Chemistry 118 B
Spring 2010
Second Midterm
Fri. May 21st , 2010
Instructor: Lievens

This exam contains seven (7) pages and nine (9) problems. Please make sure that your copy contains all seven pages. If there is a problem, please tell the exam administrator prior to beginning. Please answer all questions. Remember that UCDavis Code of Academic Conduct applies to this exam and all other graded work in this class.

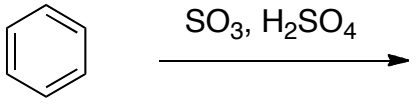
Name: _____
Last First MI

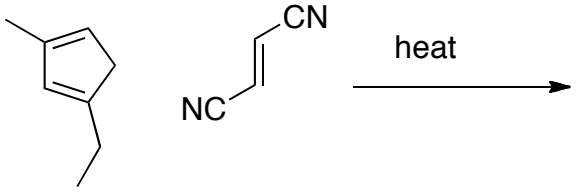
Student ID. # _____

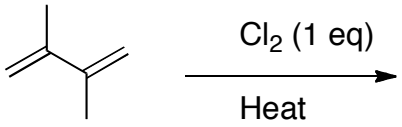
T.A./ Lab Section: _____

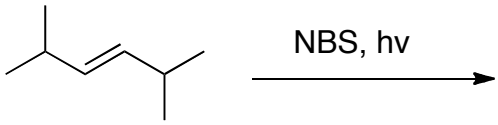
Page #	Points
2	
3	
4	
5	
6	
7	
Total (115)	

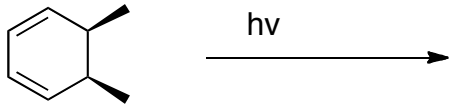
1. **Reactions:** (32 pts). Draw the structure of the expected organic product(s) formed in the following reactions *including correct stereochemistry.* Assume all reagents listed are present in *excess* unless otherwise noted. If no reaction occurs, state 'No Reaction'.

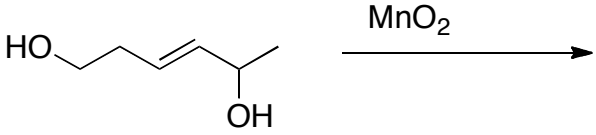
A) 

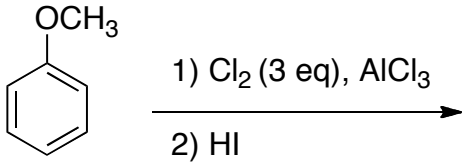
B) 

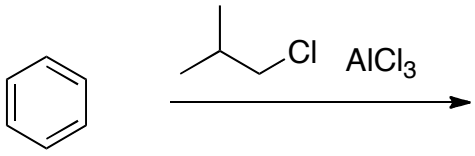
C) 

D) 

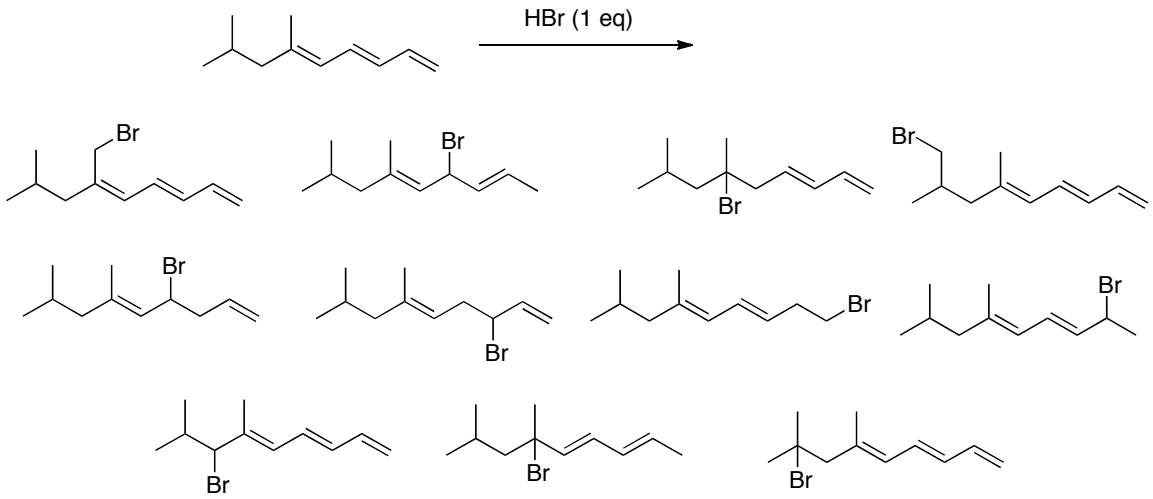
E) 

F) 

G) 

H) 

2. **Reactions:** (5 pts). Circle the compounds that are likely products of this reaction. Of these label which would be the major product under *thermodynamic* conditions and which would be the major product under *kinetic* conditions.



3. Vocabulary: (14 pts) Fill in the blanks with the appropriate vocabulary word. If two bold words are given circle the correct one.

A) A **$-NH_2$ / $-OCH_3$ / $-CH_3$ / -Cl** is a mild activator by induction.

B) An ortho/para director is **always / sometimes / never** and activating group.

C) **True / False** A Diels Alder reaction works by a stepwise mechanism with intermediate ions.

D) **True / False** Light can close a triene to a cyclohexadiene and does so in a disrotory manner.

E) A **$-CF_3$ / $-NO_2$ / –CN / -COR** is the most deactivating, all these functional groups are _____ directors

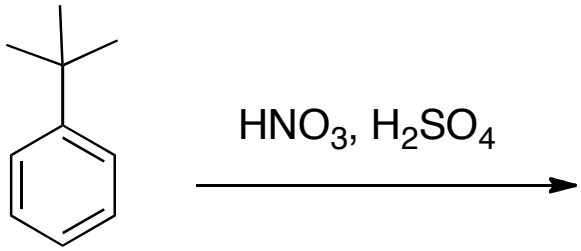
F) Conjugated systems are **more / less** stable than unconjugated systems and are also **more / less** reactive than unconjugated system.

G) Aromatic systems must be _____, _____, _____ and have _____ pi electrons.

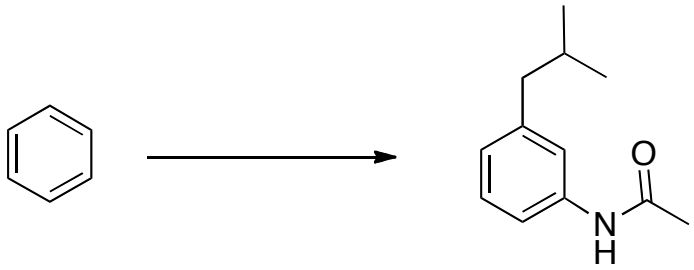
H) Natural rubber is a polymer of isoprene that is elastic due to _____.

I) **True / False**. Benzene undergoes reactions similar to other alkenes.

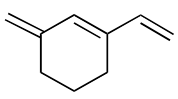
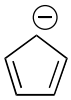
4. **Mechanism:** (12 pts.). Show detailed reaction mechanisms for the following reaction. Include all relevant resonance structures and the structure of the expected products.



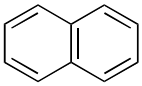
5. **Synthesis:** (14 pts) Show how you would carry out the following synthesis. Include the reagents you would need for each step and the structure of the intermediate products formed in each step.



6. **Identification:** (6 pts) Label each compound as aromatic, non-aromatic, or anti aromatic.

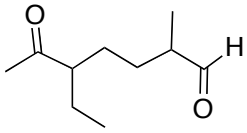



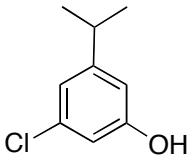

_____ _____ _____

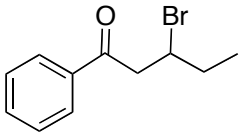


_____ _____ _____

7. **Nomenclature:** (8pts.) Provide the systematic names or structure of each of the following compounds include E/Z where relevant.

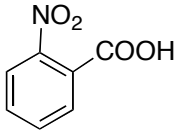
A) 

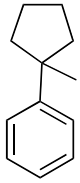
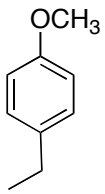
B) 

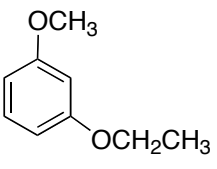
C) 

D) m-butyl-nitrobenzene

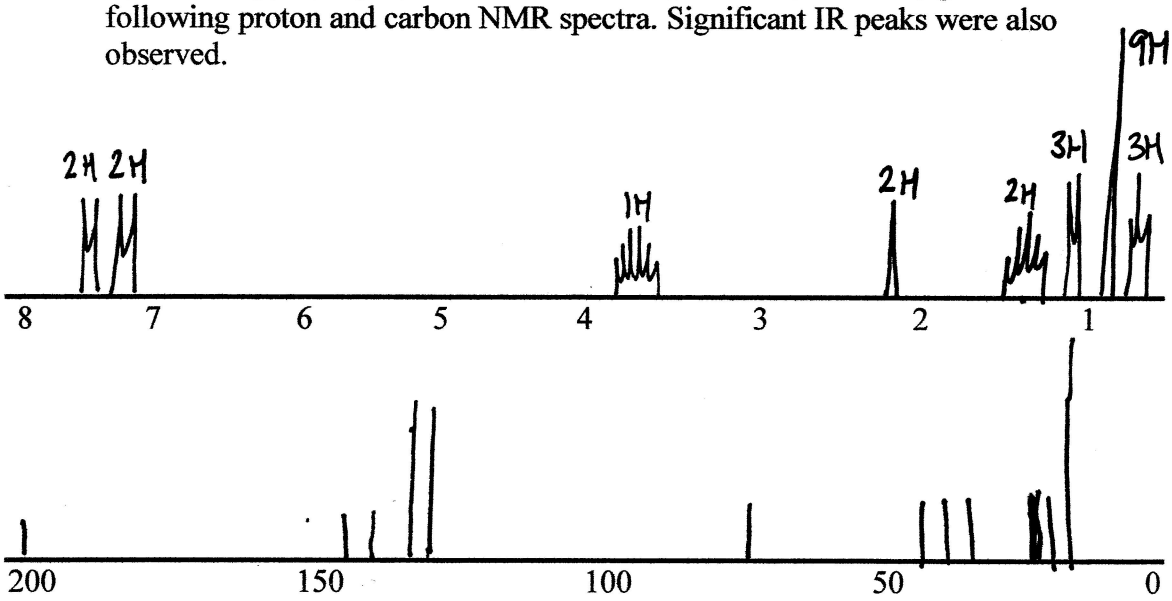
8. **Reactivity:** (4 pts) Circle the carbon(s) on each molecule that is/are most likely to be substituted in an electrophilic aromatic substitution.





9. **Spectroscopy:** (20 pts.) The unknown compound **A** ($C_{16}H_{24}O_2$) gives the following proton and carbon NMR spectra. Significant IR peaks were also observed.



IR: 3036, 2955, 1690, 1210, 810, and fingerprint cm^{-1}.