

Chemistry 334

Examination #1

March 6, 2000

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.

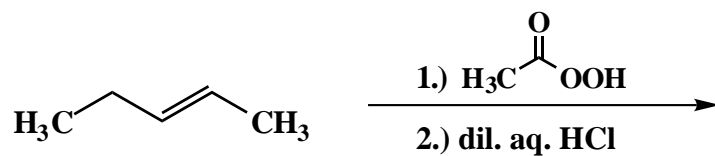
By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

Name: _____

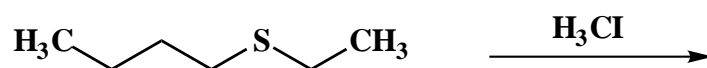
1. (25 points)

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

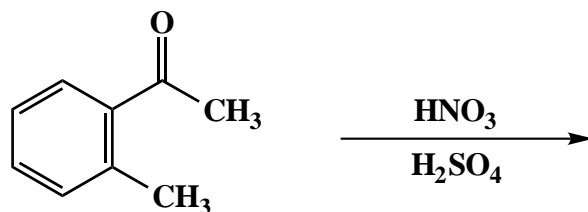
A.



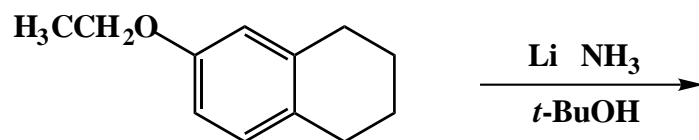
B.



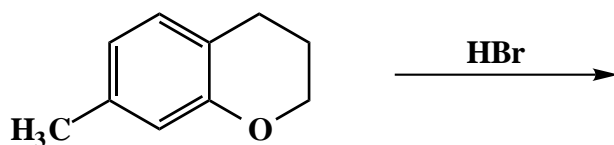
C.



D.



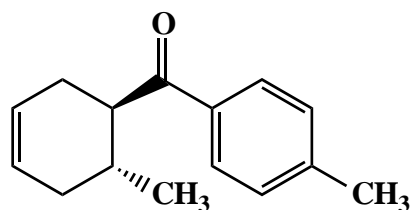
E.



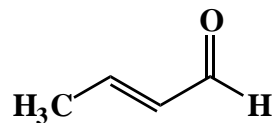
Name: _____

2. (20 points)

Design a synthesis of the racemic ketone **1** from 4-bromotoluene, the aldehyde **2** and any additional organic and inorganic reagents that are necessary. Show all reagents and stable synthetic intermediate compounds. Use a star to mark the first step that creates a chiral product. Explain clearly why this step affords a racemic mixture.



1

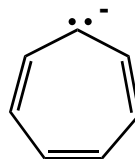
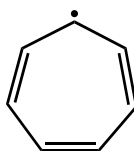
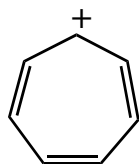


2

Name: _____

3. (10 points)

Put a star next to each of the following compounds that is aromatic. Clearly state your reasoning.



4. (20 points)

For each of the following four (4) questions, circle the number that corresponds to the correct answer.

A. The broadband proton-decoupled ^{13}C NMR spectrum of *cis*-4,5-epoxyoctane contains:

1. 4 resonances
2. 6 resonances
3. 8 resonances

B. The reaction of anisole (methoxybenzene) with molecular bromine and iron(III) bromide at the ortho position proceeds through a resonance-stabilized intermediate for which one can draw:

1. 3 reasonable resonance structures
2. 4 reasonable resonance structures
3. 5 reasonable resonance structures

C. 1,3-hexadiene is more stable than 1,4-hexadiene due to:

1. increased conformational mobility
2. decreased steric hindrance
3. conjugation

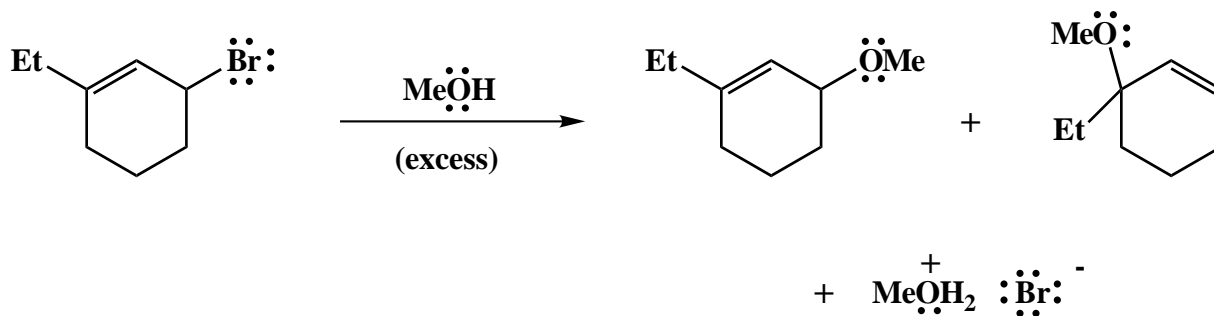
D. The addition of anhydrous hydrogen bromide to 1,3-butadiene at $-78\text{ }^{\circ}\text{C}$ affords:

1. the thermodynamically more stable product
2. the thermodynamically less stable product
3. a 1:1 mixture of the above two products

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. Draw all important resonance contributors for intermediates.



Congratulations!

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