

Chemistry 334

Examination #1

October 5, 1998

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.

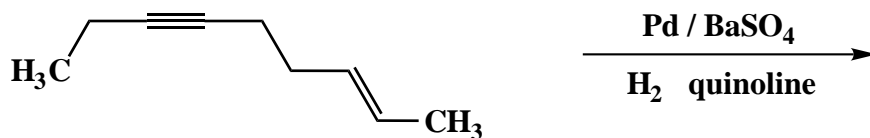
By putting your name on this examination booklet you agree to abide by California State University, Northridge policies of academic honesty and integrity.

Name: \_\_\_\_\_

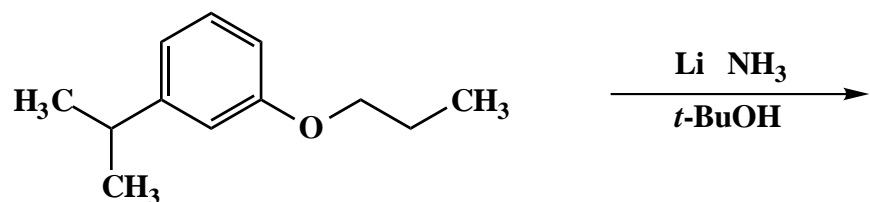
1. (25 points)

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

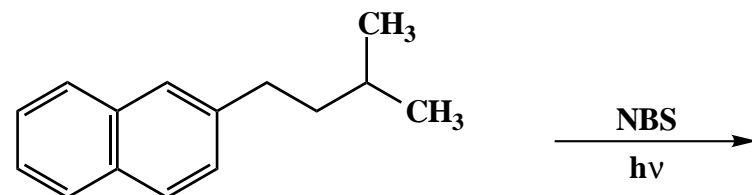
A.



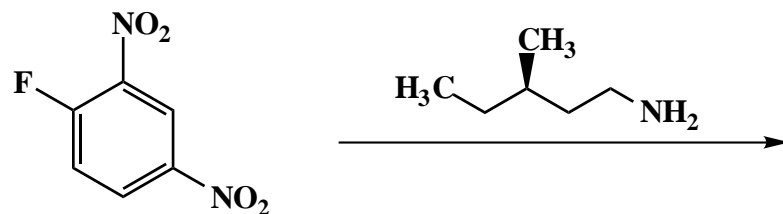
B.



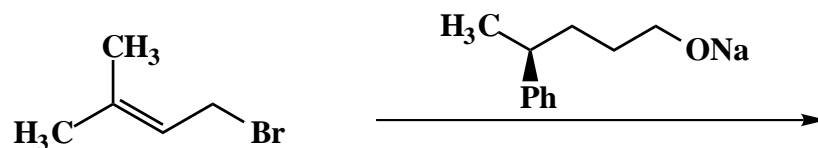
C.



D.



E.



Name: \_\_\_\_\_

2. (20 points)

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

A. Ultraviolet spectra are not composed of extremely sharp absorptions due to:

1. the Heisenberg uncertainty principle
2. transitions from different vibrational and rotational sublevels
3. background noise from the uv spectrometer

B. An *s*-cis (cisoid) diene conformation is required for the Diels-Alder reaction due to:

1. it being the least stable conformation
2. required orbital overlap in the cyclic transition state
3. decreased repulsive steric interactions

C. The allyl carbocation contains:

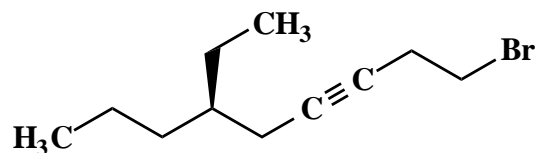
1. two carbon-carbon double bonds
2. one carbon-carbon single bond and one carbon-carbon double bond
3. two carbon-carbon bonds each with one-and-a-half bond order

D. Cyclobutadiene is:

1. aromatic
2. antiaromatic
3. neither of the above

3. (10 points)

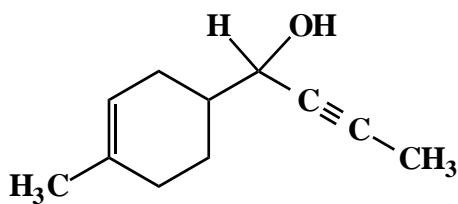
Use IUPAC nomenclature to write the systematic name of the following internal alkyne.



Name: \_\_\_\_\_

4. (20 points)

Design a synthesis of the secondary alcohol **1** from allyl alcohol ( $\text{H}_2\text{C}=\text{CHCH}_2\text{OH}$ ), acetylene ( $\text{HC}\equiv\text{CH}$ ) and any additional necessary reagents. Show all reagents and stable synthetic intermediate compounds. (N.B. Do not draw mechanisms for each synthetic transformation!)

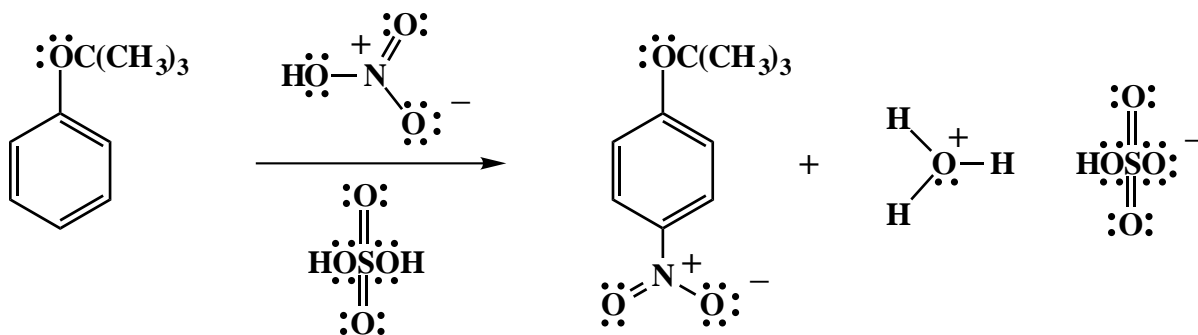


(mixture of diastereomers)

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, countercharges and resonance structures where appropriate.



**Congratulations!**

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