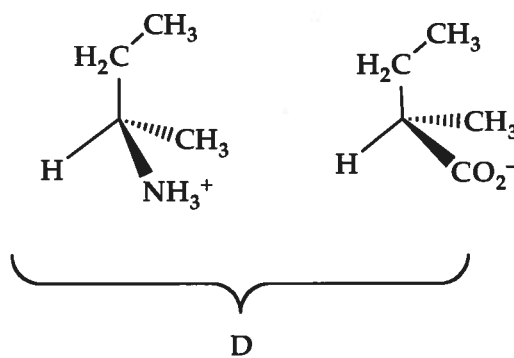
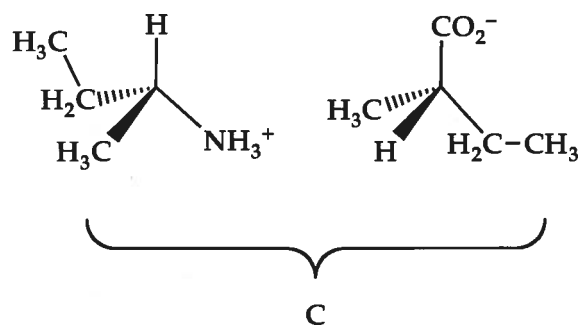
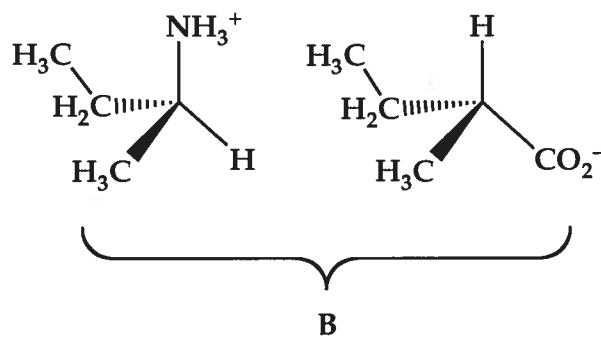
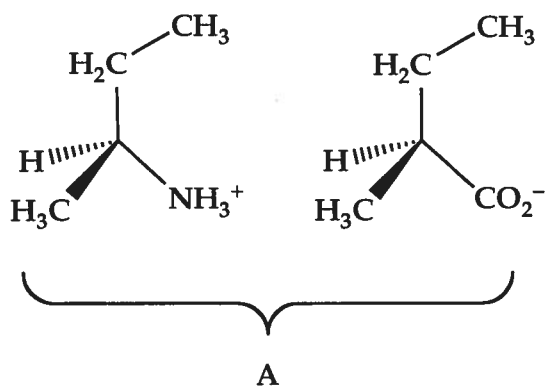


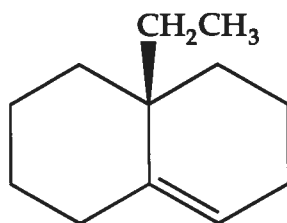
Chemistry 3311-100
 Organic Chemistry / Dr. Barney Ellison
 Final Exam: Tuesday 8, 2012 @ 4:30 pm → 7:00 pm (RAMY C250)

Name: _____ (please print)

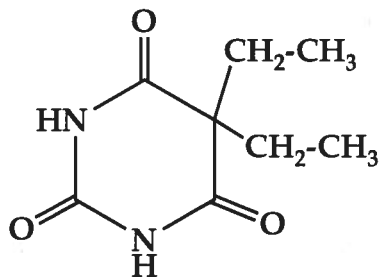
1. (10 pts) Which of the salts below should have identical solubilities in methanol? Why? (hint: work out the stereochemistry of each salt)



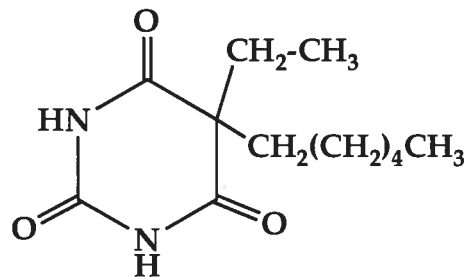
2. (10 pts) What two diastereomeric products could be formed in the hydroboration-oxidation of this alkene? Which compound would be the major product?



3. (10 pts) The effectiveness of barbiturates is directly related to their solubility in lipid bilayers of membranes. Which of the following two barbiturates would be the most potent sedative? Why?



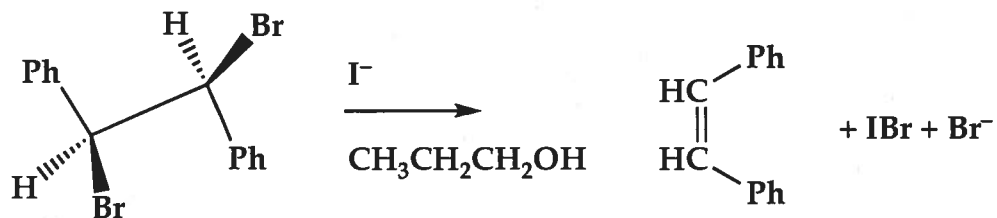
barbital



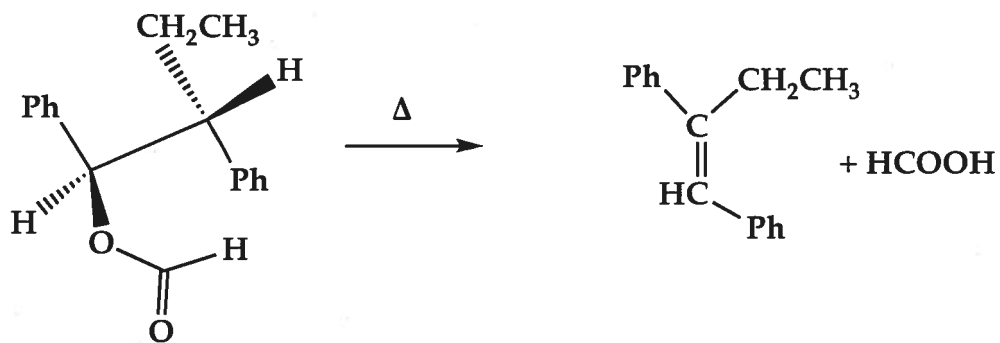
hexethal

4. (10 pts) Consider the elimination reactions. a) shows 2nd kinetics but b) is 1st order. Show a mechanism for each.

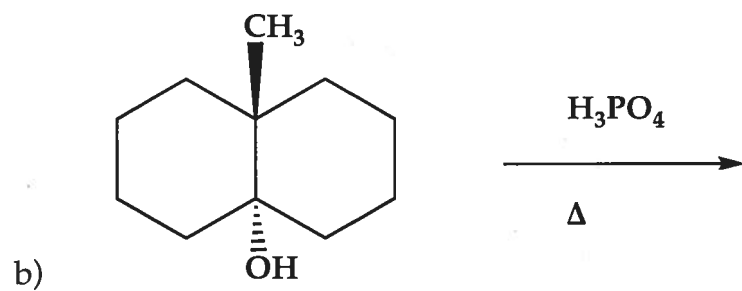
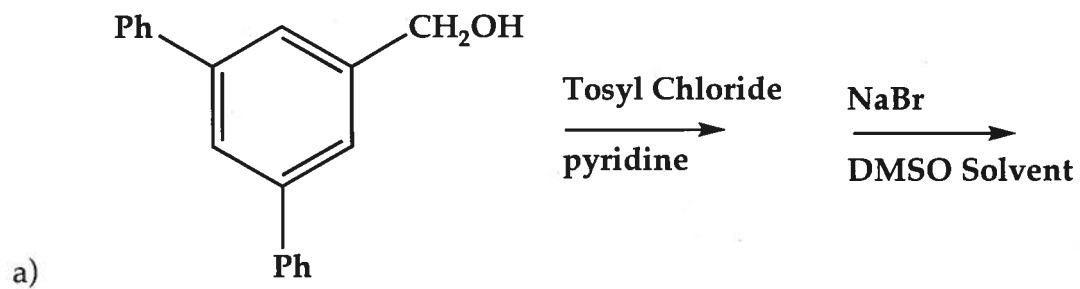
a)



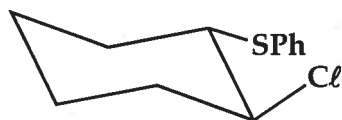
b)



5. (10 pts) Complete the following reactions.



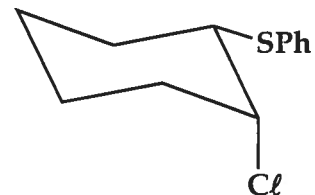
6. (15 pts) Consider the 3 compounds below. Show a mechanism that accounts for the following observations. a) In 80% aqueous ethanol, compound A reacts to form compound B. The *trans* isomer of B is the only stereoisomer formed; none of the *cis* isomer is observed. b) Optically active A gives completely racemic B. c) The reaction of A is 10^5 times faster than the analogous reaction of C.



A

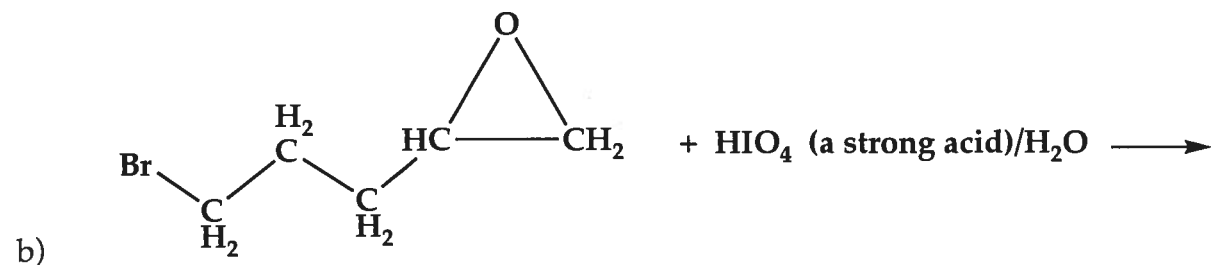
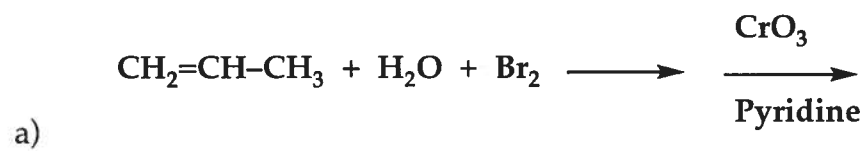


B



C

7. (15 pts) Complete the following reactions.



c)

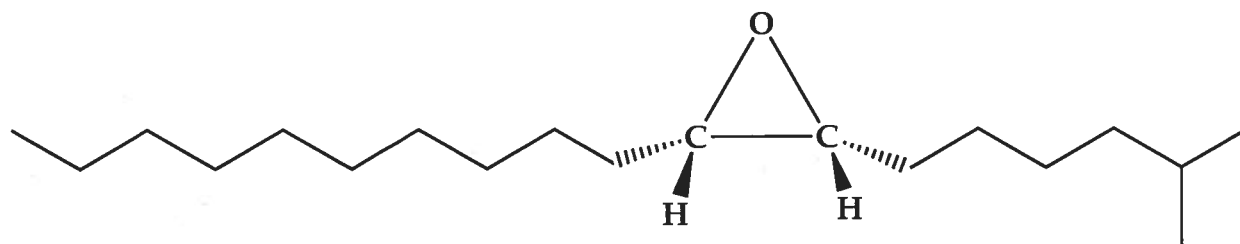


8. (10 pts) On the basis of the hybrid orbitals, arrange the bonds in order of increasing length.

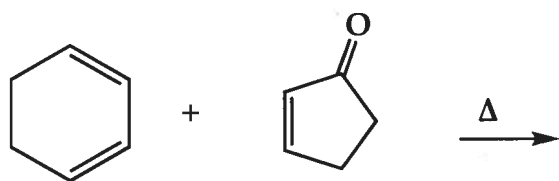
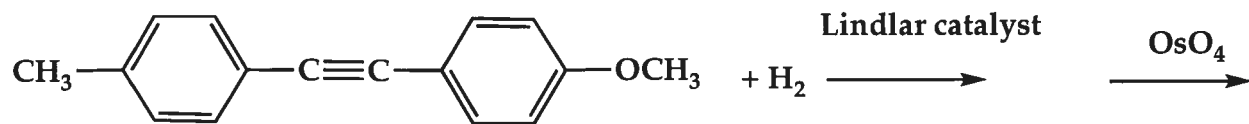
a) C-H bond of ethylene, C-H bond of ethane, C-H bond of acetylene

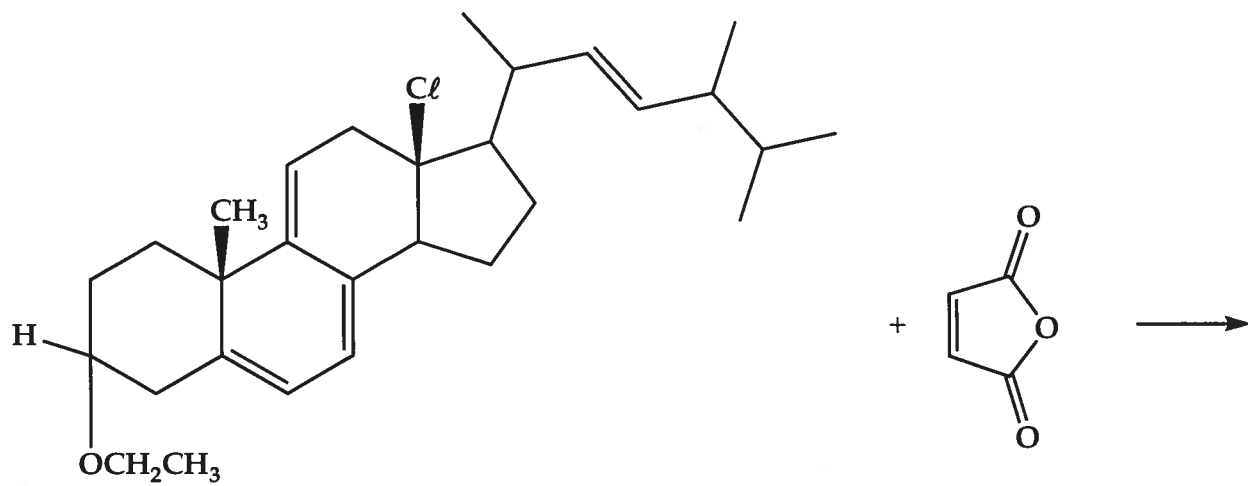
b) C-C single bond of propane, C-C single bond of propyne, C-C single bond of propene

9. (10 pts) Outline a preparation of the racemic epoxide from acetylene and any other compound with 5 carbons or less.

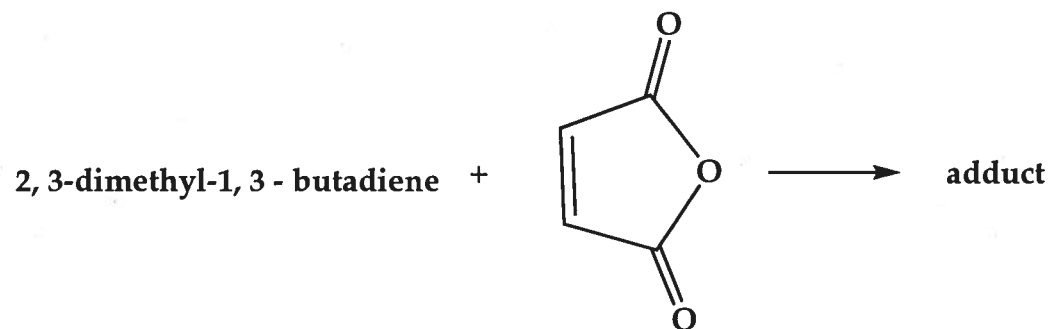


10. (15 pts) Complete the following reactions.

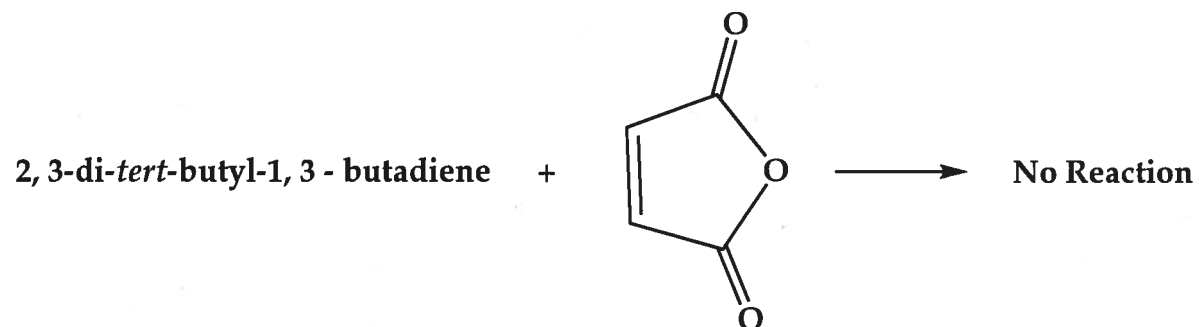




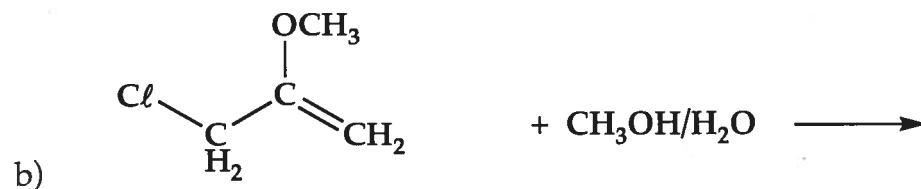
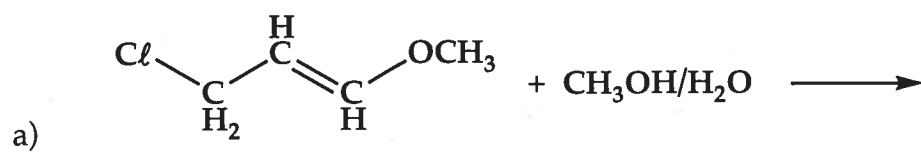
12. (10 pts) What is the product of the reaction?



Why does this reaction fail?



12. (10 pts) Which of the two alkyl halides would react most rapidly in a solvolysis reaction by the S_N1 mechanism? Why?



13. (15 pts) When 1,3-cyclopentadiene containing a ^{13}C label only at C-5 is treated with potassium hydride, K^+H^- , a species X is formed and a gas is evolved. When the reaction is quenched with H_2O , a mixture of ^{13}C -labeled 1,3 cyclopentadienes is formed.

a) Identify X and the evolved gas

b) Explain the origin and percentages of the three labeled cyclopentadienes

