

Chemistry 334

Examination #1

September 30, 2009

Professor Charonnat

Name: _____

Be certain that your examination has seven (7) 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.

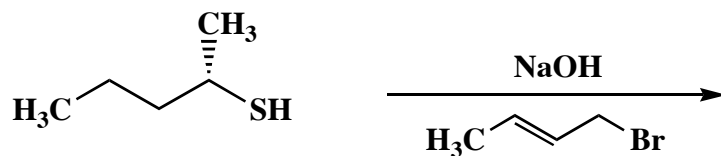
Molecular models are allowed for this examination. All electronic devices, including calculators, are unnecessary and are not allowed.

Name: _____

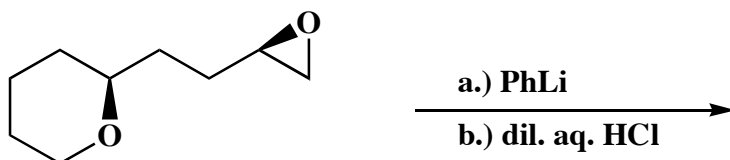
1. (25 points)

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

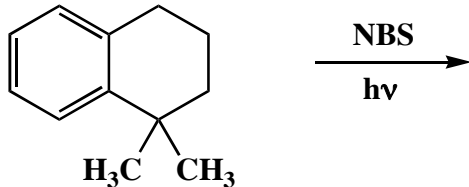
A.



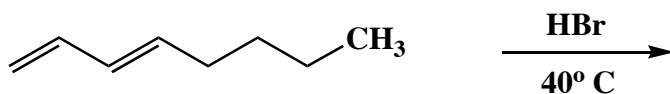
B.



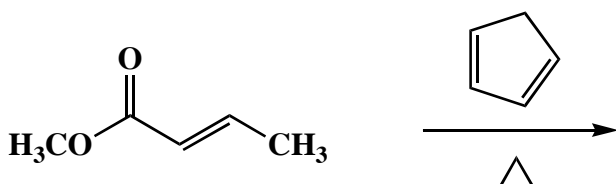
C.



D.



E.

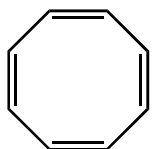


Name: _____

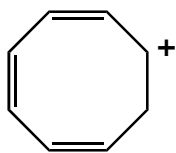
2. (25 points)

Classify each of the following five (5) species as aromatic, antiaromatic, or nonaromatic (neither aromatic nor antiaromatic).

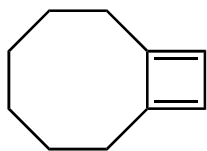
A.



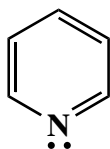
B.



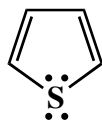
C.



D.

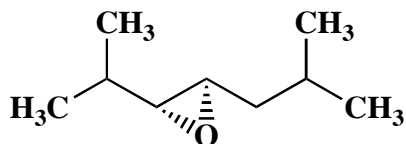


E.



3. (10 points)

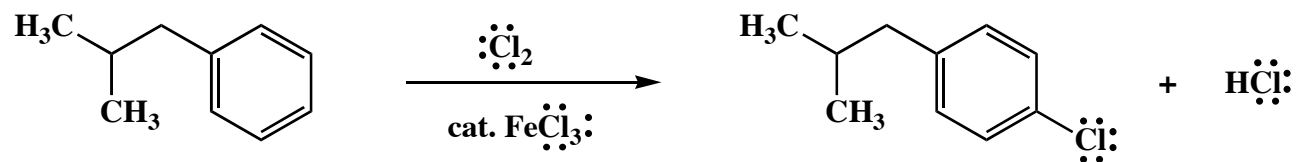
Use IUPAC nomenclature to write the systematic name of the following epoxide.



Name: _____

4. (20 points)

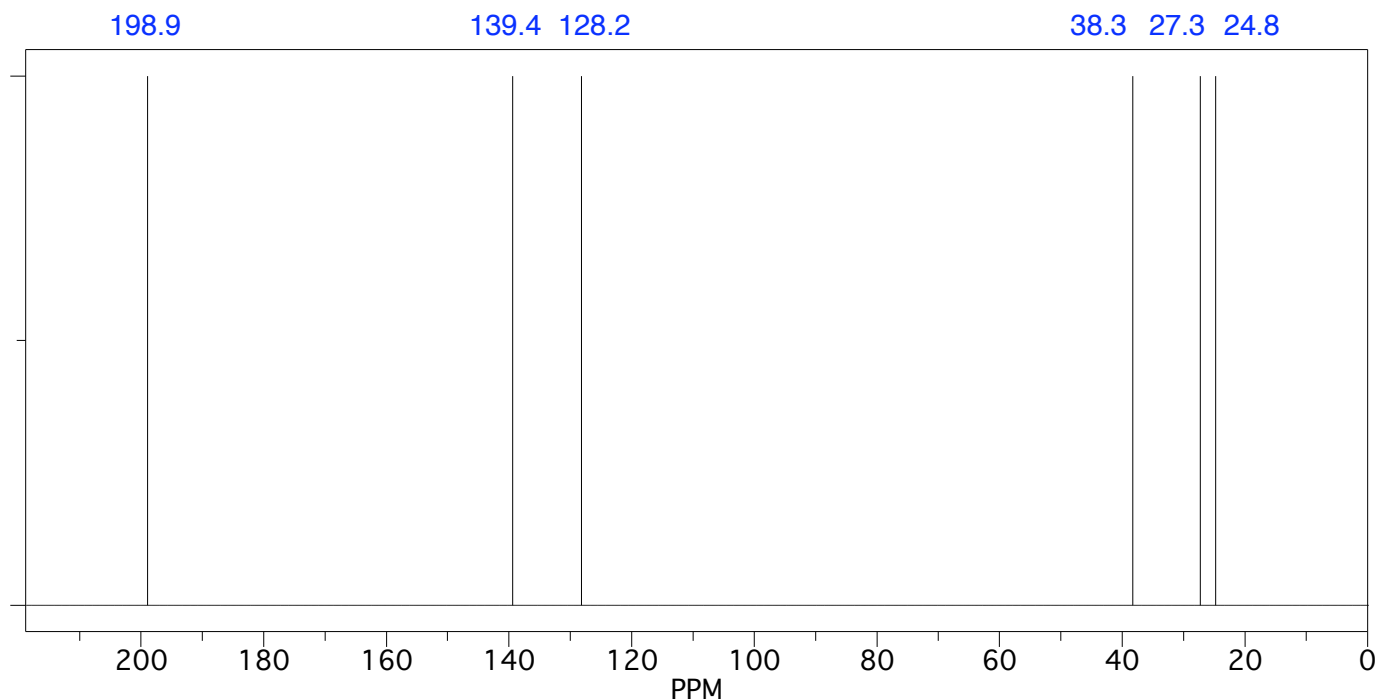
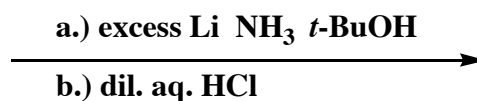
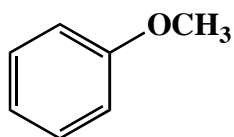
Draw the mechanism of the following reaction, using the curved-arrow notation to indicate the reorganization of electron density. Denote **all** intermediates, lone pairs, nonzero formal charges, countercharges, and reversibility or nonreversibility. Draw all important resonance contributors for intermediates.



Name: _____

5. (20 points)

Draw the structure of the expected major organic product of the following reaction. The broadband proton-decoupled ^{13}C NMR spectrum of this product is shown below. Use the spectroscopic data to identify the product. Make clear assignments of all resonances to explain your reasoning. (A ^{13}C NMR correlation table is included on page 7.)



Name: _____

5. (continued)

^{13}C NMR assignments:

chemical shift (ppm) assignment

198.9

139.4

128.2

38.3

27.3

24.8

Congratulations!

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