

Chemistry 333

Examination #3

May 10, 2004

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.

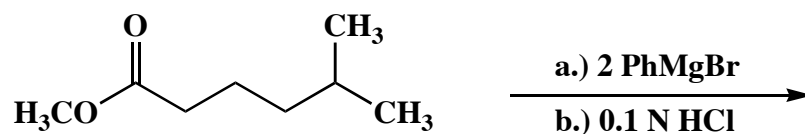
Molecular models are allowed for this examination. Calculators are unnecessary and are not allowed.

Name: _____

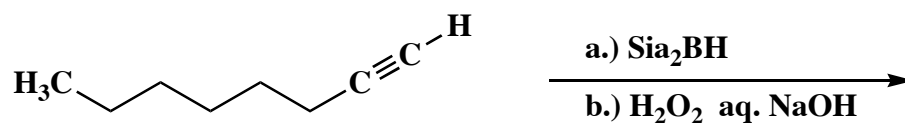
1. (25 points)

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

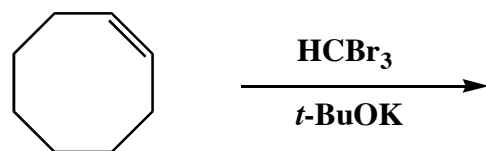
A.



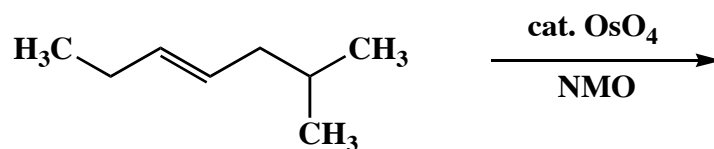
B.



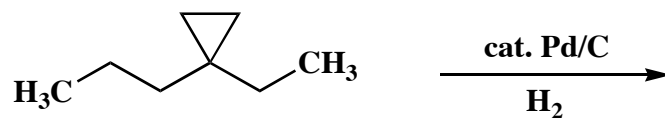
C.



D.



E.



Name: _____

2. (25 points)

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

A. Lithium aluminum hydride reduction of ketones affords:

1. primary alcohols
2. secondary alcohols
3. tertiary alcohols

B. Which hydrocarbon is the most acidic?

1. *trans*-2-pentene
2. 2-pentyne
3. 1-pentyne

C. Pyridinium chlorochromate oxidation of 1-pentanol affords:

1. an aldehyde
2. a ketone
3. a carboxylic acid

D. The reaction of phosphorus tribromide with (*R*)-3-hexanol affords:

1. (*R*)-3-bromohexane
2. (*S*)-3-bromohexane
3. a 1:1 mixture of (*R*)-3-bromohexane and (*S*)-3-bromohexane

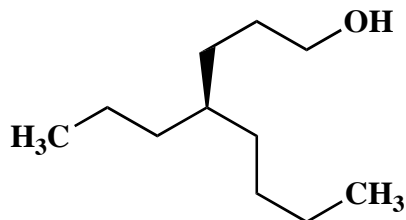
E. Oxymercuration/demercuration of alkenes affords alcohols via:

1. carbocation intermediates
2. mercurinium ion intermediates
3. carbanion intermediates

Name: _____

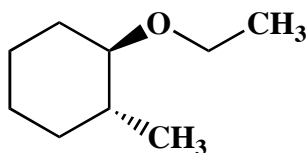
3. (10 points)

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



4. (15 points)

Design a synthesis of the following, racemic ether from methylcyclohexene, organic compounds that contain three or fewer carbons, and any additional inorganic reagents that are necessary. Show all reagents and stable synthetic intermediate compounds. Use a star to mark each step that creates a chiral product. Explain clearly why each starred step affords a racemic mixture.

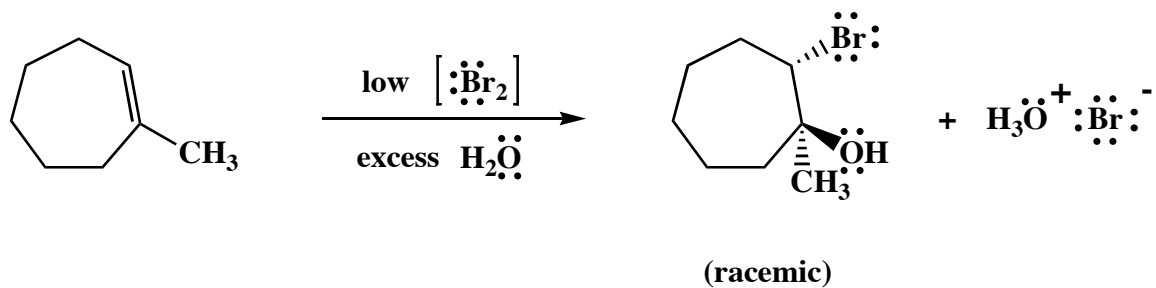


(racemic)

Name: _____

5. (25 points)

Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates and denote all lone pair electrons, formal charges and countercharges where appropriate. Explain why a racemic mixture is obtained, and why the compound shown is the major product rather than a regioisomer.



Congratulations!

1	/25
2	/25
3	/10
4	/15
5	/25
Total:	/100