

Chemistry 334

Examination #1

October 3, 2005

Professor Charonnat

Name: _____

Be certain that your examination has eight (8) 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.

Name: _____

1. (25 points)

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

A. When (*E*)-penta-1,3-diene is heated with methyl acrylate ($\text{H}_2\text{C}=\text{CHCO}_2\text{CH}_3$):

1. a 1,2-addition product is formed
2. a 1,3-addition product is formed
3. a 1,4-addition product is formed

B. When 4-bromophenol is exposed to a mixture of nitric acid and sulfuric acid, nitration occurs at the:

1. 2 position
2. 3 position
3. 4 position

C. Positive charge is delocalized over which positions of an allylic carbocation?

1. C1 and C2
2. C1 and C3
3. C1 and C4
4. C1, C3 and C5

D. When unsymmetrical epoxides are exposed to acidic reagents, ring opening occurs:

1. at the less hindered position
2. at the more hindered position
3. at both of the above positions, with no selectivity

E. Which ether forms a hydroperoxide readily?

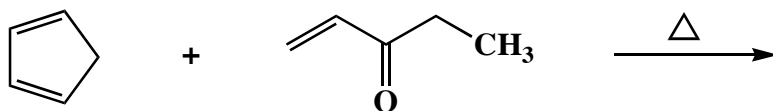
1. *i*PrOEt
2. PhOPh
3. *t*-BuOMe

Name: _____

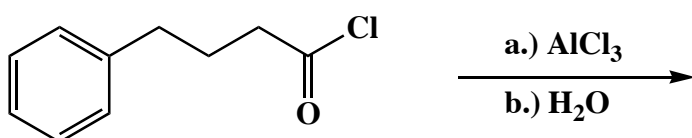
2. (25 points)

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

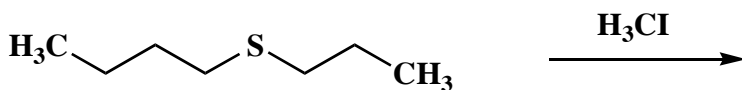
A.



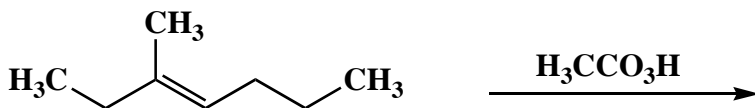
B.



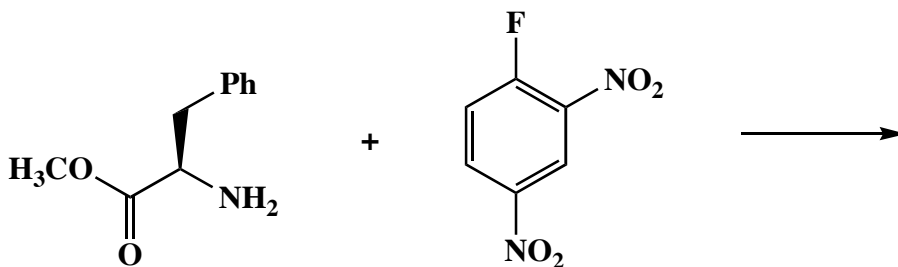
C.



D.



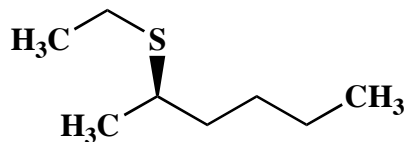
E.



Name: _____

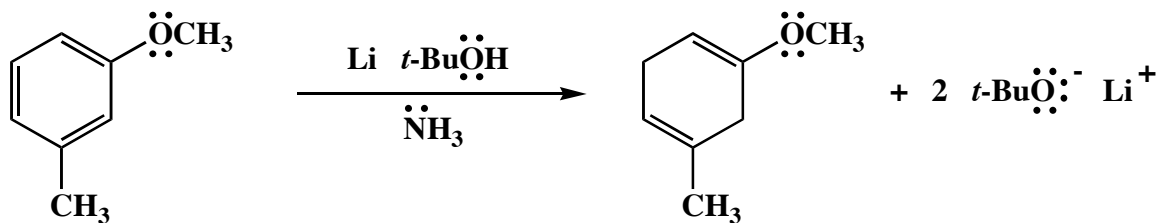
3. (10 points)

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



4. (20 points)

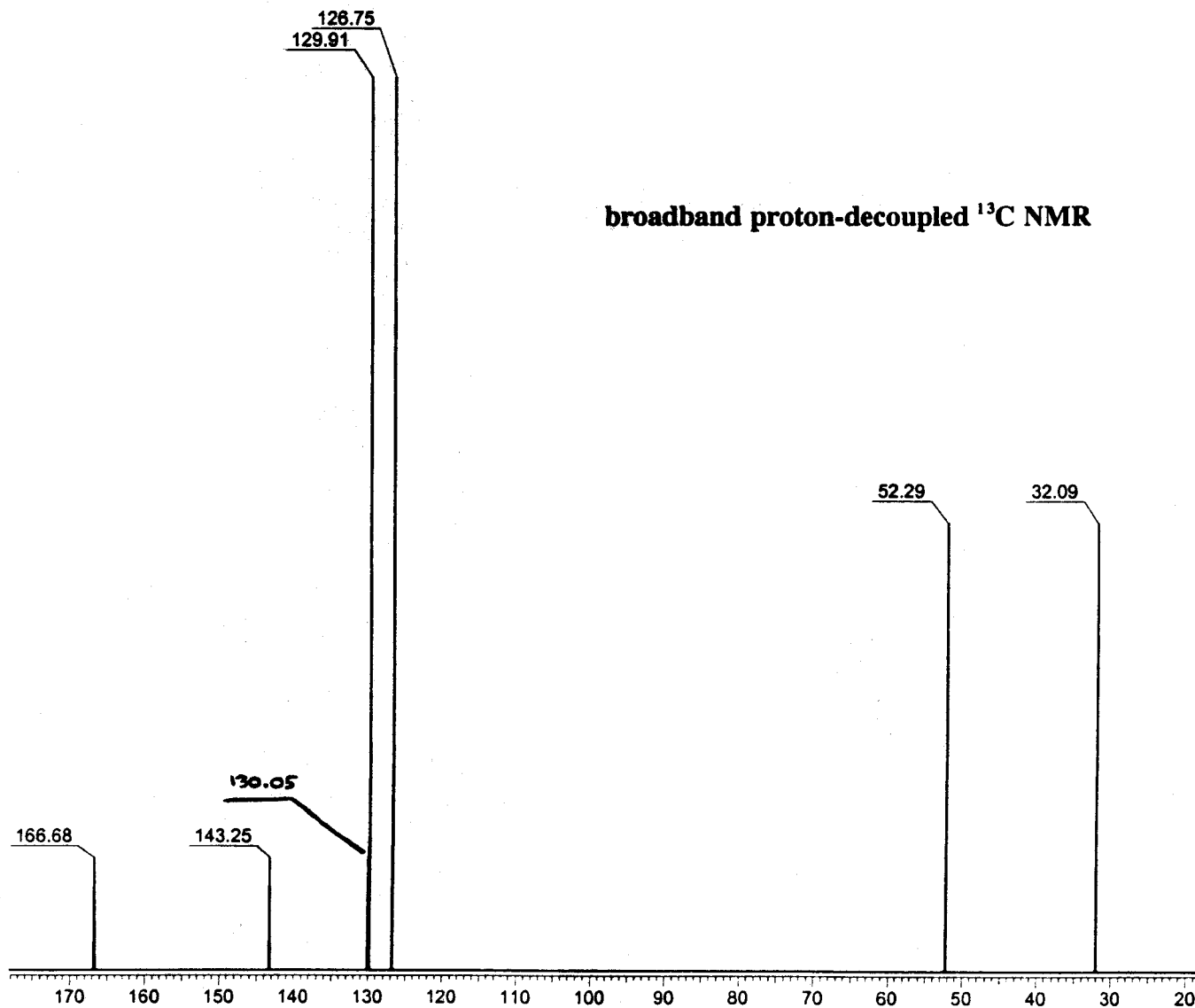
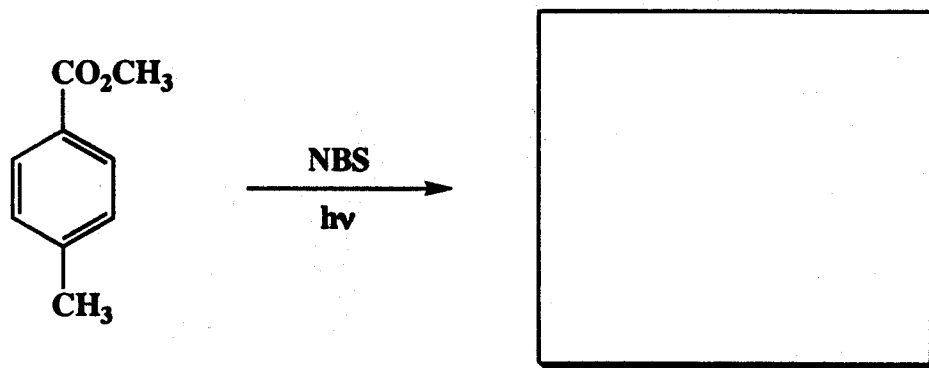
Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Show all intermediates and denote all unshared electrons, formal charges and countercharges where appropriate. (Note: All reagents are present in excess.)



Name: _____

5. (20 points)

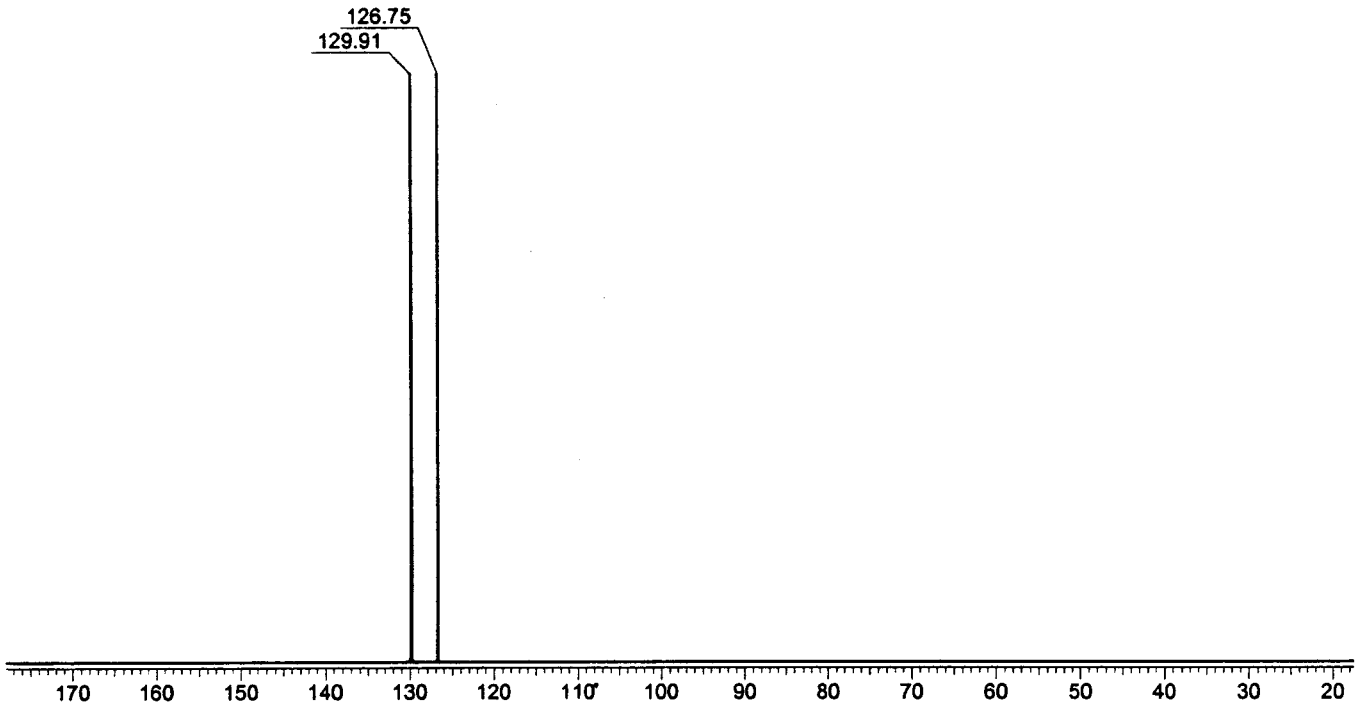
Draw the major organic product that is formed from the following reaction. The broadband proton-decoupled ^{13}C NMR, DEPT 90 and DEPT 135 spectra of the product are shown below. Use the spectroscopic data to identify this compound. Make clear assignments of all resonances to explain your reasoning. (A ^{13}C NMR correlation table is included on page 8.)



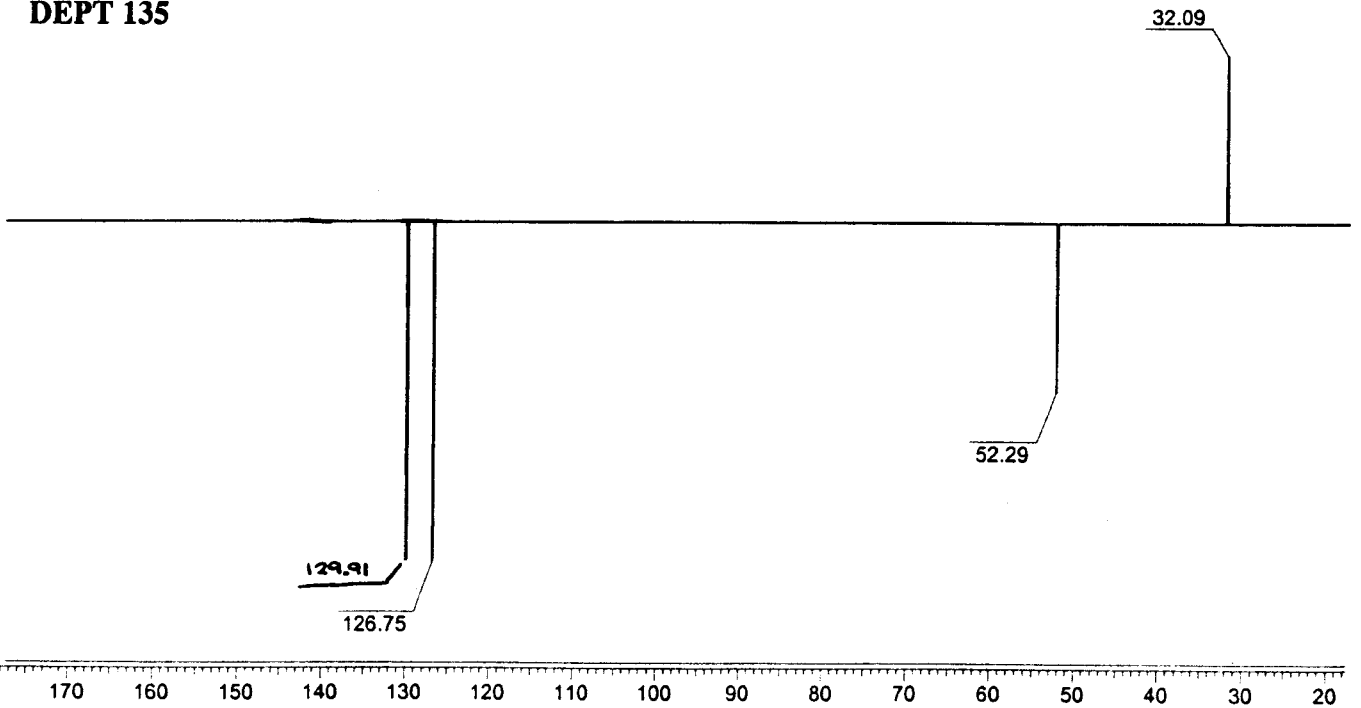
Name: _____

5. (continued)

DEPT 90



DEPT 135



Name: _____

5. (continued)

^{13}C NMR assignments:

chemical shift	assignment	DEPT 90 appearance	DEPT 135 appearance
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Congratulations!

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