

Chemistry 333

Examination #3

May 5, 2003

Professor Charonnat

Name: \_\_\_\_\_

Be certain that your examination has five (5) pages including this one.

Put your name on **each** page of this examination booklet.

By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

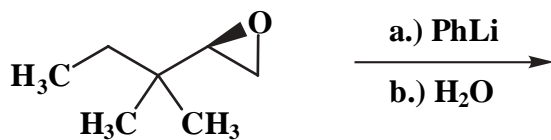
Molecular models are allowed for this examination. Calculators are unnecessary and are not allowed.

Name: \_\_\_\_\_

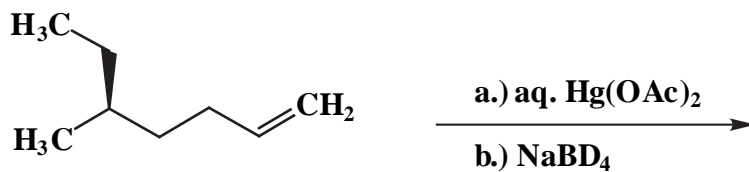
1. (25 points)

Draw the structure of the expected major organic product for each of the following five (5) questions. Clearly specify stereochemistry, if relevant.

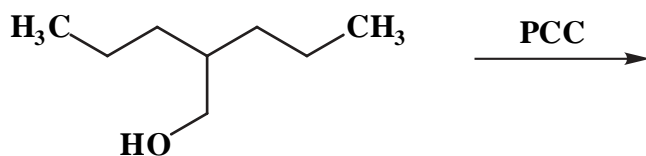
A.



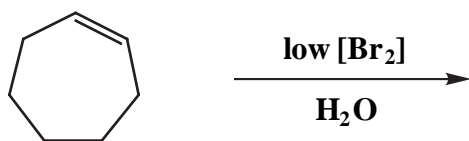
B.



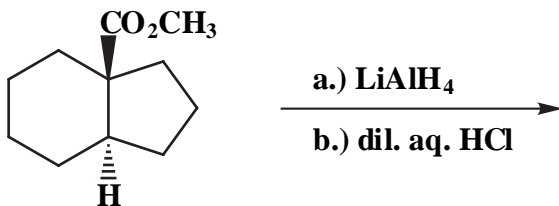
C.



D.



E.



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2. (25 points)

Circle the number that corresponds to the correct answer for each of the following five (5) questions.

A. Which of the following compounds is the most stable alkene?

1. 1-hexene
2. *trans*-3-hexene
3. *cis*-3-hexene

B. Which reaction should proceed most rapidly?

1. HBr addition to 2-methyl-1-pentene
2. HBr addition to 1-pentene
3. HBr addition to ethylene

C. Hydroboration/oxidation of *trans*-4,4-dimethyl-2-pentene affords:

1. the corresponding (*S*)-alcohol
2. the corresponding (*R*)-alcohol
3. a racemic mixture of the corresponding (*S*)- and (*R*)-alcohols

D. The acid-catalyzed reaction of a carboxylic acid and an alcohol affords an:

1. ether
2. epoxide
3. ester

E. Osmium tetroxide dihydroxylation of an alkene occurs with:

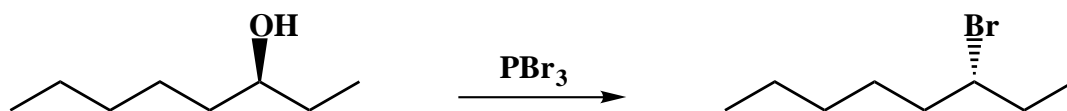
1. anti-addition of the two hydroxyls
2. syn-addition of the two hydroxyls
3. both anti- and syn-addition of the two hydroxyls

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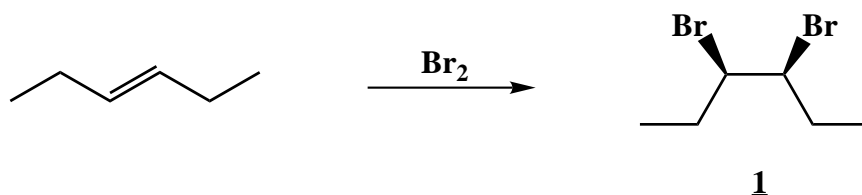
3. (20 points)

Answer the following two (2) questions precisely, succinctly and with correct grammar. Draw representative structures to illustrate each answer.

A. Why does the following reaction occur with inversion of configuration?

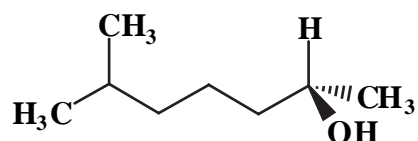


B. Why is the *meso*-1,2-dibromide **1** obtained exclusively in the following reaction?



4. (10 points)

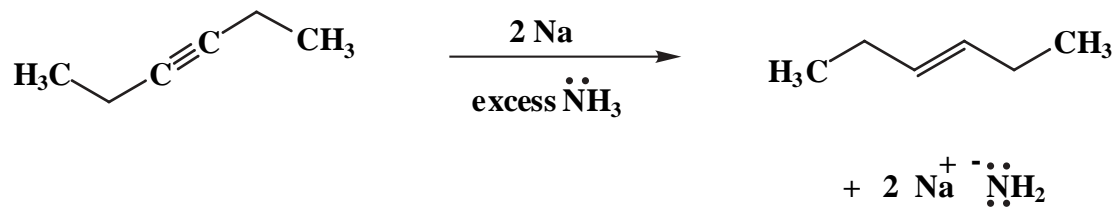
Use IUPAC nomenclature to write the systematic name of the following alcohol.



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5. (20 points)

Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all unshared electrons, formal charges and countercharges.



**Congratulations!**

1	/25
2	/25
3	/20
4	/10
<u>5</u>	<u>/20</u>
Total:	/100