

Chemistry 334

Examination #2

November 1, 1999

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.

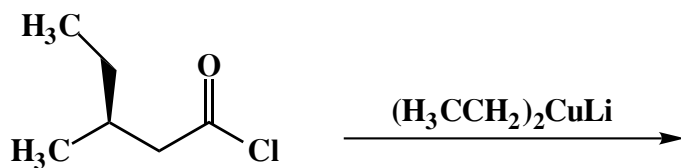
By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

Name: _____

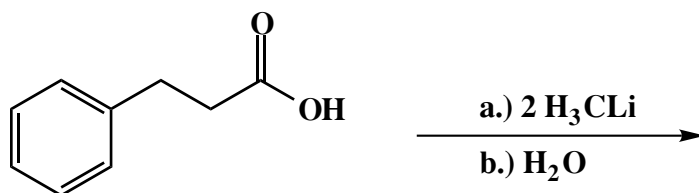
1. (25 points)

For each of the following five (5) questions, draw the structure of the expected major organic product. If relevant, explicitly specify absolute and/or relative stereochemistry.

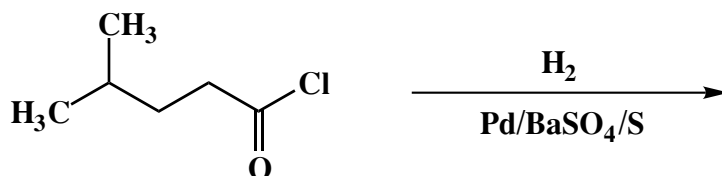
A.



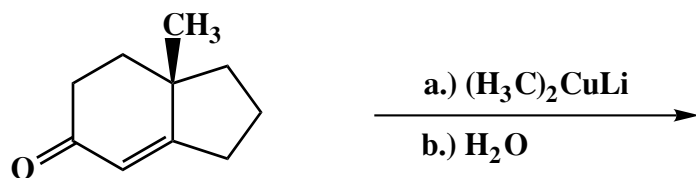
B.



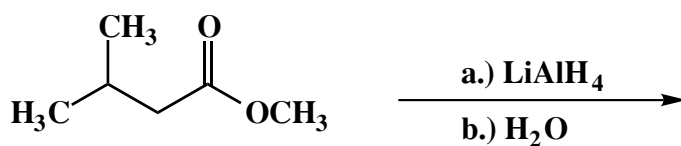
C.



D.



E.



Name: _____

2. (20 points)

For each of the following five (5) questions, circle the number that corresponds to the correct answer.

A. The reaction of a ketone with a primary amine and a weak acid affords:

1. an amide
2. an enamine
3. an imine

B. Rank the following compounds in terms of increasing acidity:

1. propionic acid, 2-bromopropionic acid, 3-bromopropionic acid
2. propionic acid, 3-bromopropionic acid, 2-bromopropionic acid
3. 3-bromopropionic acid, 2-bromopropionic acid, propionic acid

C. The ^1H NMR spectrum of 2-methylbutanal will show the aldehyde proton as a:

1. doublet
2. triplet
3. quartet

D. The carbonyl C=O stretch is often the most intense absorption in an infrared spectrum. The intensity of this absorption is due to the carbonyl group's:

1. dipole moment
2. steric hindrance
3. hybridization

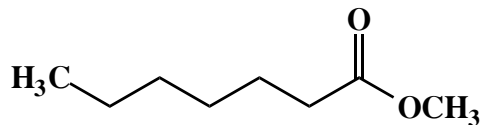
E. Hydroboration/oxidation of a terminal alkyne affords:

1. an alcohol
2. an aldehyde
3. a ketone

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3. (10 points)

Use IUPAC nomenclature to write the systematic name of the following carboxylic acid derivative.



4. (10 points)

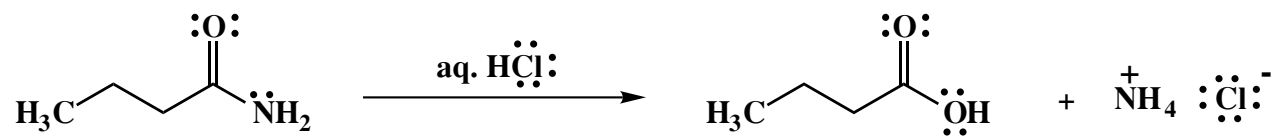
Answer the following question precisely, succinctly and with correct grammar.

Why does a typical phosphonium salt used for a Wittig reaction have the following structure: $(\text{Ph})_3\text{P}^+\text{CH}_2\text{R} \text{X}^-$ ($\text{R} = \text{H}$, alkyl or aryl; $\text{X}^- = \text{halide anion}$)? Specifically, why are there three phenyl groups directly bonded to the phosphorus? What would happen if one of the phenyl groups was replaced with an alkyl group?

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5. (25 points)

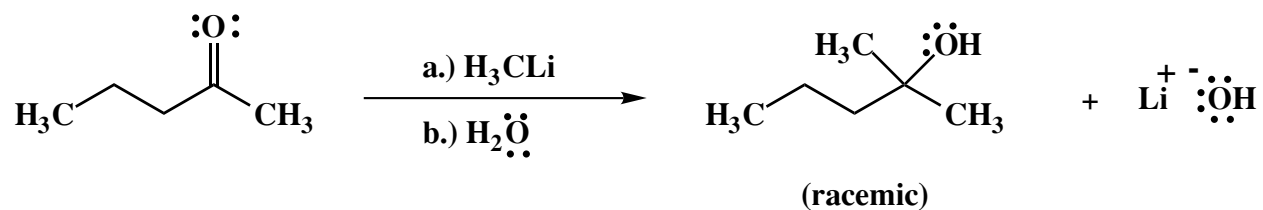
Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates and denote all lone pair electrons, formal charges and countercharges where appropriate.



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6. (10 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.



Congratulations!

1	/25
2	/20
3	/10
4	/10
5	/25
6	/10
Total:	/100