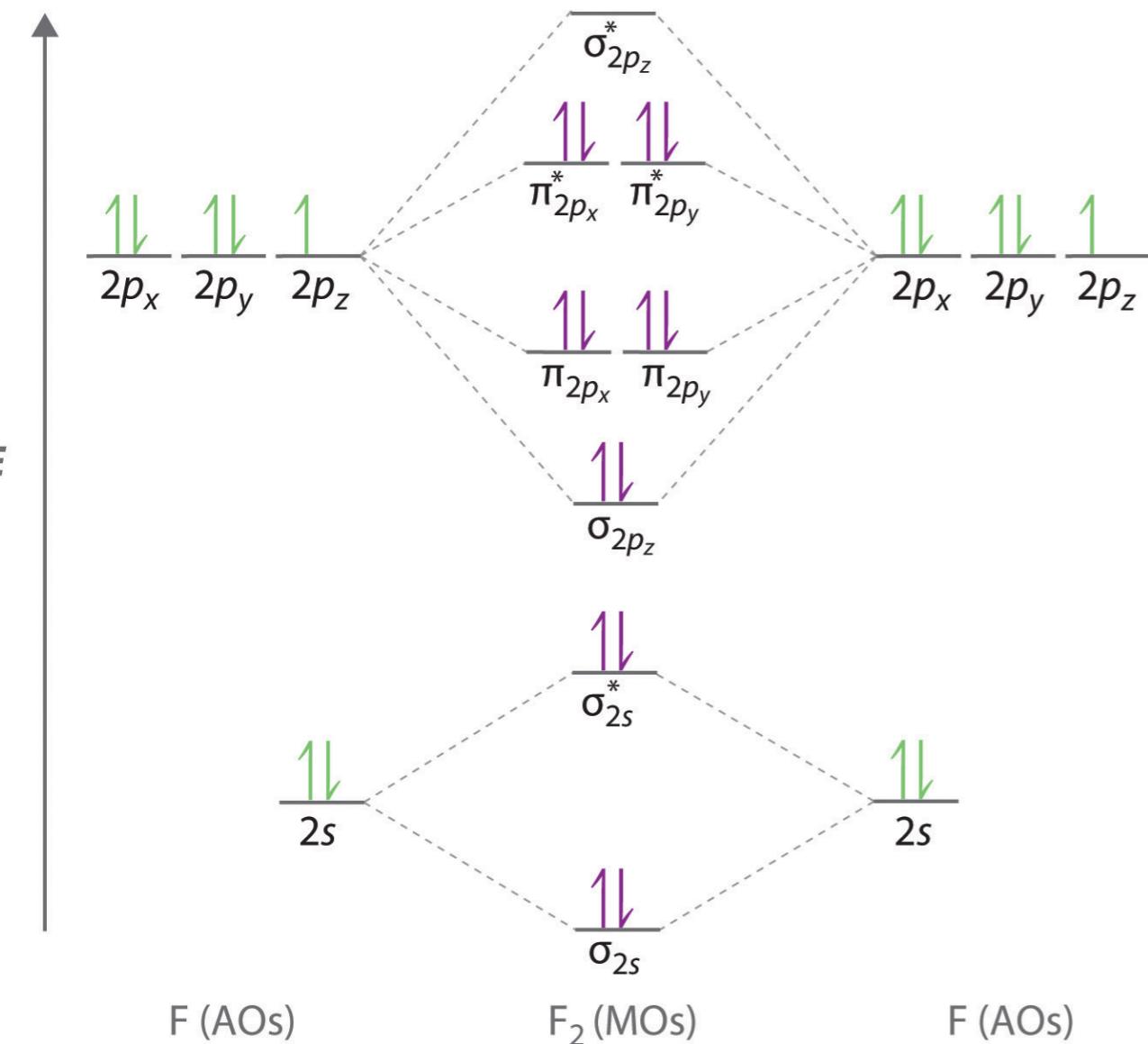


Li₂-N₂

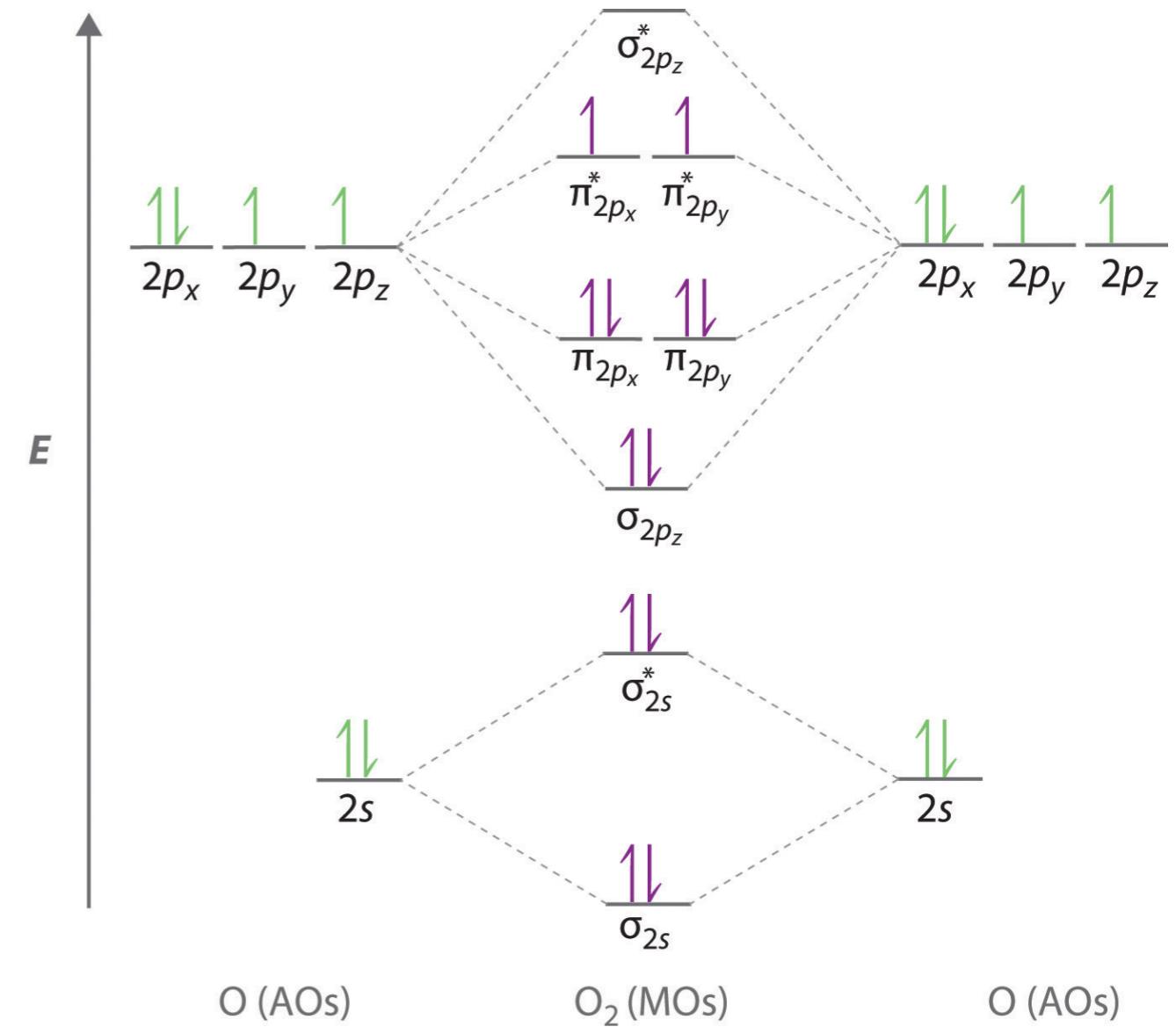


O₂-F₂

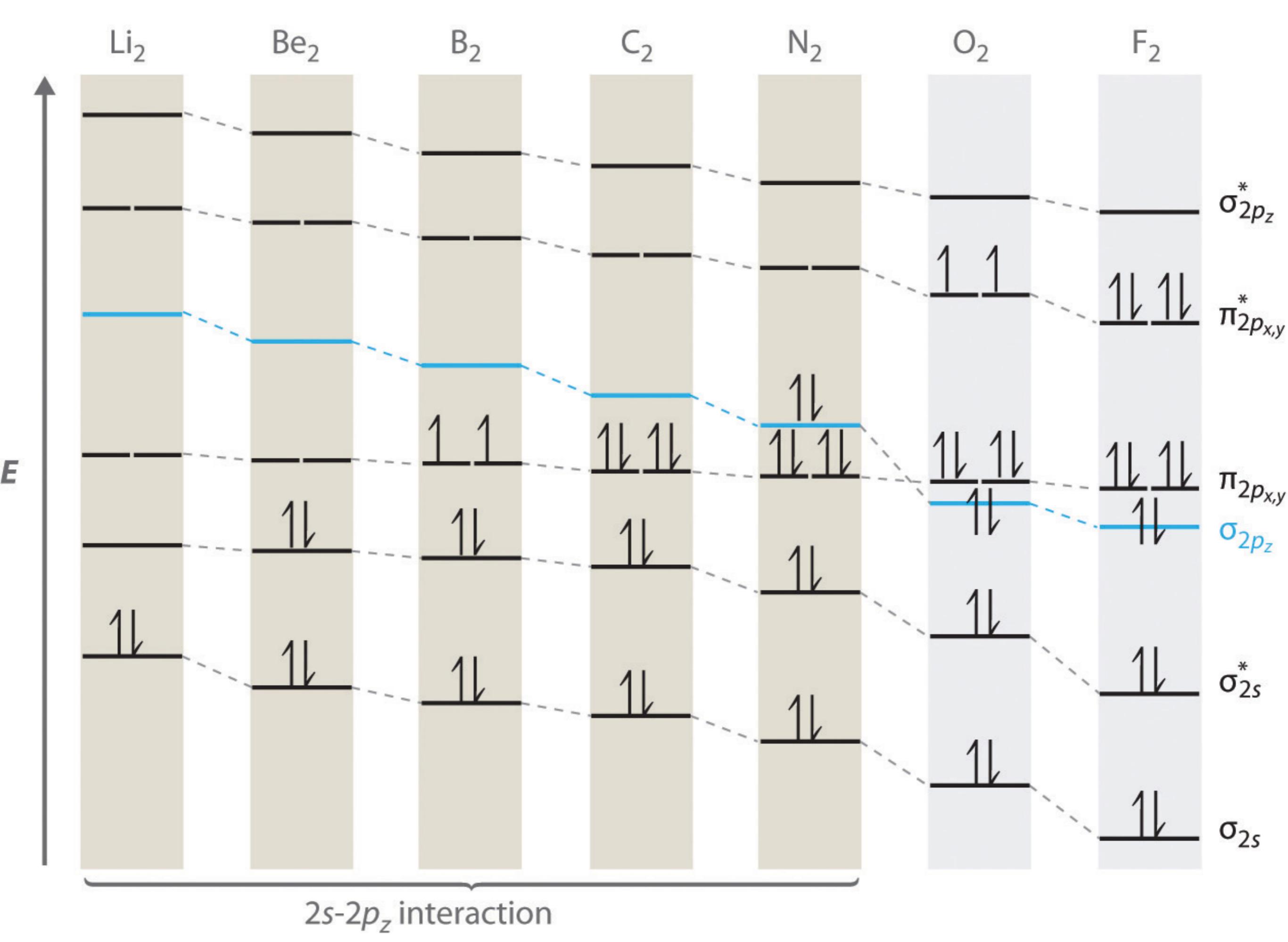




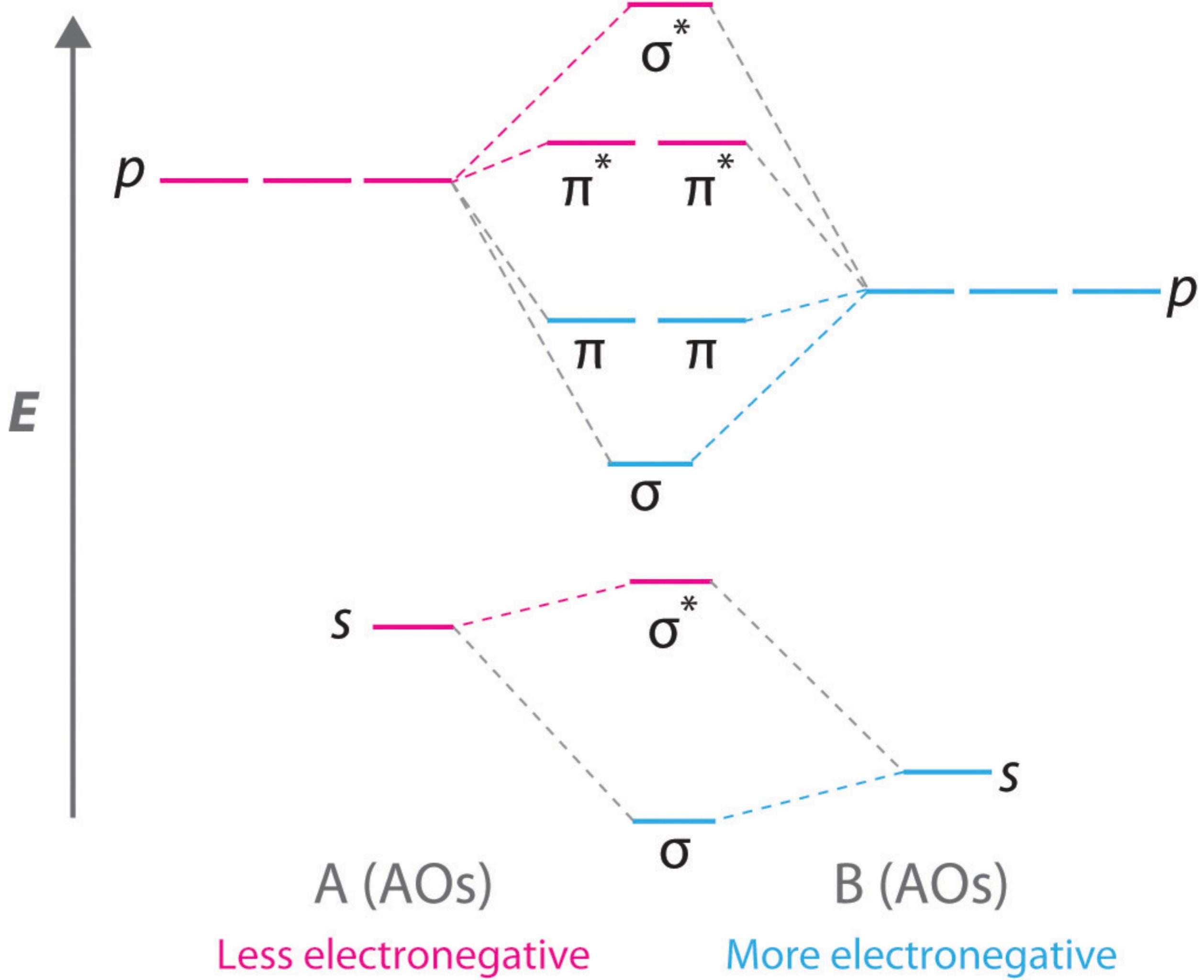
(a)

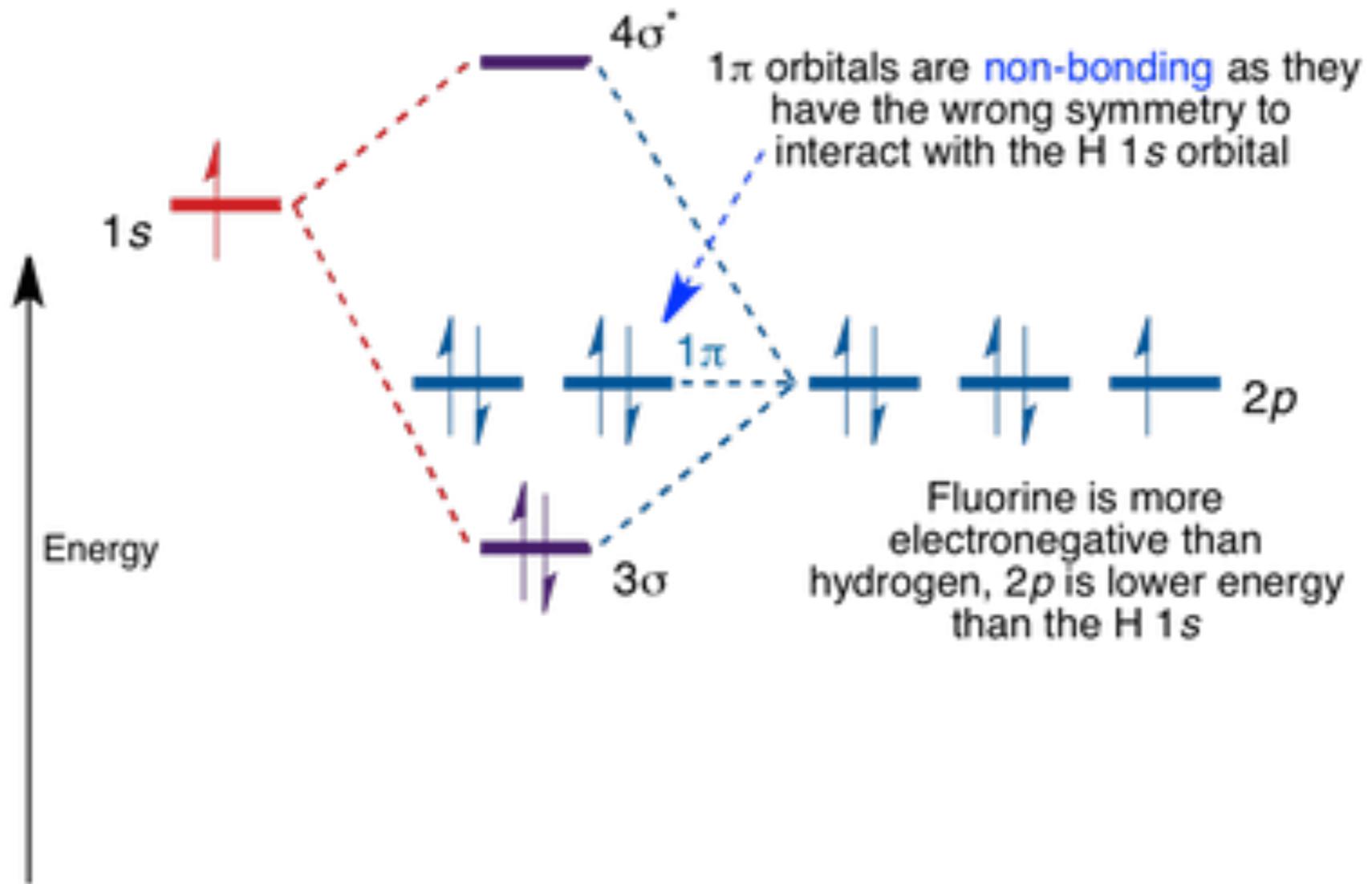


(b)



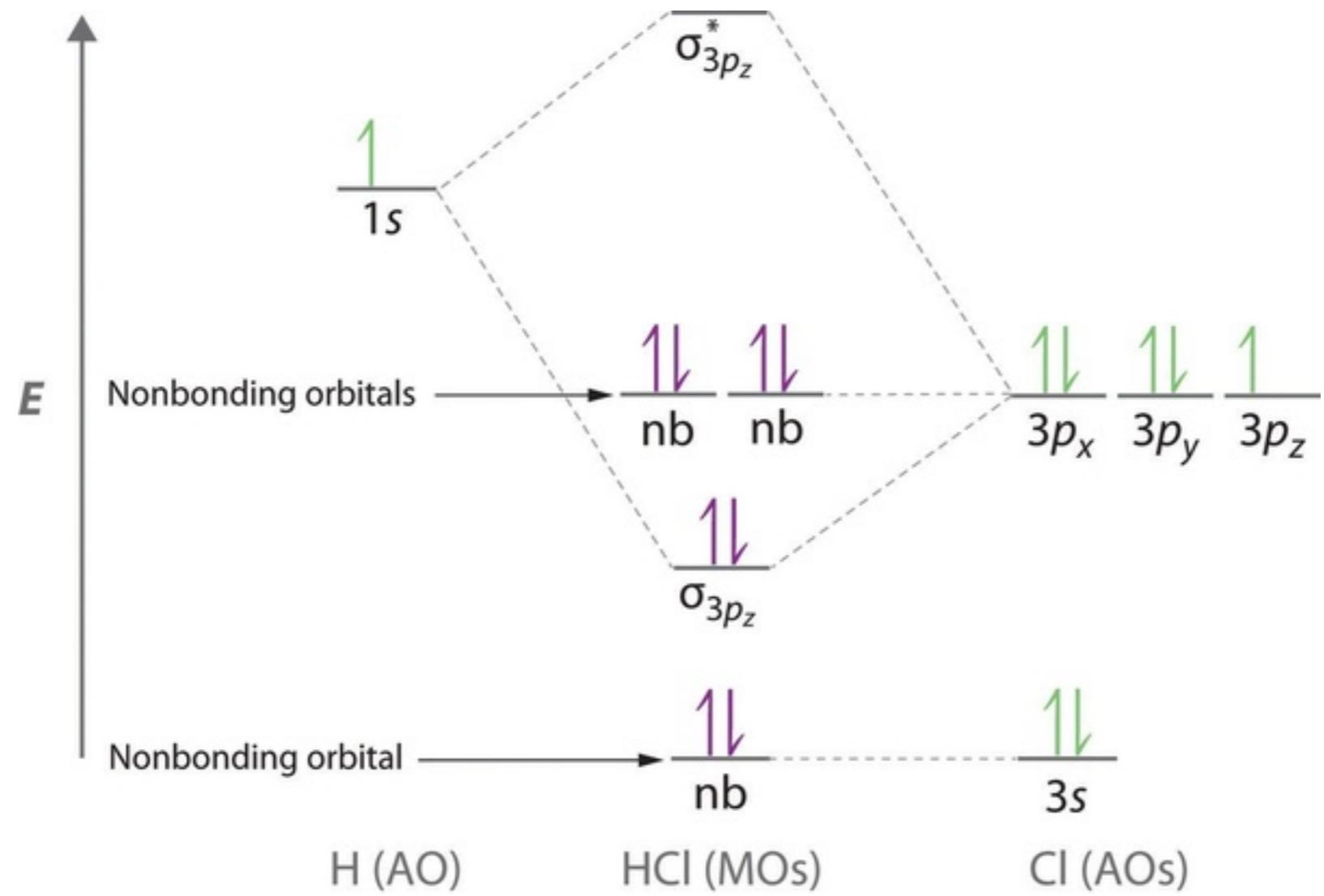
https://www.youtube.com/watch?v=57gUKxpcT_g&t=29s

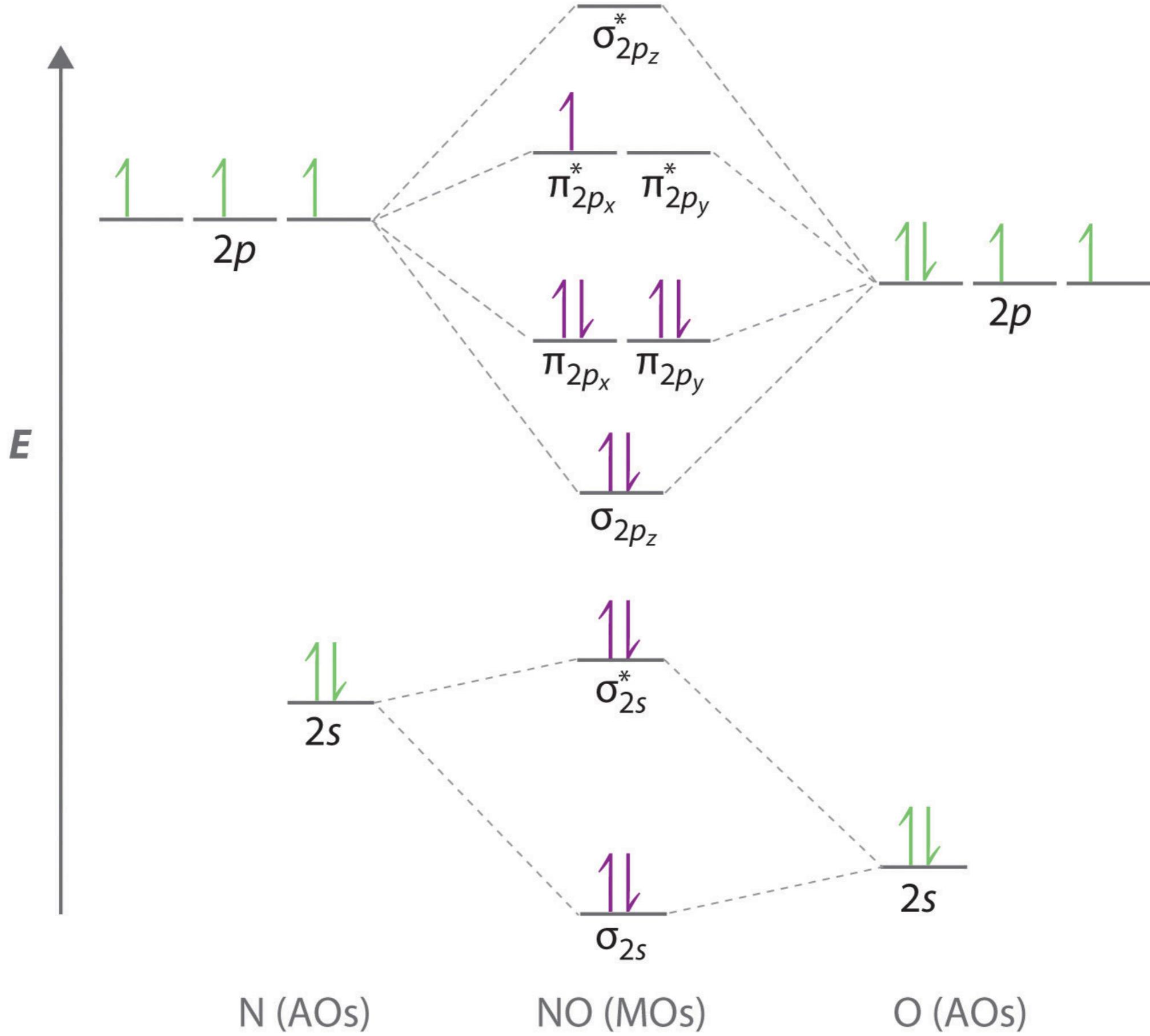


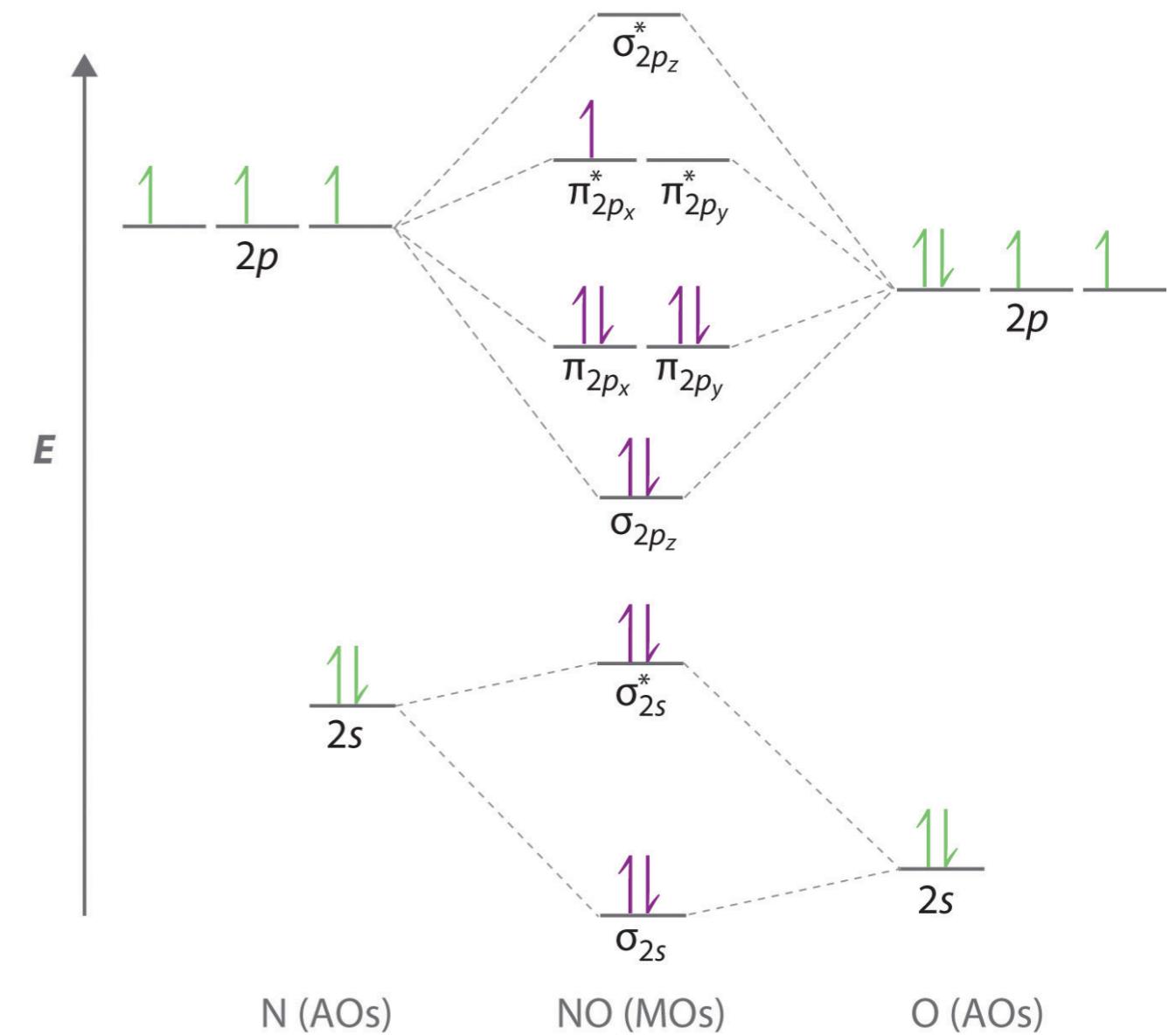
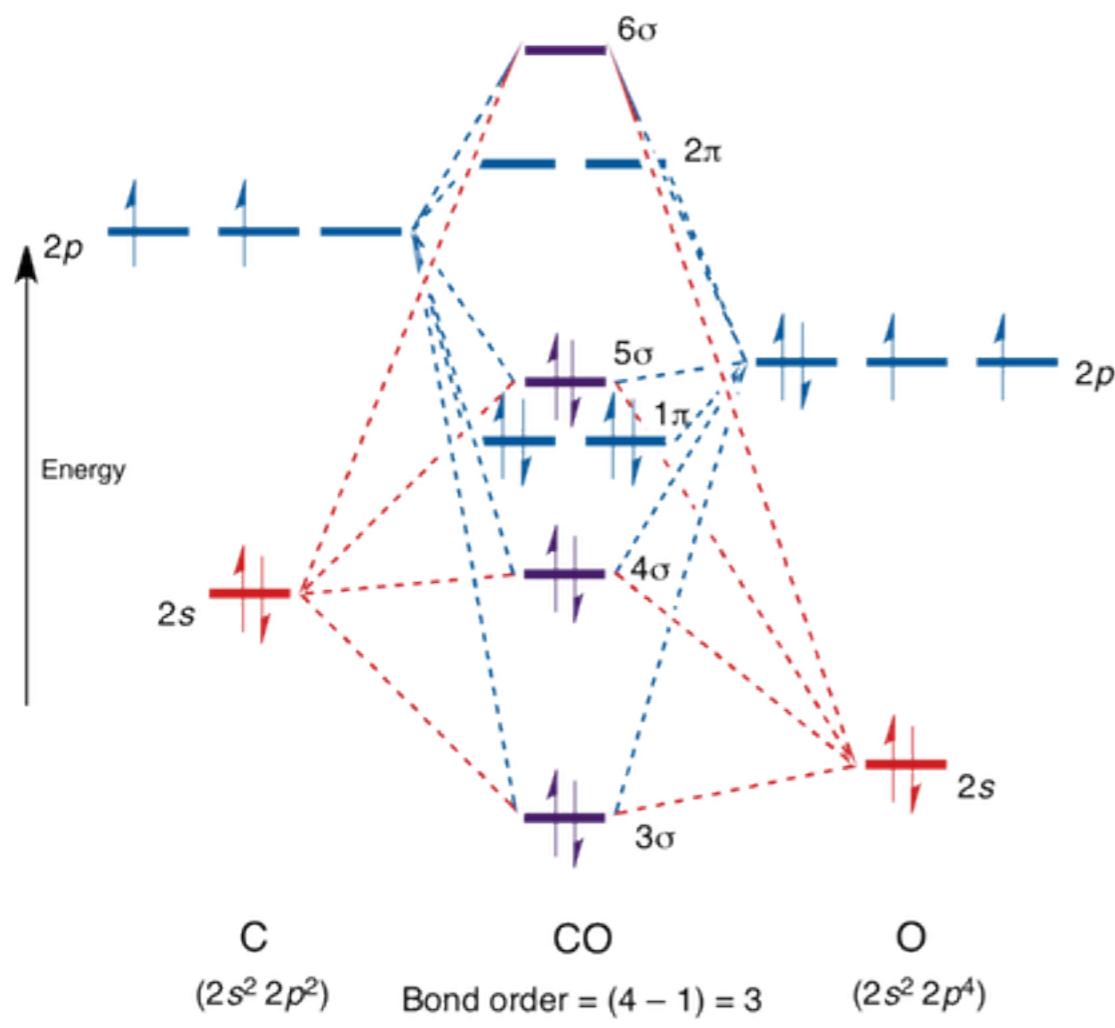


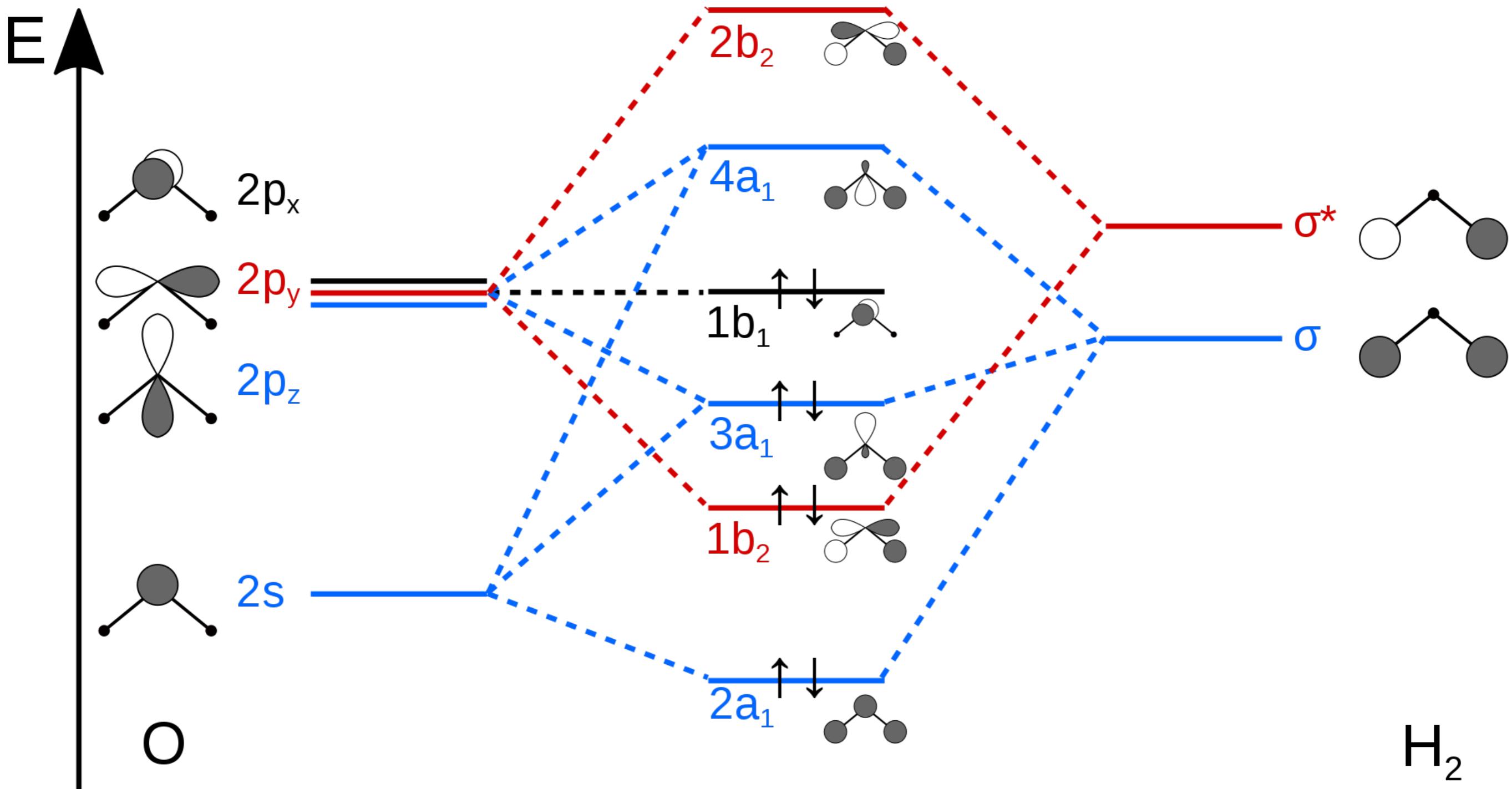
The 2σ orbital is non-bonding because the H $1s$ and F $2s$ orbitals are too far apart in energy to interact

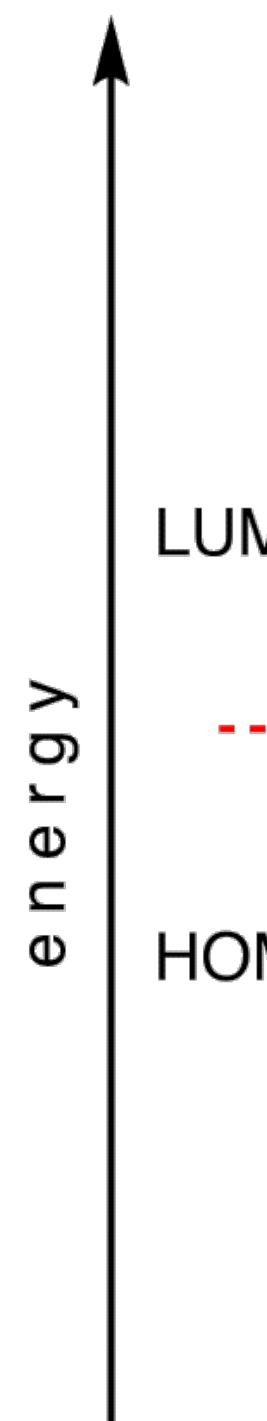
Bond order = 1











the π molecular orbitals for benzene. The dashed line represents the energy of an isolated p orbital – all orbitals below this line are bonding, all above it are antibonding. Benzene has six electrons in its π system so all the bonding MOs are fully occupied