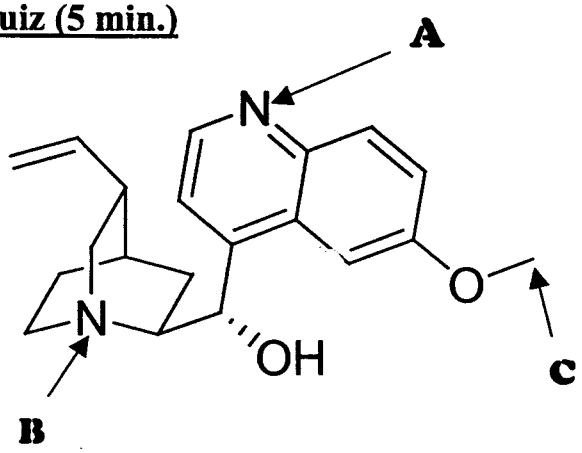
Chem 30A- Week 3

Warm-up: speed quiz (5 min.)



quinine

The structure above is quinine- an anti-malarial agent.

a. What is the **total** number of hydrogens?
b. What does the dash represent?
c. What is the hybridization of the atom labeled **A**?
d. How many lone pair electrons on the atom labeled **B**?
e. What is the name of the group labeled **C**?
f. Draw any possible resonance structures.

Discussion Questions

1. A *carbocation* is a trivalent carbon with a positive charge.

Draw the structure of a carbocation. Justify your structure.

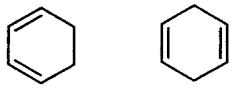
What is the hybridization of the carbon atom?
What geometry does the carbocation have?
What relationship do you see between a cabocation and BF_3?

Chapter 2

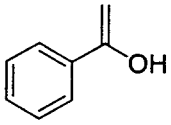
2. What is the hybridization for each carbon atom?

   a. propane
   b. 1-butyene-3-yne
   c. 2-methylpropene
   d. dimethyl ether
   e. cyclobutene

3. What is the relationship of the below compounds? Draw any resonance structures.



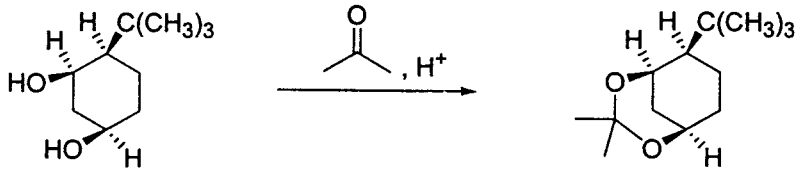
4. Draw all possible resonance structures. Identify the most stable and explain why.



5. Why the staggered conformation of 2, 3- dimethyl butane is preferred. (focus on C2 and C3). Use molecular orbitals as part of your answer.

6. Decalin is two fused cyclohexane rings. Decalin can have a *cis* and a *trans* conformation- referring to the bridgehead carbons. Draw both *cis* and *trans* decalin. Which is more stable?

7. What conformation must 4-*tert*-butyl-cyclohexane-1,3-diol be in to readily react with acetone and an acid catalyst to form an acetal?



4-tert-butyl-cyclohexane-1,3-diol