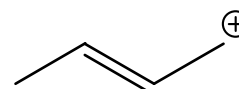
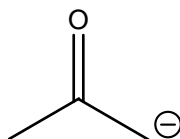
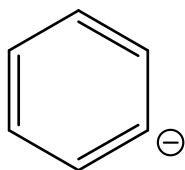


Discussion Problem Set 2
Structure, Hybridization, polarity, Acid/base pKa

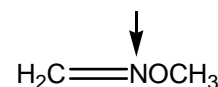
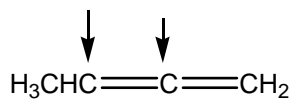
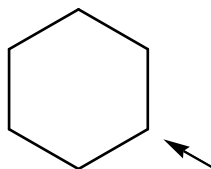
1. Draw the appropriate structures (problem 1.24):

Lewis Structure	Condensed structure	Skeletal structure
$ \begin{array}{ccccccc} & & \text{H} & \text{H} & \text{:O:} & & \text{H} \\ & & & & & & \\ \text{H}_3\text{C} & - & \text{C} = & \text{C} - & \text{C} - & \text{O} - & \text{C} - \text{CH}_3 \\ & & & & & & \\ & & \text{CH}_3 & & & & \text{H} \\ & & & & & & \\ & & & & & & \text{H} \end{array} $		

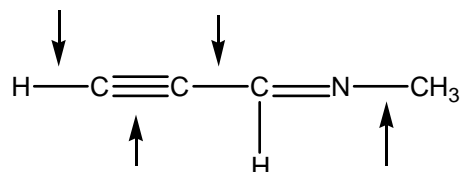
2. Draw in all the hydrogens and non-bonded electrons in each ion. (problem 1.61)



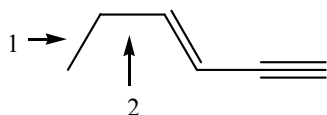
3. Predict the hybridization and geometry around each indicated atom (problem 1.63)



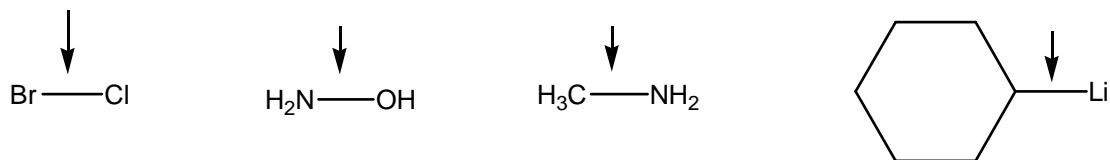
4. What orbitals are used to form each indicated bond? For multiple bonds, indicate the orbitals used in individual bonds. (problem 1.64d)



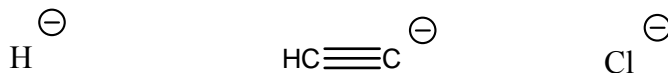
5. In the figure below, mark the shortest C-C single bond, the strongest C-H bond, and explain why bond (1) and bond (2) are different lengths (problem 1.70)



6. Use the partial positive and partial negative symbols to indicate the polarity of the labeled bonds. (problem 1.73)



7. Circle all the bases that are strong enough to deprotonate CH_3COOH (problem 2.12).



List four bases that are strong enough to deprotonate $\text{HC}\equiv\text{CH}$.

8. Draw the products of each acid/base reaction. Based on pKa values, predict in which direction the equilibrium lies (Problem 2.37).

