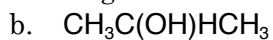
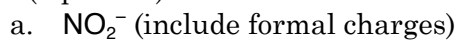


1. (6 pts. ea.) Draw Lewis structures for the following molecules



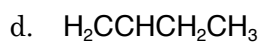
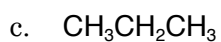
1. _____

2. _____

3. _____

4. _____

5. _____



6. _____

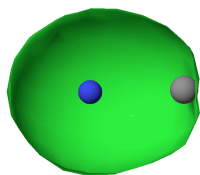
7. _____

8. _____

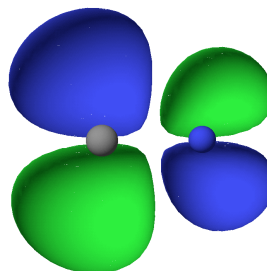
9. _____

2. (4 pts. ea.) Determine (a) the symmetry of the following orbitals (σ or π) and (b) whether the orbitals are bonding or antibonding.

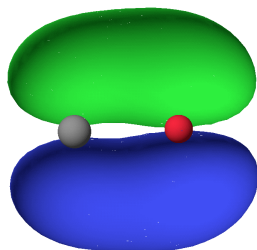
i.



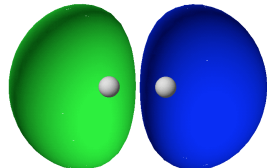
ii.



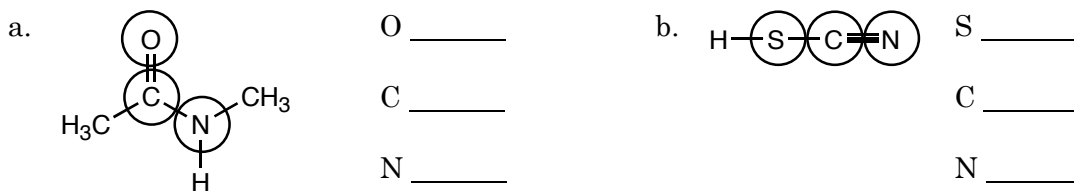
iii.



iv.



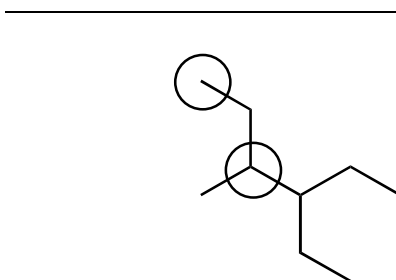
3. (12 pts.) Determine the hybridization of each of the circled atoms.



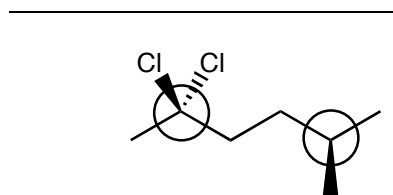
4. a. (8 pts.) Determine the IUPAC name for each of the following molecules

b. (8 pts.) Determine whether the circled C atoms are 1°, 2°, or 3°.

i.

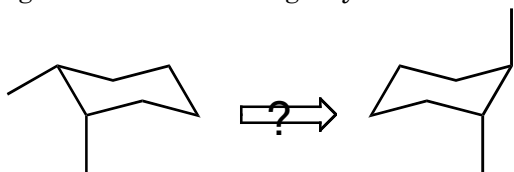


ii.

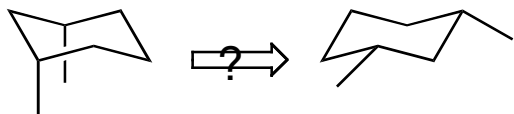


5. (8 pts.) Can the dimethylcyclohexane on the left be converted to the dimethylcyclohexane on the right without breaking any bonds?

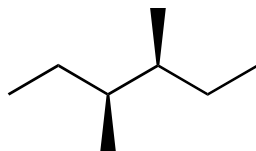
a.



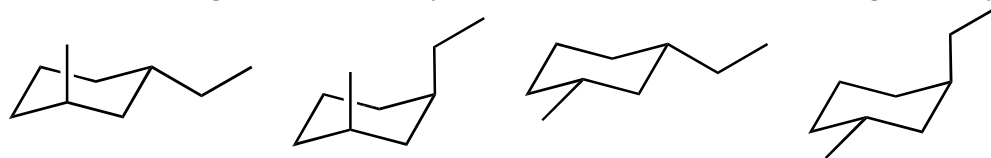
b.



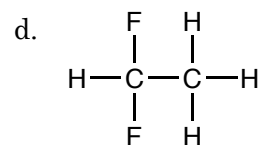
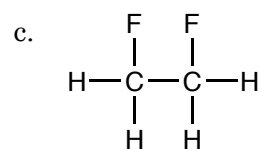
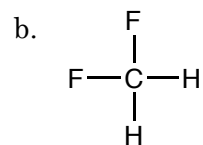
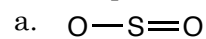
6. (6 pts.) Draw a Newman projection down the C₃ to C₄ bond of the 3,4-dimethylhexane drawn below.



7. (8 pts.) Order the following disubstituted cyclohexanes in order of increasing stability.



8. a. (3 pts. ea.) Draw three dimensional representations (wedge and dash structures) for the following molecules, (b. 2 pts. ea.) indicate the presence of polar bonds using the δ^+ and δ^- notation, and (c. 2 pts. ea.) determine which, if any, of the molecules is polar. Kekulé structures are provided.



9. (10 pts.) Draw Newman projections for the lowest and highest energy structures of 1,1-dichloropropane.