

Chemistry 334

Examination #1

March 1, 2016

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 and cell phones, are unnecessary and are not allowed.

Name: _____

1. (25 points)

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

A. Alkoxymercuration/demercuration of alkenes forms ethers. This transformation involves the opening of a cyclic mercurinium ion with an alcohol molecule. The mechanism of this process follows an

1. S_N1 pathway
2. S_N2 pathway
3. S_N2 pathway with S_N1 character

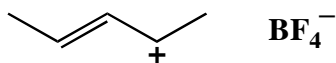
B. The absorbance of a UV-active compound is

1. the same at all wavelengths
2. a function of concentration
3. independent of concentration

C. The reaction of an unhindered alkoxide with benzyl bromide occurs via an

1. S_N1 mechanism
2. S_N2 mechanism
3. E1 mechanism

D. The broadband proton-decoupled ^{13}C NMR spectrum of the following ionic compound contains



1. three resonances
2. four resonances
3. five resonances

E. Electrophilic aromatic substitution occurs via a

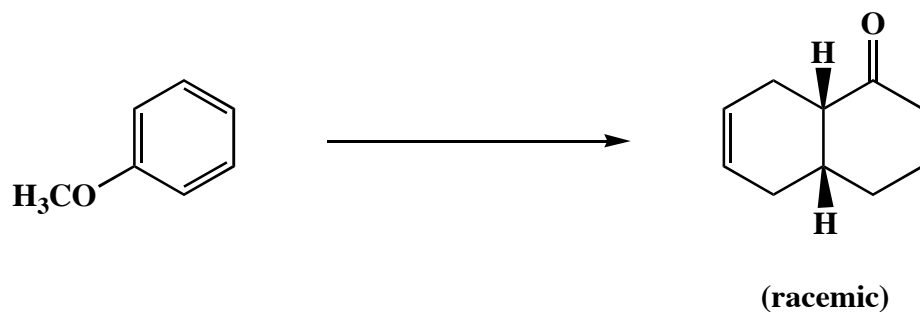
1. one-step mechanism
2. two-step mechanism, with a rate-determining first step
3. two-step mechanism, with a rate-determining second step

Name: _____

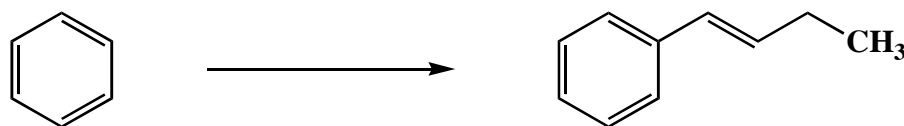
2. (25 points)

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.

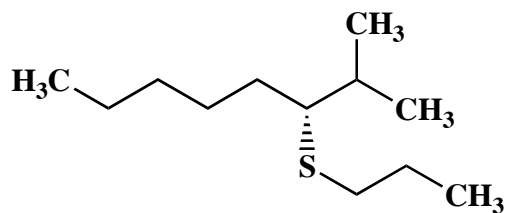


B.



3. (10 points)

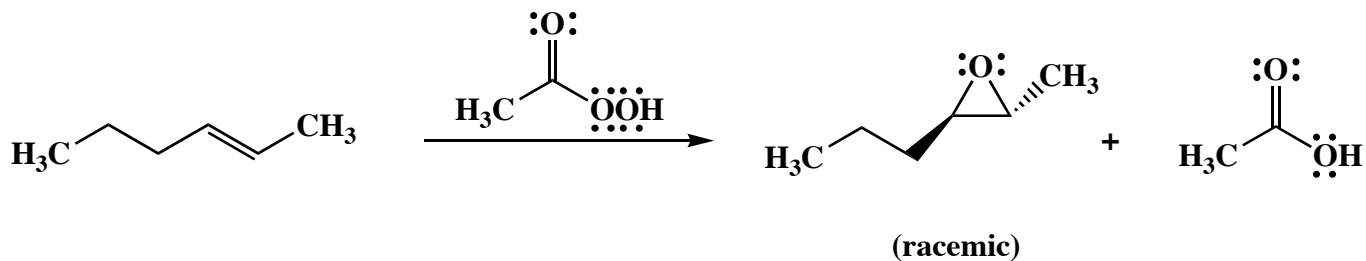
Use IUPAC nomenclature to write the systematic name of the following compound.



Name: _____

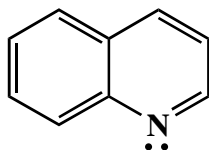
4. (20 points)

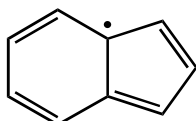
Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates and denote all unshared electrons, nonzero formal charges, countercharges, and reversibility or nonreversibility. Explain why a trans-1,2-disubstituted epoxide is formed, not the corresponding cis-diastereomer. Finally, explain why the product is racemic.

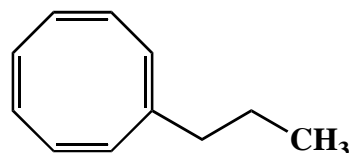


5. (10 points)

Classify each of the following three (3) species as aromatic, antiaromatic, or nonaromatic (neither aromatic nor antiaromatic).







Name: _____

6. (10 points)

Explain why the conjugated diene, (3Z,5Z)-octa-3,5-diene, does not participate in Diels-Alder reactions. Draw an annotated structural formula to illustrate your answer.

Congratulations!

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