

Chemistry 334

Examination #2

August 3, 2009

Professor Charonnat

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

Be certain that your examination has six (6) 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.

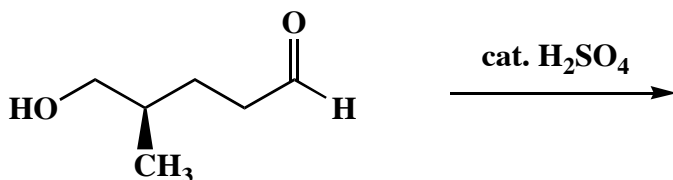
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

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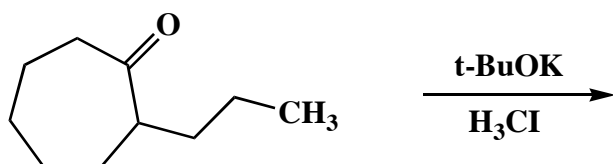
1. (25 points)

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

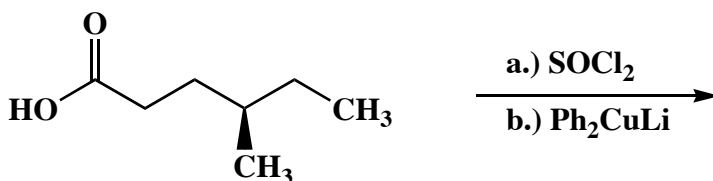
A.



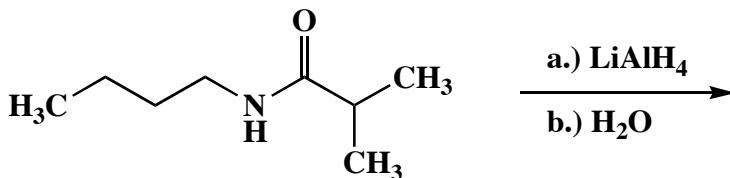
B.



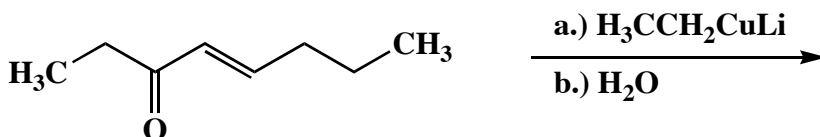
C.



D.



E.



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2. (30 points)

Circle the number that corresponds to the correct answer for each of the following six (6) questions.

A. In the mechanism of the Wittig reaction, a phosphorus ylide reacts with a ketone or aldehyde to form

1. a phosphonium salt intermediate
2. a betaine intermediate
3. an oxaphosphetane intermediate

B.  $\beta$ -Lactam antibiotics function by blocking

1. acetal formation between carbohydrates
2. amide formation between peptides
3. linkage of peptides to carbohydrates

C. How many moles of sodium hydroxide are required to convert heptanoyl chloride into the corresponding carboxylate salt?

1. catalytic amounts
2. one mole
3. two moles

D. The Schotten-Baumann reaction is successful because

1. hydroxide anion exists in the aqueous, not organic phase
2. the amine is more nucleophilic than hydroxide anion
3. a molar excess of the amine is used

E. Overall, the hydrolysis of benzyl hexanoate with dilute sulfuric acid is

1. a substitution
2. an addition
3. an elimination

F. The carboxylate anion of 2-fluoropropanoic acid is stabilized by

1. resonance only
2. inductive effects only
3. both

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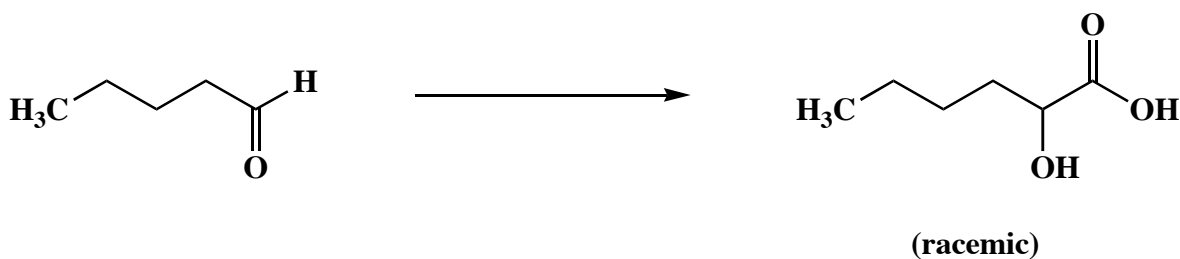
3. (20 points)

Draw the specific reagent(s) necessary to effect the following two (2) transformations. If more than one reaction is involved in an answer, be certain to distinguish the individual steps clearly.

A.



B.



4. (20 points)

Answer the following two (2) questions precisely, succinctly and with correct grammar.

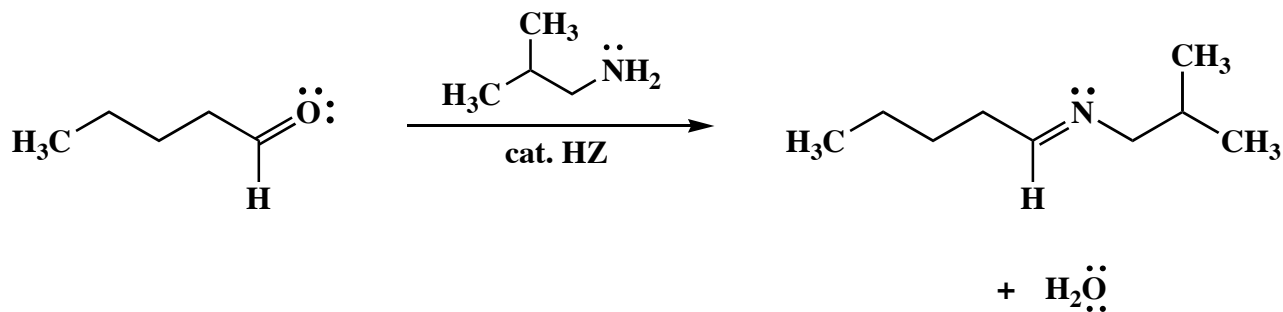
A. Explain why nucleophiles bond to the 3-, not the 4-position of cyclooct-2-enone.

B. Describe how Bender's work proved that ester hydrolysis occurs via an addition/elimination process.

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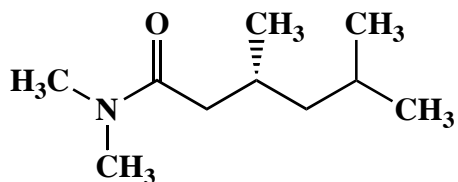
5. (30 points)

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, formal charges and countercharges where appropriate. (Note: HZ is a weak acid.)



6. (10 points)

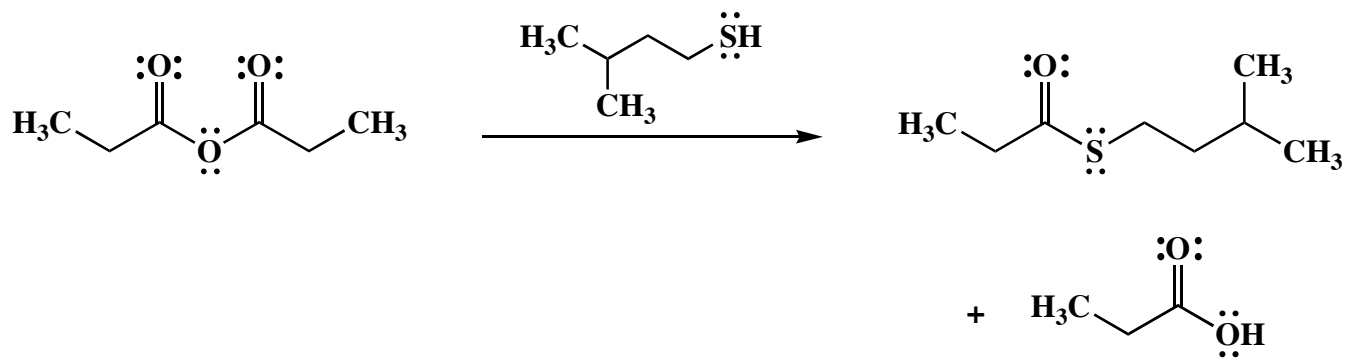
Use IUPAC nomenclature to write the systematic name of the following carbonyl compound.



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7. (15 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, formal charges and countercharges where appropriate. Draw important resonance structures for intermediates where appropriate, also.



**Congratulations!**

1	/25
2	/30
3	/20
4	/20
5	/30
6	/10
7	/15
<hr/> Total:	<hr/> /150