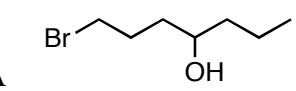
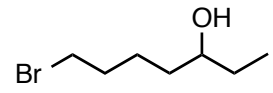
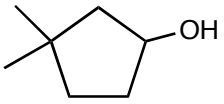
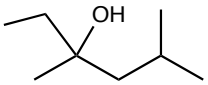
Chapter 13 Practice Problems

1. Provide the IUPAC name for the following alcohols:

A 

B 

C 

D 

2. Arrange the following molecules according to their expected boiling points from highest to lowes:

A. n-Butanol
B. Methanol
C. Isopropanol
D. 2-Pentanol
E. 2-Butanol
F. *tert*-Butanol

3. Methanol, ethanol and both n-propanol and isopropanol are completely soluble in water (any proportions).

A. Why are these alcohols so soluble in water?

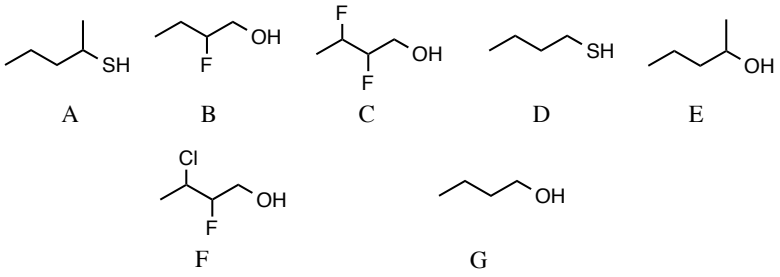
B. n-butanol is only partially soluble in water. Provide an explanation for this observation.

C. Unlike n-butanol, its isomer *tert*-butanol is completely soluble in water. Provide an explanation for this observation.

4. Alcohols can hydrogen bond to themselves effectively. Draw the partial charges on the O and H atoms of a molecule of methanol (as a simple representative alcohol) that result from bond polarity. Then draw the interaction that takes place during hydrogen bonding between two different methanol molecules.

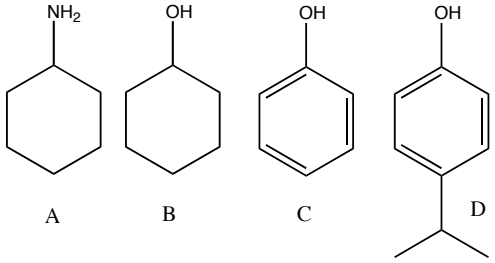
5. Because of the large partial positive charge on the hydrogen of the OH group of an alcohol, the OH group will hydrogen bond to any atom with a lone pair of electrons. Draw the hydrogen bonding interaction that is expected to take place between methanol and acetone.

6. Rank the following compounds according to their expected acidities (most acidic >>> least acidic):



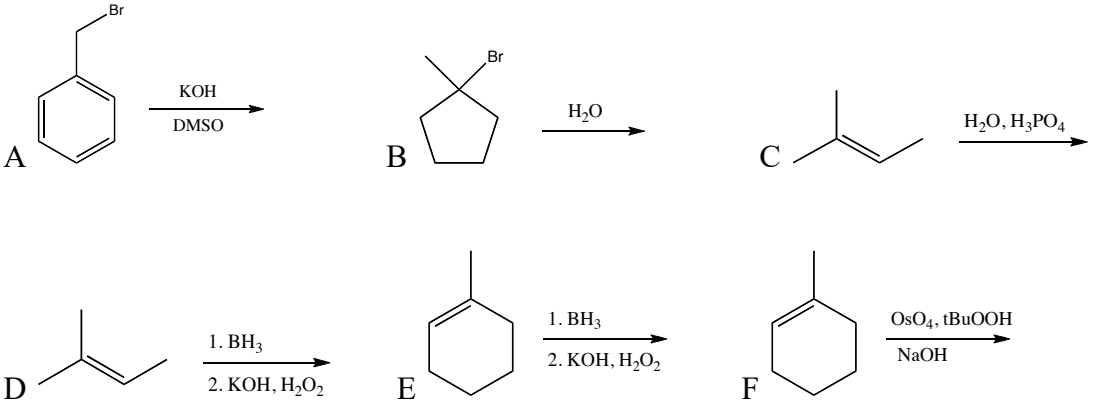
A B C D E F G

7. Rank the following compounds according to their expected acidities (most acidic >>> least acidic):

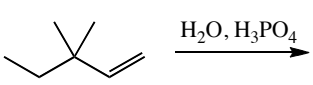


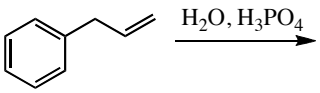
A B C D

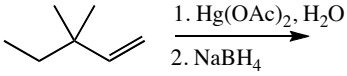
8. Draw the expected product from the following reactions (include stereochemistry where relevant):

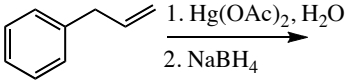


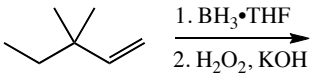
9. Draw the reaction products resulting from the following *contrasting* alkene hydration reaction conditions:

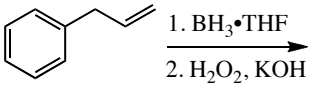






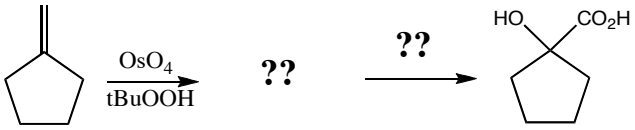




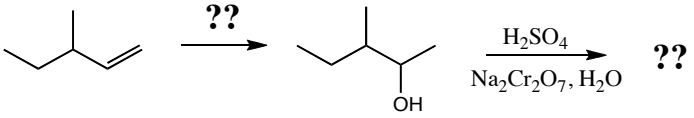


10. For each of the following, provide the reagent or product as necessary:

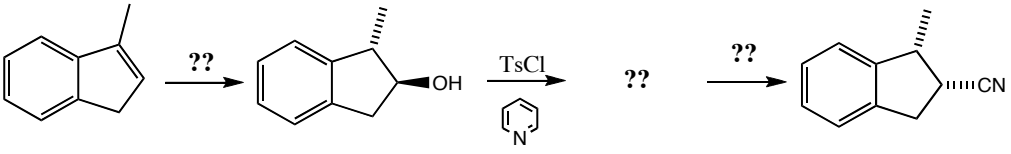
A.



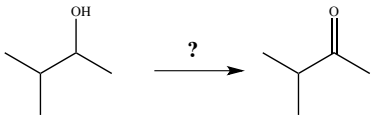
B.

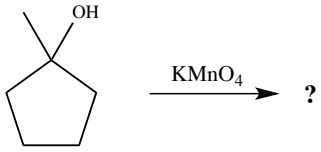


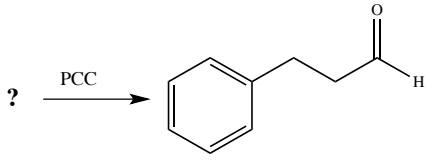
C.

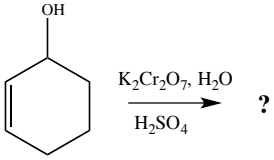


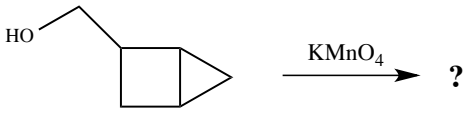
11. Provide the appropriate starting material, reagent or product for each of the following reactions:

A. 

B. 

C. 

D. 

E. 

F.