

Chemistry 333

Examination #3

November 15, 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.

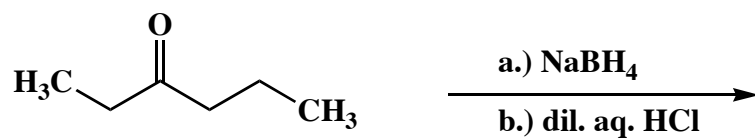
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

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

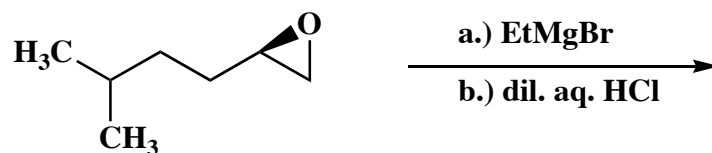
1. (25 points)

Denote the major organic product for each of the following five (5) questions. Specify stereochemistry clearly, if relevant.

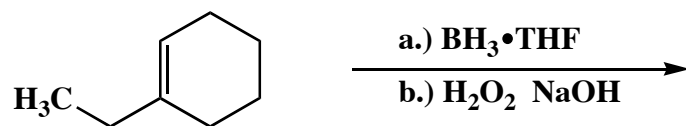
A.



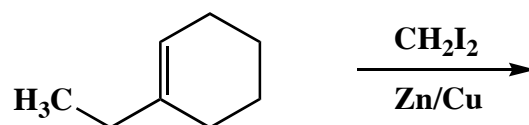
B.



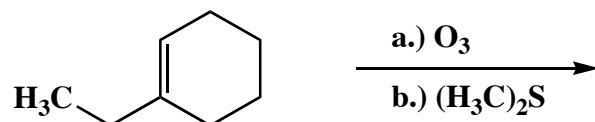
C.



D.



E.



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

2. (25 points)

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

A. The Williamson ether synthesis is

1. an oxidation followed by an  $S_N2$  reaction
2. an acid-base reaction followed by an  $S_N2$  reaction
3. an acid-base reaction followed by an E2 reaction

B. PCC oxidation of secondary alcohols affords

1. aldehydes
2. ketones
3. carboxylic acids

C. Halohydrins of trisubstituted alkenes are formed by the opening of a cyclic halonium ion via

1. an  $S_N2$  mechanism
2. an  $S_N1$  mechanism
3. an  $S_N2$  mechanism with  $S_N1$  character

D. The conversion of a secondary alcohol to the corresponding tosylate occurs with

1. inversion of configuration
2. retention of configuration
3. racemization

E. The sigma bond of an alkyne

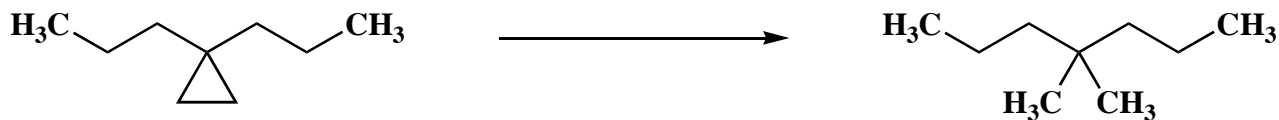
1. is stronger than the sigma bond of an alkane
2. is weaker than the sigma bond of an alkane
3. has the same strength as the sigma bond of an alkane

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

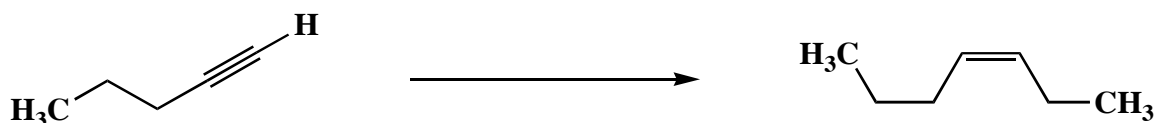
3. (20 points)

Draw the specific reagent(s) necessary to effect the following three (3) transformations. If more than one reaction is involved in an answer, be certain to distinguish the individual steps clearly.

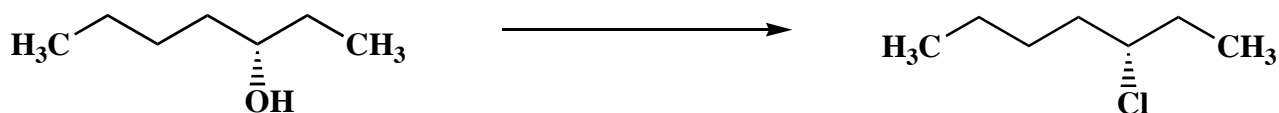
A.



B.



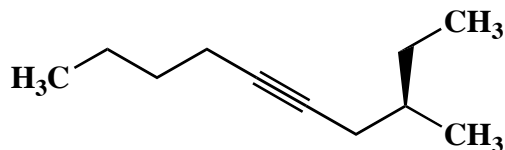
C.



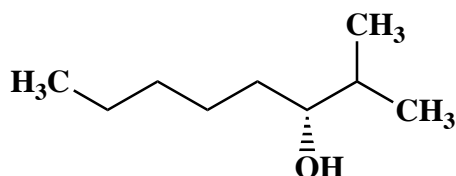
4. (10 points)

Use IUPAC nomenclature to write the systematic names of the following two (2) compounds.

A.



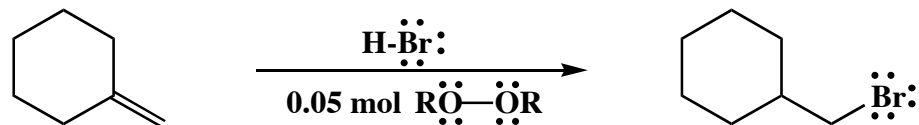
B.



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

5. (20 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 unshared electrons.



**Congratulations!**

|              |            |
|--------------|------------|
| 1            | /25        |
| 2            | /25        |
| 3            | /20        |
| 4            | /10        |
| 5            | /20        |
| <hr/> Total: | <hr/> /100 |