

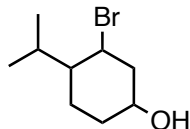
# Problem Set Chapter 13

Organic Chemistry for  
Life Sciences: CHM 224  
Section A

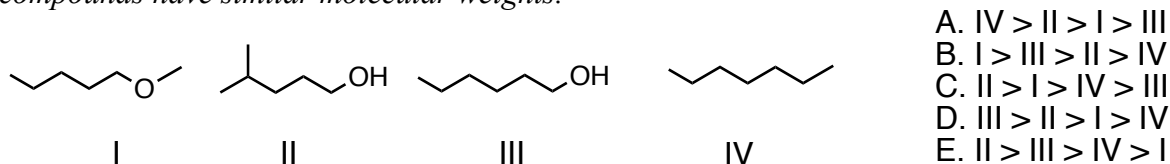
Name \_\_\_\_\_

**DUE: Wednesday, February 4th in class**

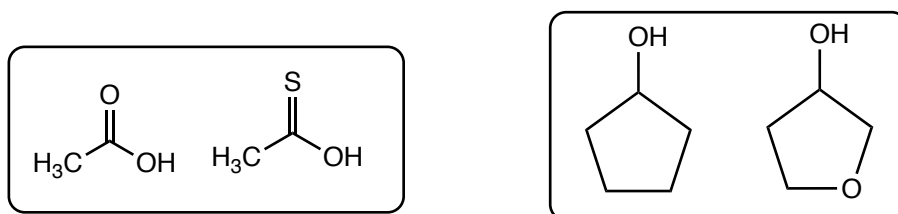
1. What is the IUPAC name of the following compound?



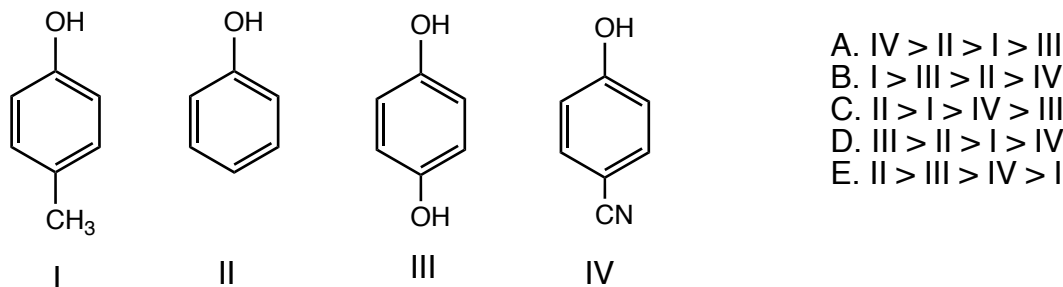
2. Which of the following properly orders the boiling points of the compounds below? *Note that all compounds have similar molecular weights.*



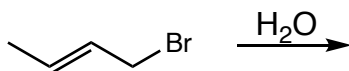
3. Circle the most acidic compound from each pair below:



4. Which of the following properly orders the expected acidities of the phenol compounds below?



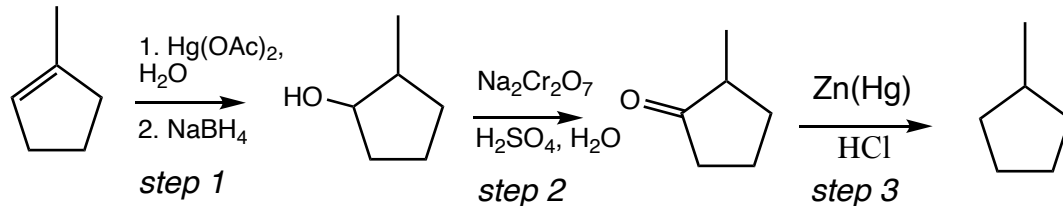
5. What are the expected products from the following S<sub>N</sub>1 reaction and which is the major product?



6. Jimmy plans a synthetic route shown below. Do you think Jimmy's route will work? Which, if any, of the reaction steps (*as individually written*) are bound to fail?

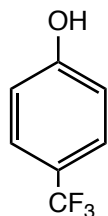


Jimmy



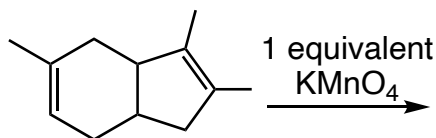
- A. all steps will work!      C. steps 2 and 3      E. step 2 only      G. sorry Jimmy, none of the steps will work!  
 B. step 1 and 2      D. step 1 only      F. step 3 only

7. The compound below has a  $pK_a = 8.7$ . The  $pK_a$  of unsubstituted phenol = 10. Which one of the following statements is true?

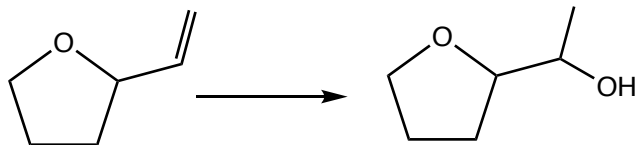


- A. The  $CF_3$  group is electron withdrawing and increases the acidity of phenol  
 B. The  $CF_3$  group is electron donating and increases the acidity of phenol  
 C. The  $CF_3$  group is electron withdrawing and decreases the acidity of phenol  
 D. The  $CF_3$  group is electron donating and decreases the acidity of phenol

8. Predict the major product from the following reaction and include stereochemistry.



9. Which set of hydration conditions is best suited to complete the following reaction?



- A. KOH, DMSO  
 B. i.  $BH_3$     ii. NaOH,  $H_2O_2$   
 C.  $H_2SO_4$ ,  $H_2O$   
 D. i.  $Hg(OAc)_2$ ,  $H_2O$     ii.  $NaBH_4$   
 E.  $H_2O$ , NaOH

10. Which alcohol(s) will fail to give a ketone or aldehyde upon reaction with  $Na_2Cr_2O_7$ ,  $H_2SO_4$ ,  $H_2O$  (may be more than one answer)?

- A. 2-methyl-2-heptanol  
 B. 3,3-dimethyl-1-hexanol  
 C. 1-methylcyclopentanol  
 D. 2-methylcyclopentanol