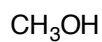
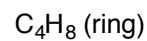
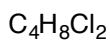


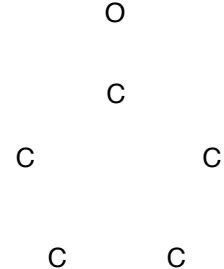
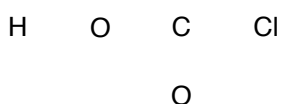
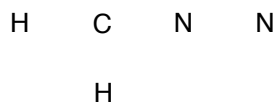
Chemistry 233
Chapter 1 Problem Set

1) Draw a valid Lewis structure for each compound below.

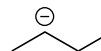
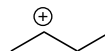
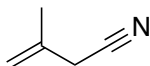
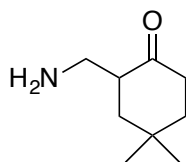


Note: B will not have a full octet.

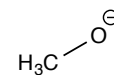
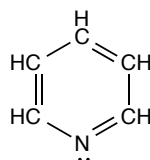
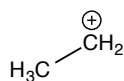
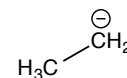
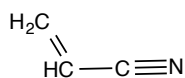
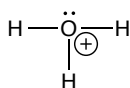
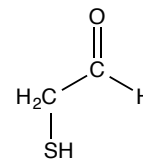
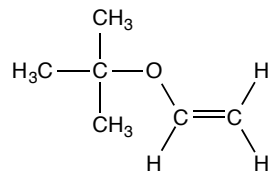
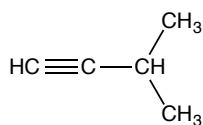
2) Draw a valid Lewis structure for each compound below. Assume the atoms are arranged as shown.



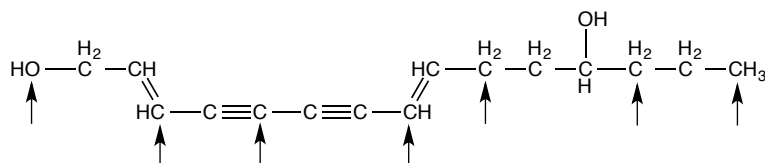
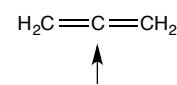
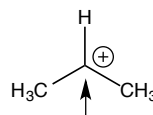
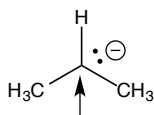
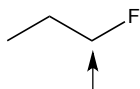
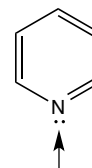
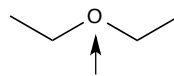
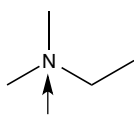
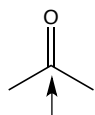
3) For each compound shown below, determine the number of hydrogen present on each carbon atom.



4) Determine the hybridization of each non-hydrogen atom in the compounds below.

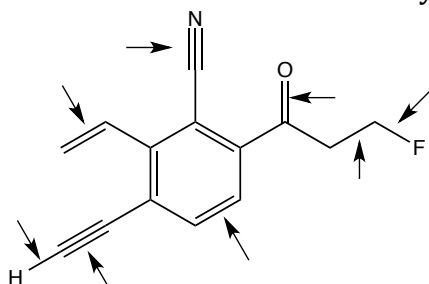


5) Predict the electron geometry around each indicated atom below.

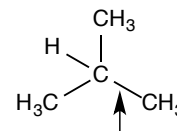
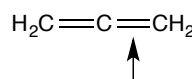
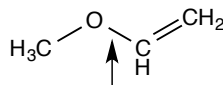
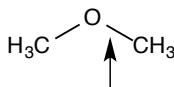
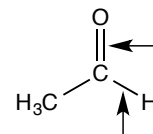
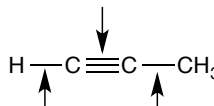
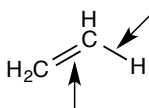
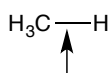


enanthotoxin:
a poison isolated from hemlock

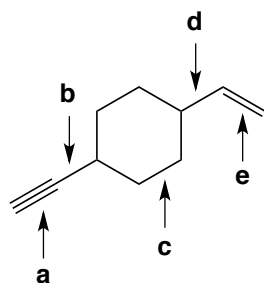
6) Classify each bond using σ and π . List the number of each bond type (i.e. 1 σ & 2 π bonds).



- 7) For each bond indicated in the structures below, determine the orbitals that make up that particular bond.



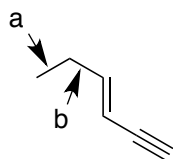
- 8) Consider the molecule shown below:



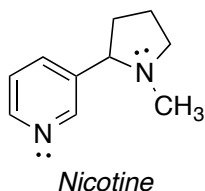
- a. Rank the indicated bonds in order of increasing bond length.

- b. Rank the indicated bonds in order of increasing bond strength.

- 9) Answer the following questions about each molecule shown below.



1. Label the shortest bond.
2. Label the shortest C-C single bond.
3. Label the weakest C-C bond.
4. Label the strongest bond
5. Label the strongest C-H bond
6. Explain why bond **a** and bond **b** are different lengths.

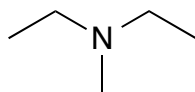
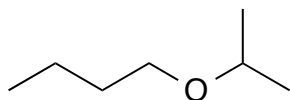
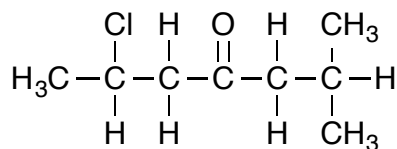
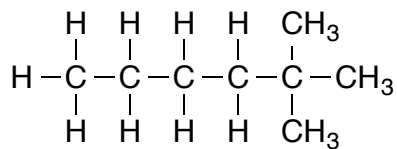


1. What is the hybridization of each N atom?
2. What is the geometry around each N atom?
3. In what type of orbital does the lone pair in each N reside?

10) Convert each condensed structure below to a Kekule structure and a skeletal structure.

| Condensed | Kekule | Skeletal |
|--|--------|----------|
| $(\text{CH}_3)_2\text{CH}(\text{CH}_2)_2\text{OH}$ | | |
| $\text{CH}_3(\text{CH}_2)_3\text{CH}(\text{Cl})\text{CH}_3$ | | |
| $(\text{CH}_3)_3\text{CCH}_2\text{C}(\text{CH}_3)_2\text{CH}_2\text{Br}$ | | |
| $\text{BrCH}_2\text{OCH}_2\text{CO}_2\text{H}$ | | |
| $\text{H}_2\text{NCH}_2\text{N}(\text{CH}_3)\text{CH}_2\text{Br}$ | | |
| $\text{CH}_3(\text{CH}_2)_3\text{CCl}(\text{CH}_3)_2$ | | |

11) Convert each structure below to a fully condensed structure.



12) Draw each of the following as skeletal structures.

