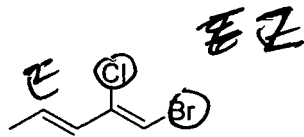


Name KEY  
CHE 241, Test 2b  
October 25, 2007

1. Multiple choice. Choose the one best answer for each question. (2 points each)

Which is the correct IUPAC name for the following structure?

- (a) (1Z,3Z)-1-bromo-2-chloro-1,3-pentadiene
- (b) (1Z,3E)-1-bromo-2-chloro-1,3-pentadiene
- (c) (1E,3Z)-1-bromo-2-chloro-1,3-pentadiene
- (d) (1E,3E)-1-bromo-2-chloro-1,3-pentadiene

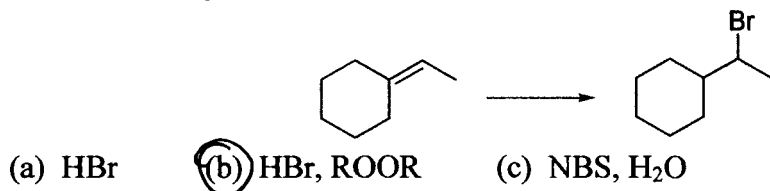


90+ /  
50+ /  
70+ //  
60+ //  
50

Which of the following is true of meso compounds?

- (a) Plane polarized light passes through with no observable changes
- (b) Both enantiomers are present in equal amounts.
- (c) No light will pass through the meso compounds.
- (d) None of the above statements are true.
- (e) More than one of the above statements are true.

Which of the following is the best method to accomplish the transformation shown?



- (a) HBr
- (b) HBr, ROOR
- (c) NBS, H<sub>2</sub>O
- (d) Br<sub>2</sub>

What is the relationship between the following compounds?

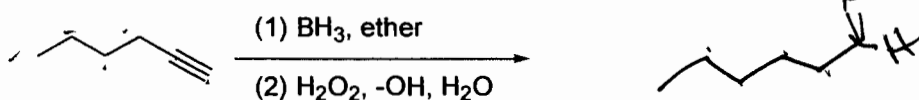
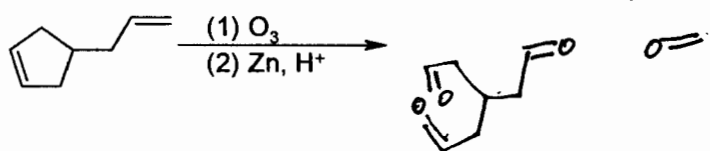
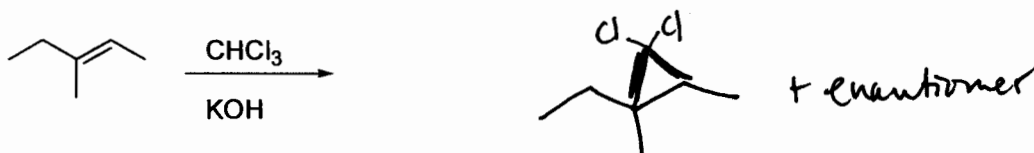
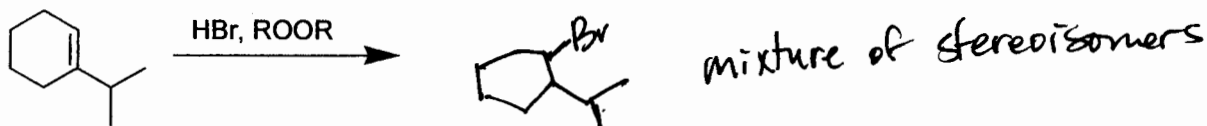
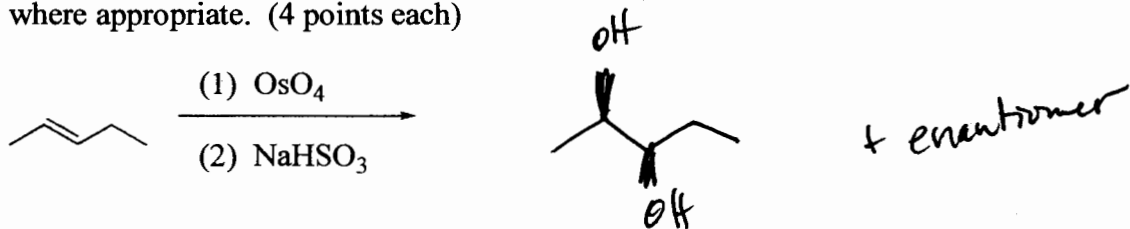


- (a) constitutional isomers
- (b) enantiomers
- (c) diastereomers
- (d) conformational isomers
- (e) identical compounds

Which of the following is the best way to synthesize 2,2-dibromopropane?

- (a) propene + Br<sub>2</sub>
- (b) propene + Br<sub>2</sub>, hv
- (c) propyne + 2 HBr
- (d) propyne + 2 HBr, ROOR

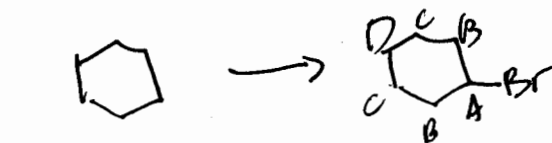
2. Provide the major product(s) for each of the following reactions, showing stereochemistry where appropriate. (4 points each)



3. (a) You are given a mixture of benzoic acid and naphthalene. How would you separate them? (5 points)

~~acid base extraction~~ dissolve in  $CH_2Cl_2$  & then extract with NaOH to get benzoic acid. Neutralized of base extract to get the acid after filtration. Dry the organic layer & evaporate to get naphthalene.

(b) A student carried out a reaction that transformed cyclohexane into bromocyclohexane. Would it be easy for her to distinguish these compounds using NMR? Predict what the  $^1H$  NMR spectra will look like for each of these compounds. (5 points)



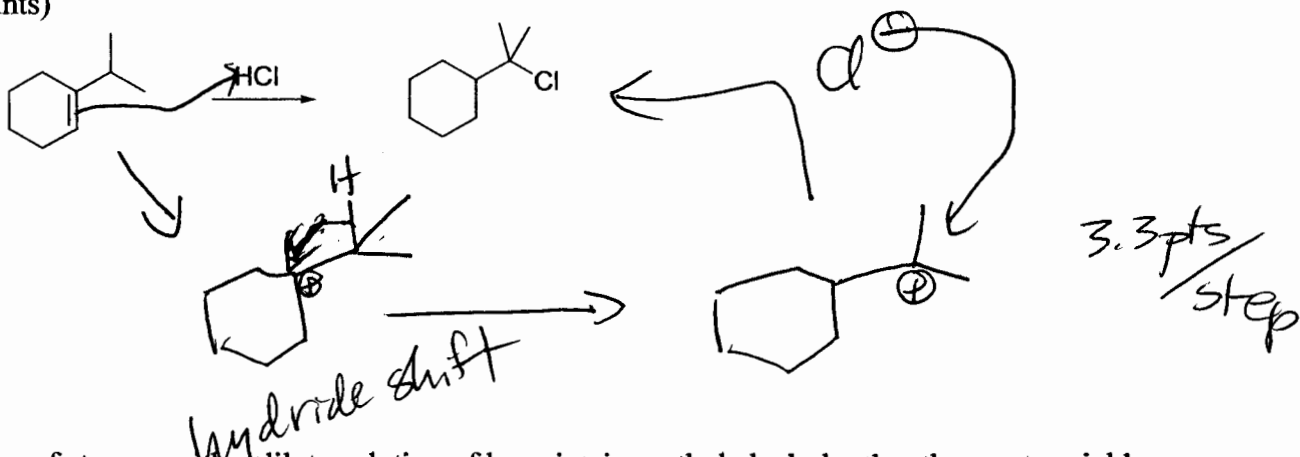
1 signal  
~~by C-13~~  
or 'H

4 signals by ~~C-13~~

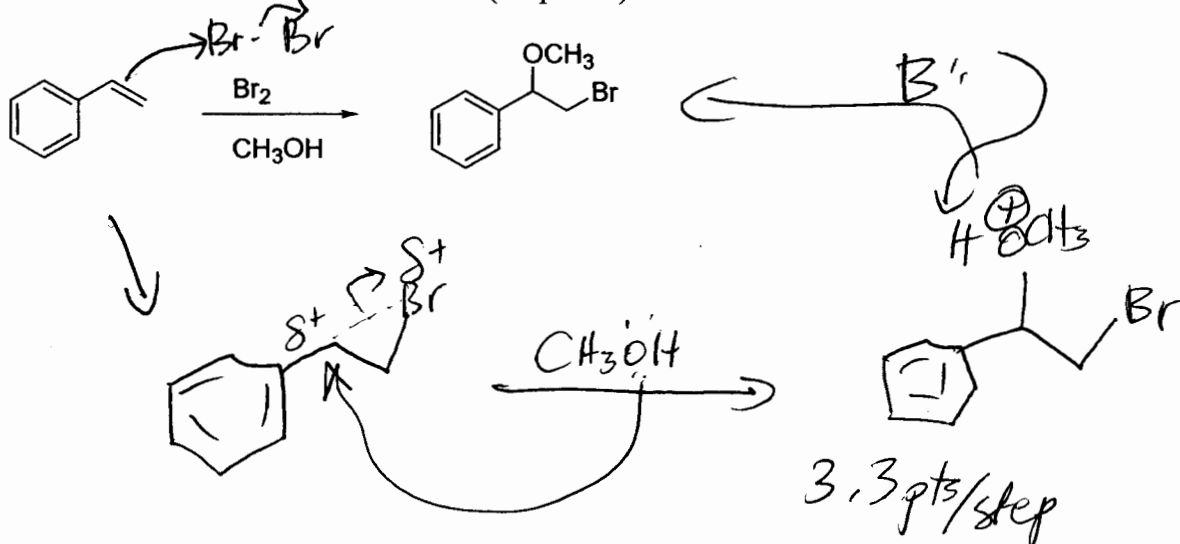
A	1H	pentet	farthest downfield
B	4H	quartet	
C	4H	pentet	
D	2H	pentet	farthest upfield

$1 \times 2 = 2$   
 $(1 \times 2) = 2$

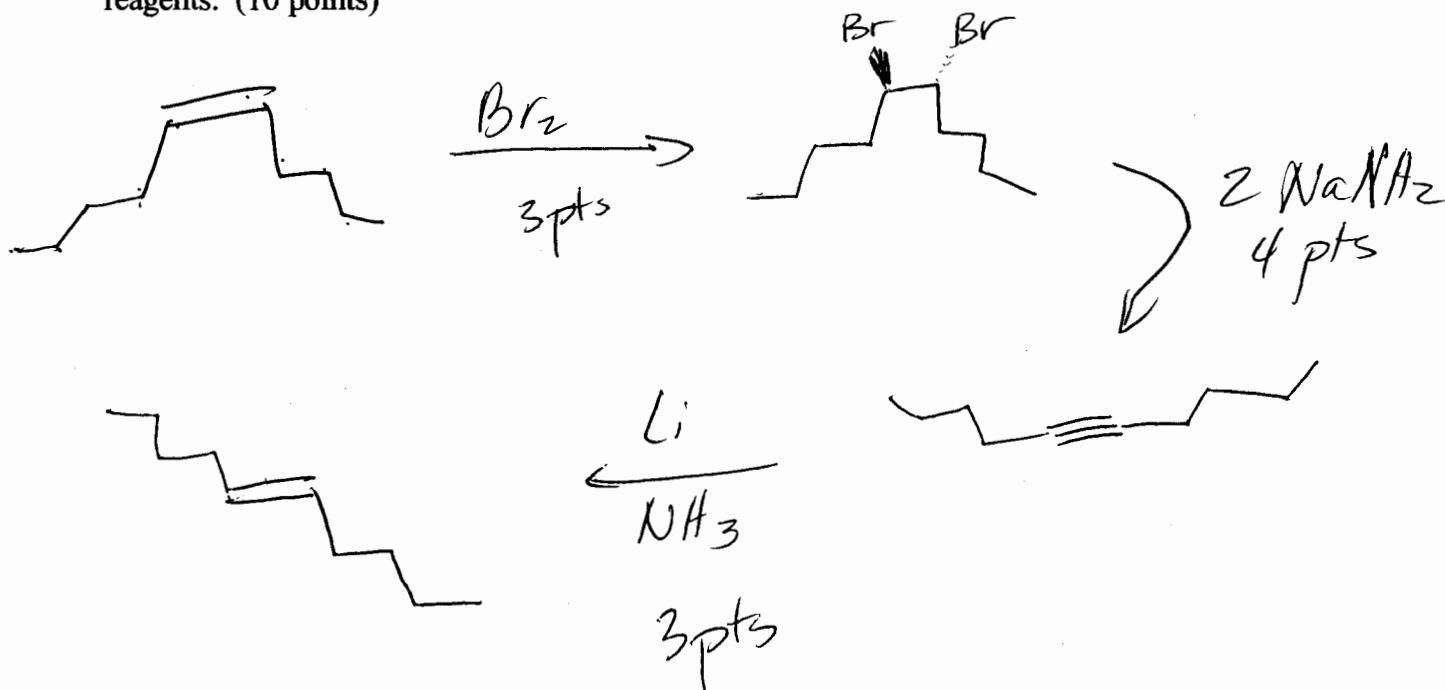
4. Propose a mechanism for the following reaction, using arrows to show the flow of electrons. (10 points)



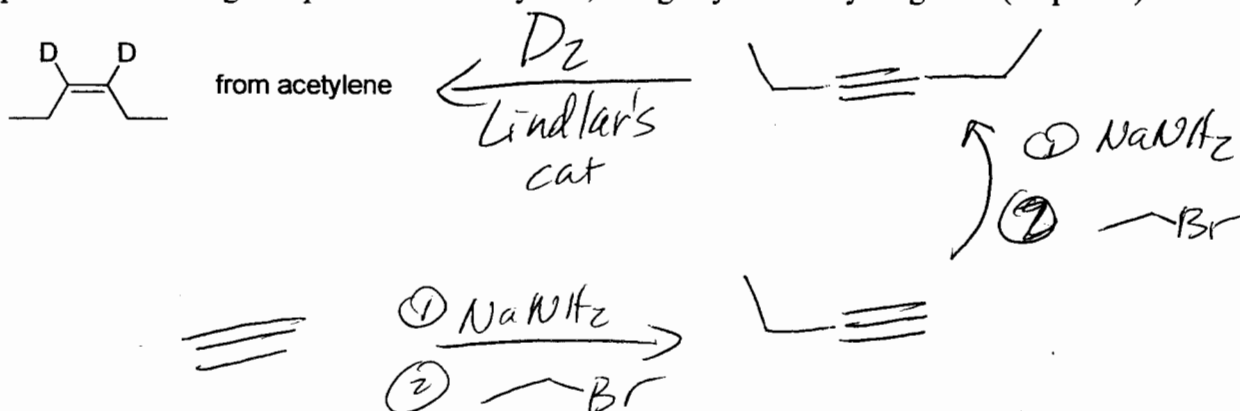
Reaction of styrene with a dilute solution of bromine in methyl alcohol rather than water yields the corresponding methyl ether rather than the alcohol. Propose a mechanism for this reaction, using arrows to show the flow of electrons. (10 points)



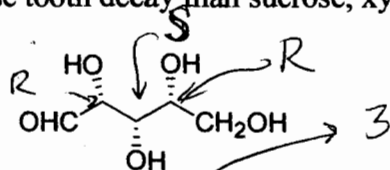
5. (a) Propose a method to convert *cis*-5-decene to *trans*-5-decene, using any necessary reagents. (10 points)



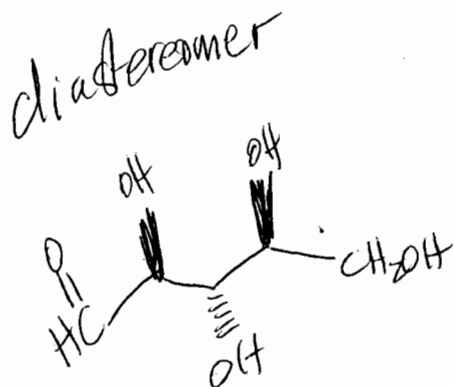
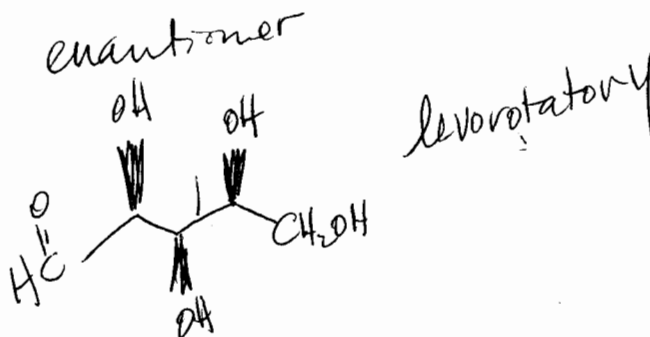
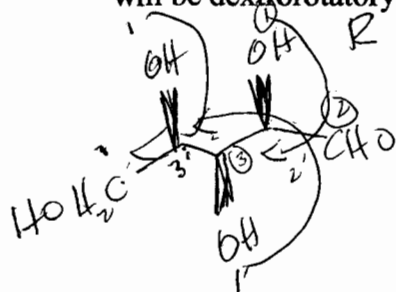
(b) Prepare the following compound from acetylene, using any necessary reagents. (10 points)



6. Xylose is a common sugar found in many types of wood, including maple and cherry. Because it is much less prone to cause tooth decay than sucrose, xylose has been used in candy and chewing gum. (20 points)



- How many stereogenic centers does xylose have? Identify them and assign the absolute configuration (R or S) to each one.
- How many stereoisomers of xylose are there? 8
- Draw the structure of the enantiomer of xylose. If possible, predict whether this compound will be dextrorotatory or levorotatory. If it's not possible, explain why.
- Draw the structure of a diastereomer of xylose. If possible, predict whether this compound will be dextrorotatory or levorotatory. If it's not possible, explain why.



not possible  
 to predict  
 optical  
 activity