

## Problem Set Chapter 1

Name \_\_\_\_\_

**DUE: Wednesday September 6**

1. What is the charge on a carbon atom that has the same number of valence electrons as a neutral oxygen atom? Draw its *complete* Lewis dot structure.

2. Which of the following bonds places the most partial *negative* charge on the carbon atom?

A. C-B

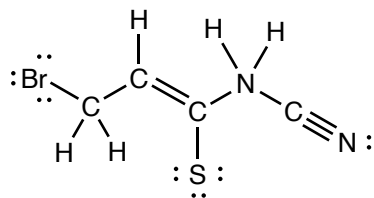
B. C-N

C. C-O

D. C-F

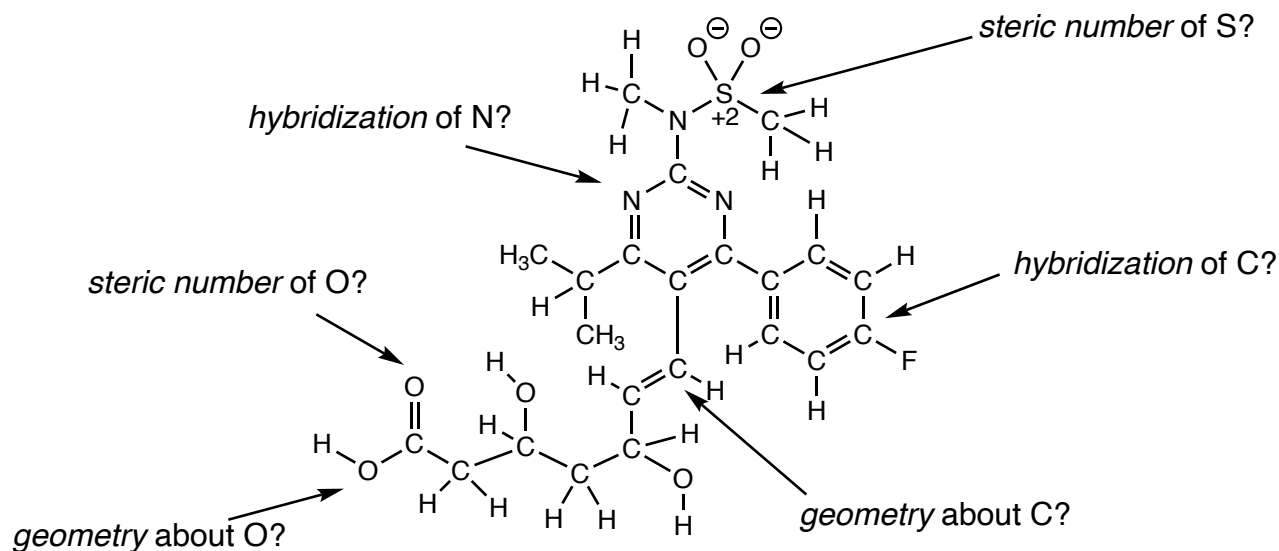
3. Draw the *complete* Lewis dot structure for methoxide ion:  $[\text{H}_3\text{CO}]^{-1}$

4. The structure below has all atoms and lone pairs drawn. Assign any *formal* charges and the overall charge for the molecule:



5. What molecule containing only 1 carbon atom and an appropriate number of hydrogen atoms has a **negative** charge and a **tetrahedral** geometry?

6. Crestor is a medication launched in 2003 by AstraZeneca to treat high cholesterol. Fill in the desired information for Crestor's chemical structure as indicated below:

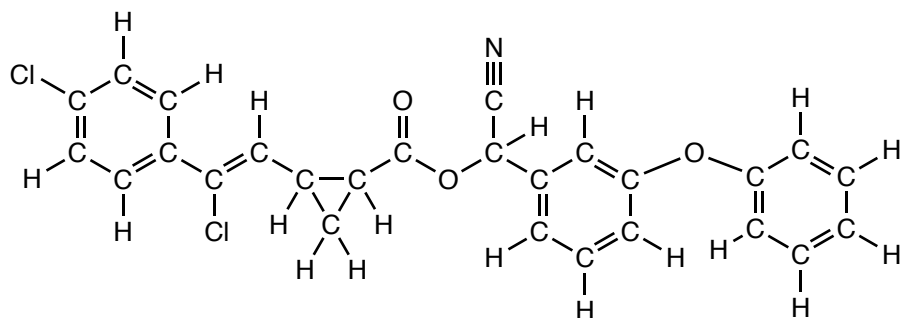


7. How many sigma bonds in Crestor are formed via overlap of an  $SP^2$  hybridized orbital of one atom with an  $SP^3$  hybridized orbital of another?

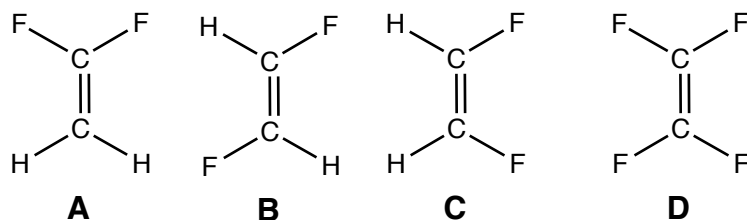
8. Flumethrin, shown below, is one of the compounds used as a flea and tick treatment on dogs.

**i. How many atoms have  $SP^2$  hybridization?**

**ii. How many atoms have  $SP$  hybridization?**



9. Draw the individual bond dipoles and overall dipole moments for the compounds below, or designate them as nonpolar.



10. After solving problem 9, Jimmy is confident that compound E will have a greater dipole moment than compound F. Is Jimmy correct? Briefly explain your findings (BIG HINT: use the CheMagic program to view the two isomeric compounds)



**Jimmy**

