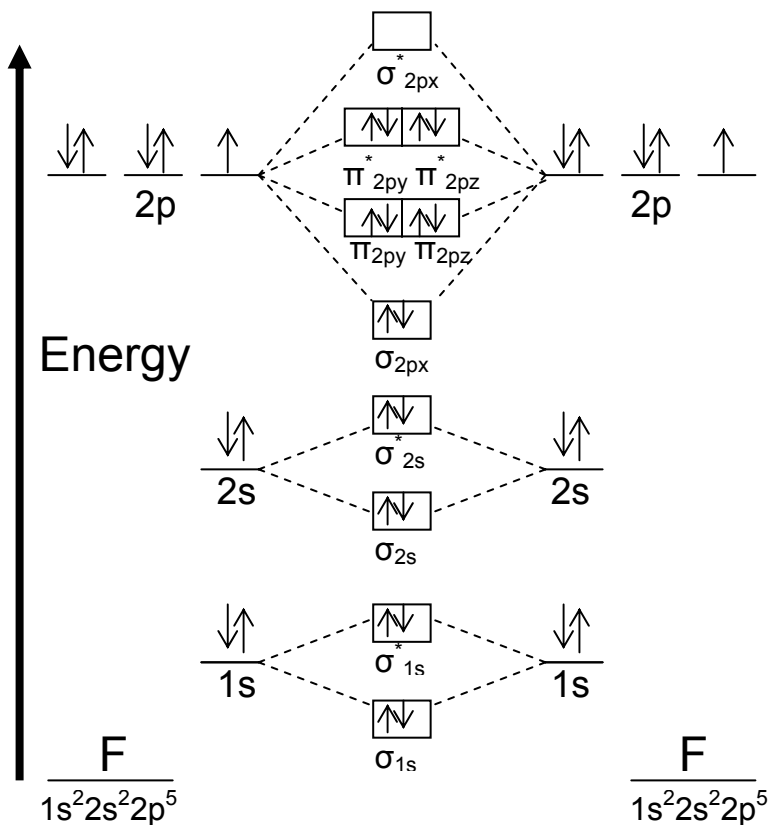


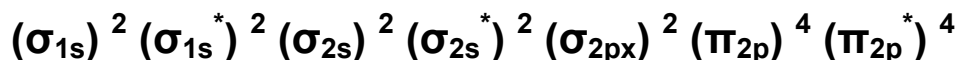
These problems are for practice in drawing your molecular orbital diagrams, molecular electron configurations and determining bond order.

The following questions pertain to the F_2 molecule:

- A) Draw the molecular orbital energy diagram for this molecule. Label all of the orbitals specifically.



- B) Give the molecular electron configuration for the molecule:



- C) Determine the bond order for the molecule:

$$\text{Bond Order} = (10 - 8) / 2 = 1$$

- D) Indicate whether the species is paramagnetic or diamagnetic:

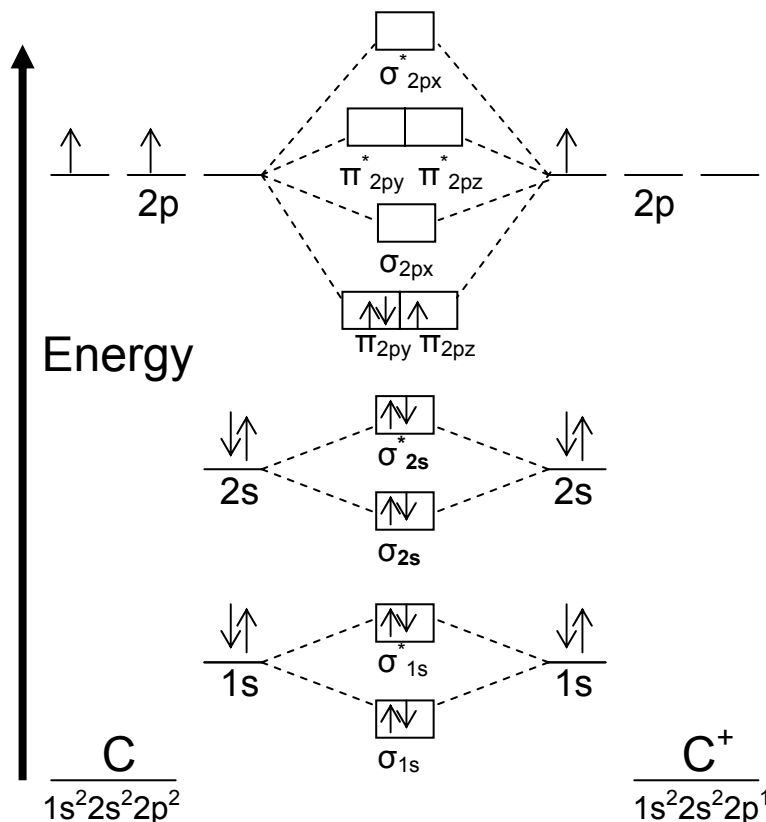
Diamagnetic: No unpaired electrons

- F) Compare the relative stability of this molecule to F_2^+ and F_2^- :

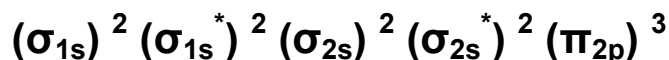


The following questions pertain to the C_2^+ ion:

- A) Draw the molecular orbital energy diagram for this ion. Label all of the orbitals specifically.



- B) Give the molecular electron configuration for the ion:



- C) Determine the bond order for the ion:

$$\text{Bond Order} = (7 - 4) / 2 = 1.5$$

- D) Indicate whether the species is paramagnetic or diamagnetic:

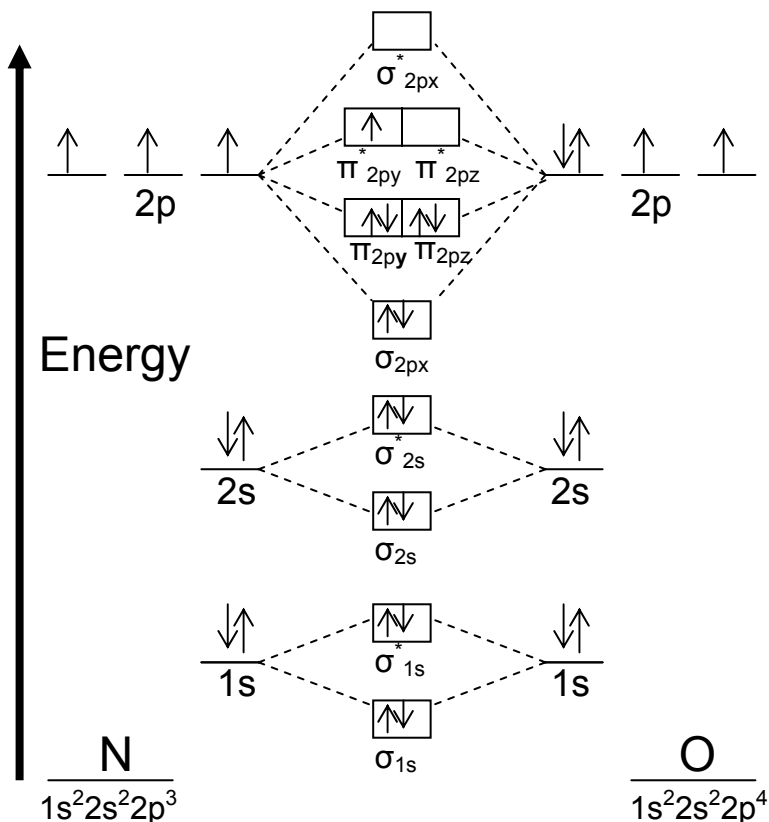
Paramagnetic: one unpaired electron

- F) Compare the relative stability of this molecule to C_2 and C_2^- :

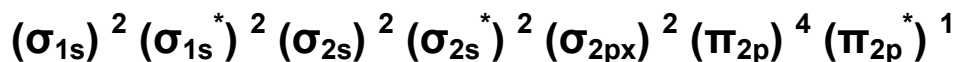


The following questions pertain to the NO molecule:

- A) Draw the molecular orbital energy diagram for this molecule. Label all of the orbitals specifically.



- B) Give the molecular electron configuration for the molecule:



- C) Determine the bond order for the molecule:

$$\text{Bond Order} = (10 - 5) / 2 = 2.5$$

- D) Indicate whether the species is paramagnetic or diamagnetic:

Paramagnetic: One unpaired electron

- F) Compare the relative stability of this molecule to NO^+ and NO^- :

