

Chemistry 334

Examination #2

August 8, 2011

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.

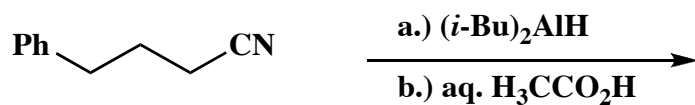
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

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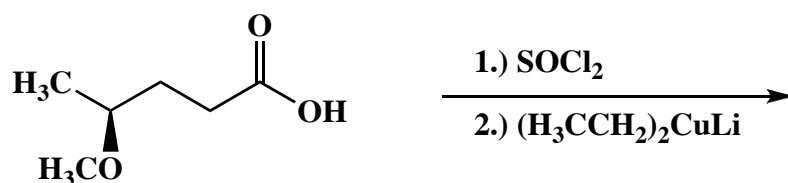
1. (25 points)

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

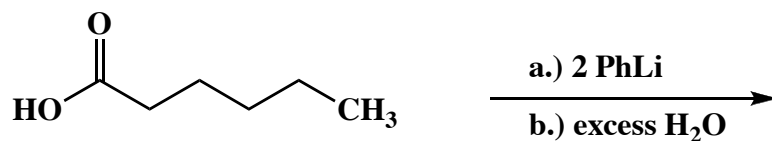
A.



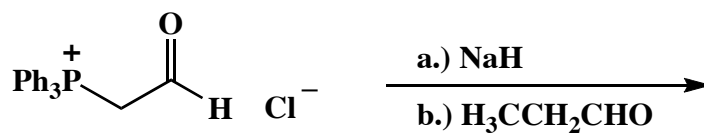
B.



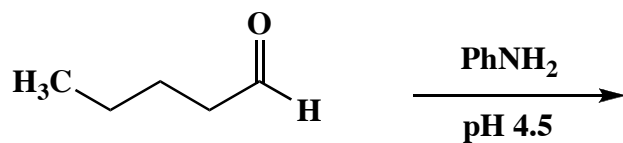
C.



D.



E.

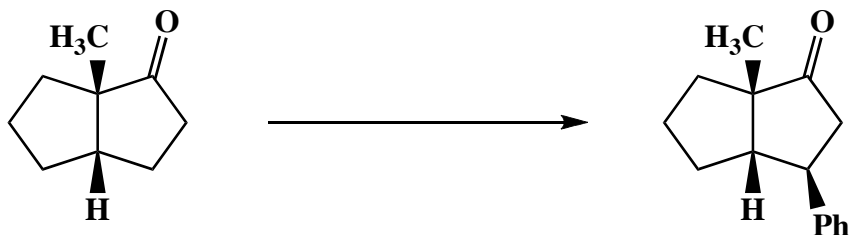


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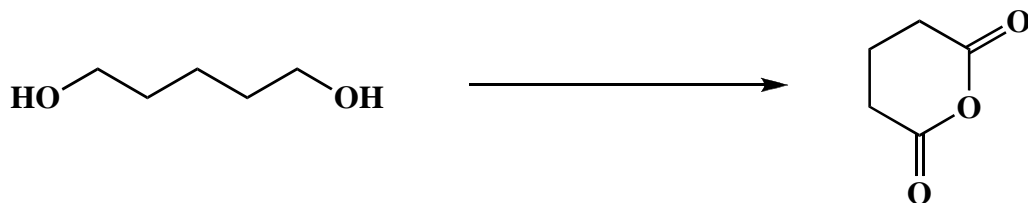
2. (40 points)

Draw the specific reagent(s) necessary to effect the following four (4) transformations. If more than one reaction is involved in an answer, be certain to distinguish the individual steps clearly.

A.



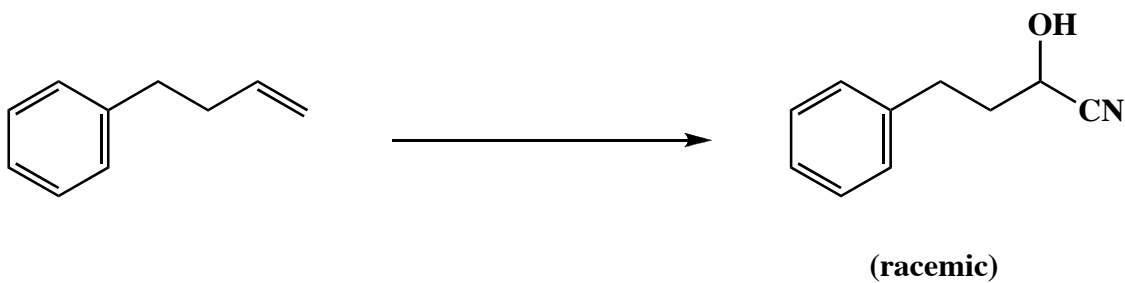
B.



C.



D.



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3. (25 points)

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

A. If a significant amount of water is present in a Fischer esterification, the equilibrium will be

1. shifted toward the products
2. shifted toward the reactants
3. unaffected

B. When hex-5-en-2-one is treated with lithium diisopropylamide (LDA) followed by allyl bromide, the broadband proton-decoupled  $^{13}\text{C}$  NMR spectrum of the product will possess

1. five resonances
2. six resonances
3. nine resonances

C. Provided that there is sufficient orbital overlap, intramolecular reactions occur

1. faster than the corresponding intermolecular reactions
2. slower than the corresponding intermolecular reactions
3. at the same rate as intermolecular reactions

D. The most intense infrared absorption of pentanoic acid is the

1. C–H stretch
2. C–O stretch
3. C=O stretch

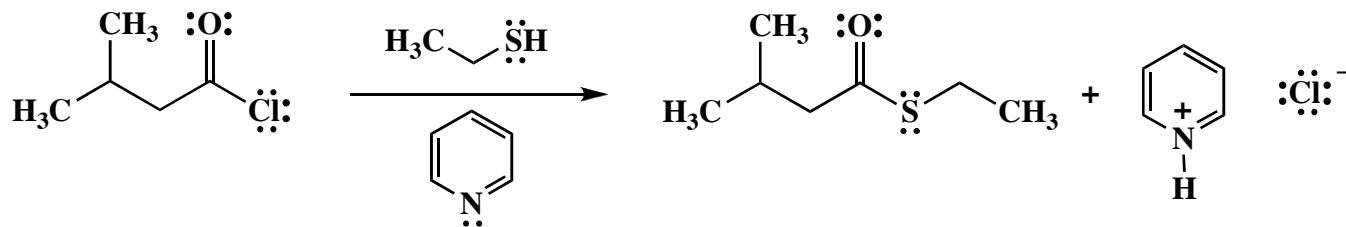
E. The reaction of carboxylic acids with diazomethane is

1. reversible at low temperature
2. reversible at high temperature
3. irreversible

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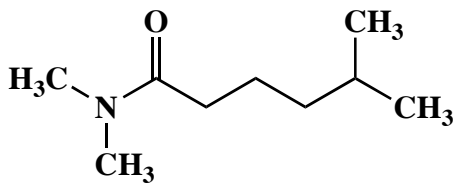
4. (15 points)

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, nonzero formal charges, and countercharges where appropriate.



5. (10 points)

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



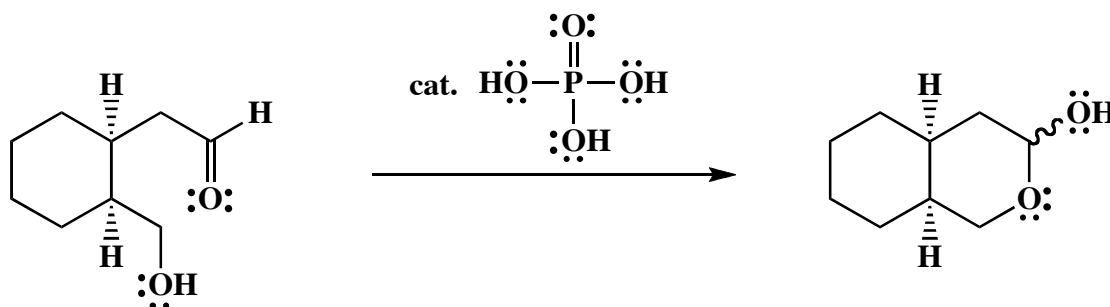
6. (10 points)

Why do acid chlorides react more rapidly with nucleophiles than ketones react with these reagents?

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7. (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 unshared electrons, nonzero formal charges, and countercharges where appropriate. Finally, explain briefly why only a catalytic, not a stoichiometric amount of phosphoric acid is required.



**Congratulations!**

1	/25
2	/40
3	/25
4	/15
5	/10
6	/10
7	/25
<b>Total:</b>	<b>/150</b>