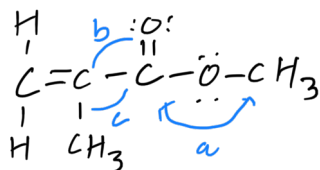
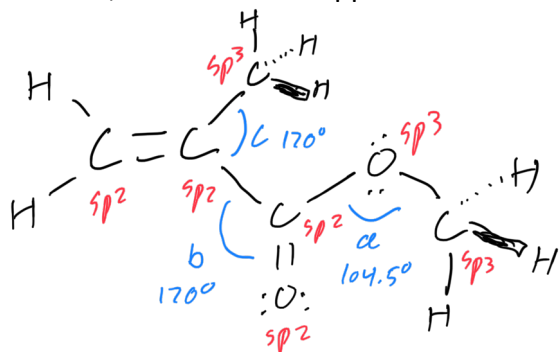


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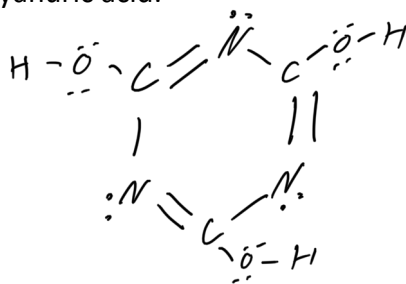
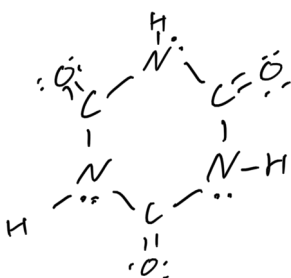
Methyl methacrylate has this Lewis structure:



Draw the 3-D structure for the molecule and indicate the hybridization at each non-hydrogen atom. Also, determine the approximate values of the bond angles noted on the Lewis structure



These are two Lewis structures for cyanuric acid:



What is the hybridization of each non-hydrogen atom in each of these structures?

Left

All C sp^2

All O sp^2

All N sp^3

Right

All C sp^2

All O sp^3

All N sp^2

Using the table of bond dissociation energies from class, which structure is more stable?

Left

6 C-N 6×305

3 C=O 3×745

3 N-H 3×391

5238 kJ/mol
to break all bonds
More stable

Right

3 C=N 3×615

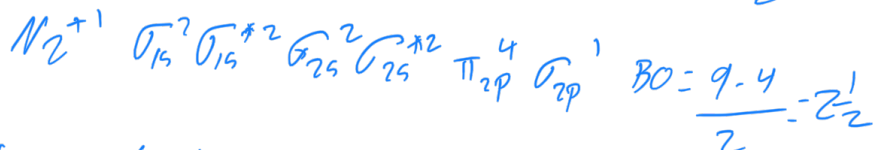
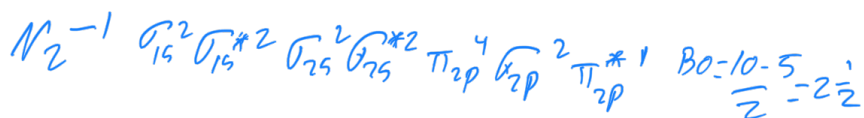
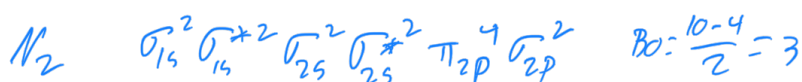
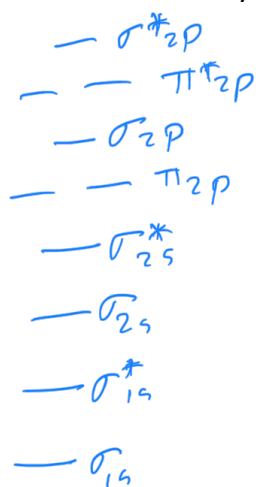
3 C-N 3×305

3 C-O 3×358

3 O-H 3×463

5223 kJ/mol
to break all bonds
Less stable

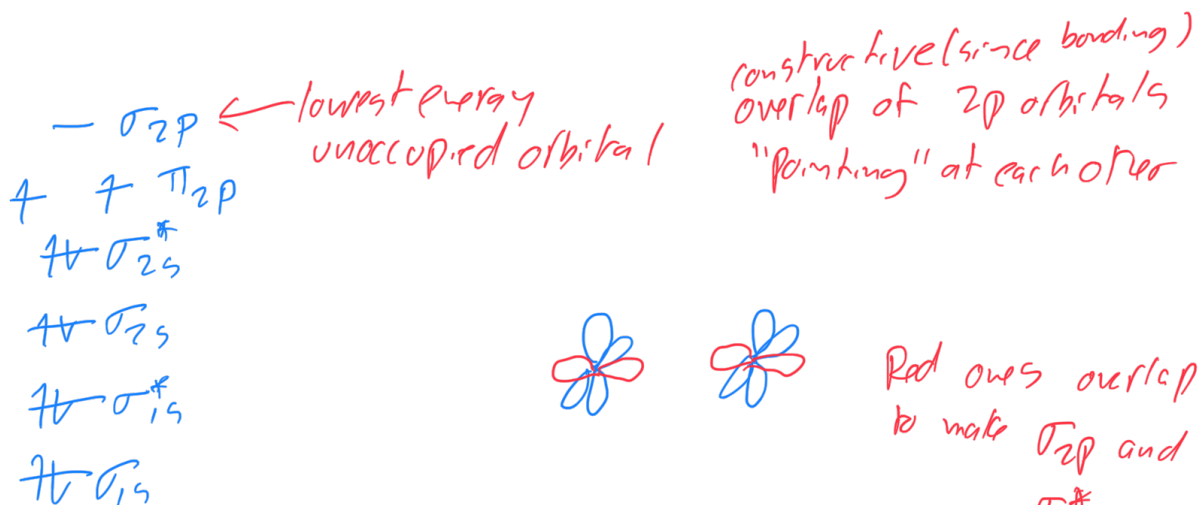
Using molecular orbital theory, write the electron configuration for N_2 as well as for the N_2^{-1} anion and the N_2^{+1} cation. Which of these three molecules has the strongest bond and which has the weakest? Justify your answer. Also, which of these three molecules is paramagnetic?



N_2 strongest, diamagnetic

N_2^{-1}, N_2^{+1} equal and both paramagnetic

For the B_2 molecule describe the lowest energy molecular orbital that does **not** have electrons in it. Describe this orbital both in words and by making a drawing that shows the molecular orbital as well as the atomic orbitals from which it is derived



Red ones overlap to make σ_{2p} and σ_{2p}^*

