

Exam 1
February 1, 2013
Organic Chemistry 335

Please do not open the exam until it begins.

This exam is 65 minutes long (9-10:05). I will post a key on D2L today. There will be no make-up exams. Please be considerate of your fellow classmates when leaving. Don't stand by the doors and discuss the exam.

All cell phones and personal audio devices must be turned off and put away. The use of calculators, notes, the text book, or **your neighbor's test** is not permitted during the exam. You may use molecular models but they can not be shared during the exam.

I will not accept answers on scratch paper. All answers must be on the exam.

Please put your in-class number and your name on the second page **and** the back of the exam.

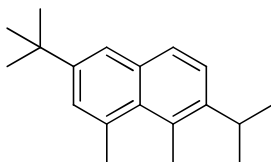
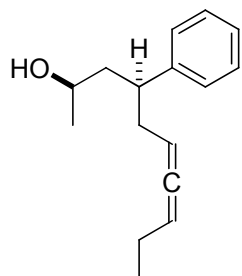
Good Luck!!!!

CH 335 Exam 1
January 31, 2012

In-Class # _____

Name _____
(Last, First)

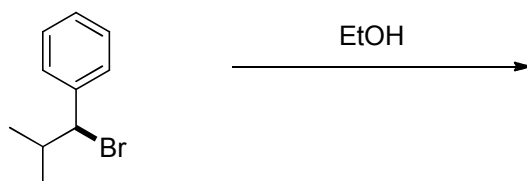
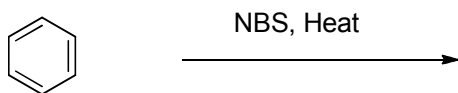
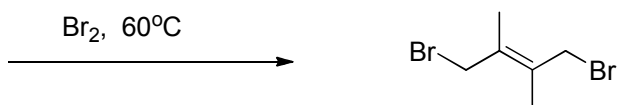
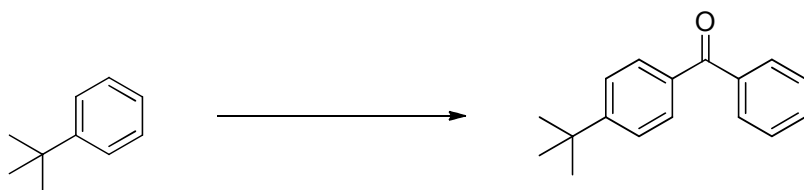
1. Name the following two compounds. (10 pts)



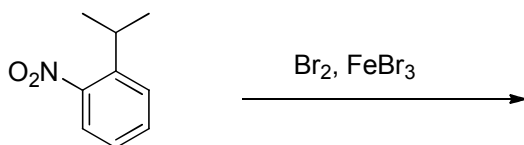
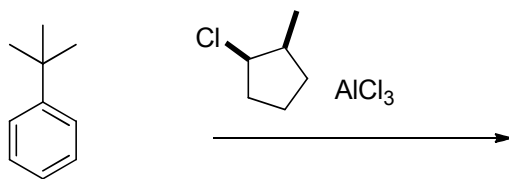
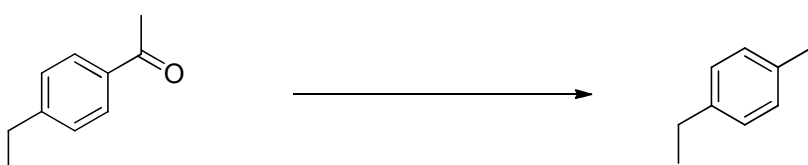
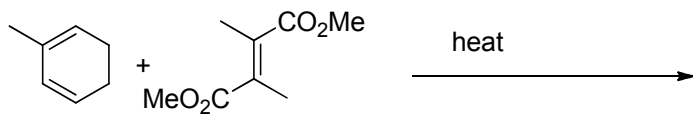
2. Draw 5-acetyl-2-bromo-3-hydroxybenzoic acid in bond line. (4 pts)

3. What are the starting material, reagents, or major product/s for the following reactions? If there is no reaction write No Reaction. (32 pts)

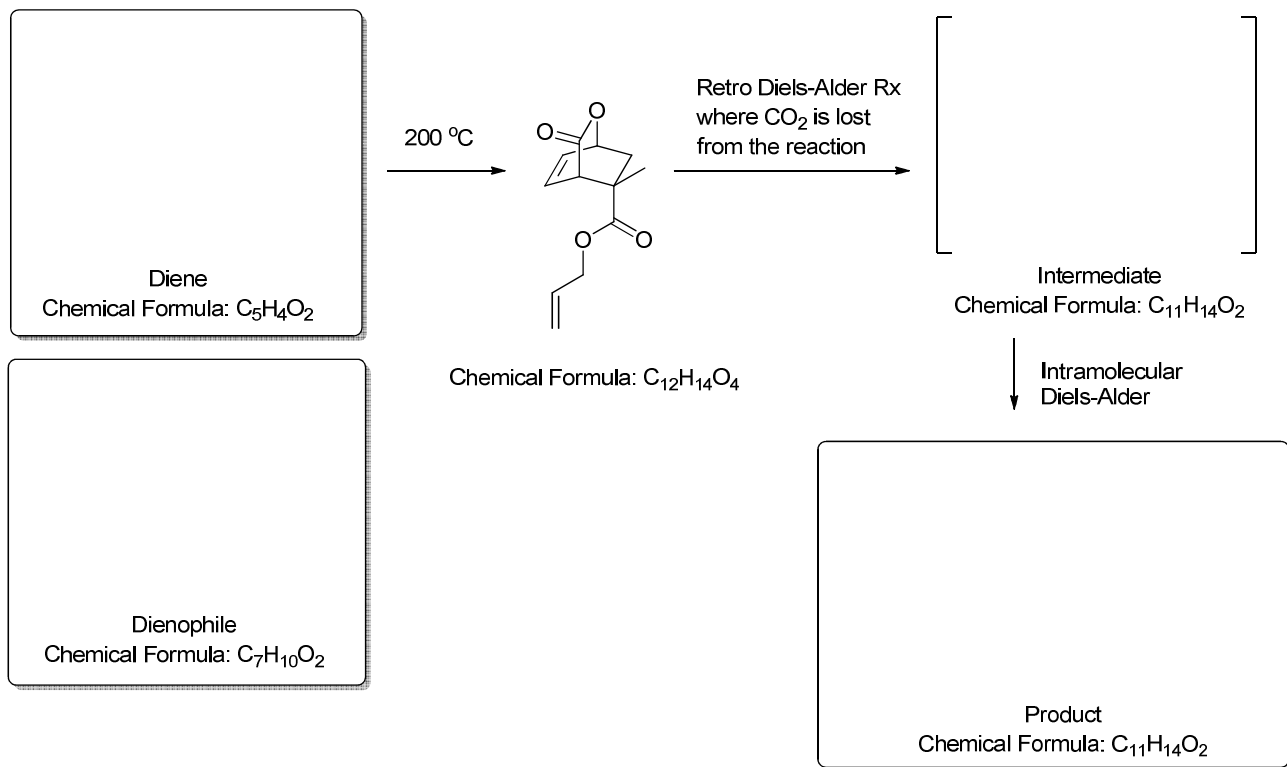
Don't forget about stereochemistry.



Problem 3 Continued

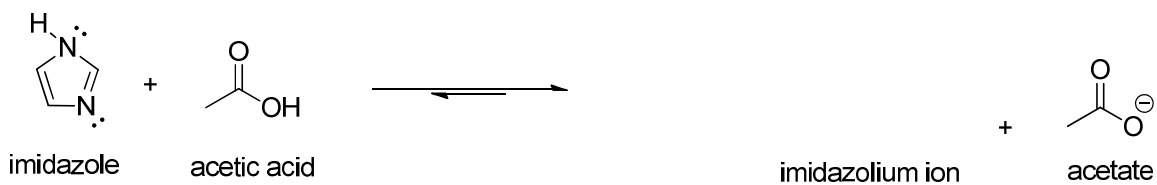


4. A timed Diels-Alder reaction is when each step relies on the completion of the previous step. Please draw the diene, the dienophile, the intermediate, and the product for the following timed Diels-Alder reaction sequence. (10 points)



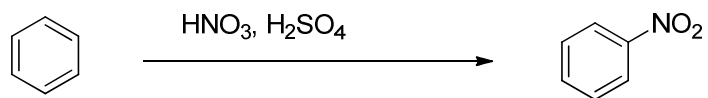
5. When imidazole is treated with acetic acid, only one nitrogen is protonated.

a. Draw the structure of the imidazolium ion. (2 pts)

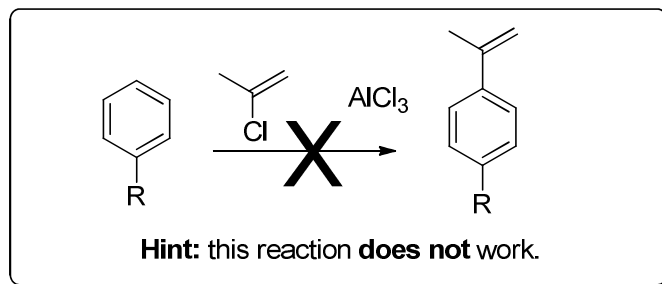
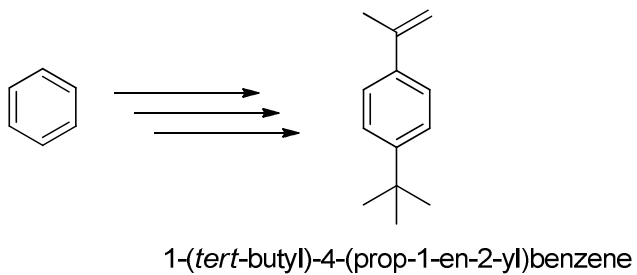


b. Briefly explain why one nitrogen atom is protonated over the other in imidazole. Remember, a picture is worth a thousand words. ☺ (4 pts)

6. Draw the complete mechanism for the following reaction. (15 pts)

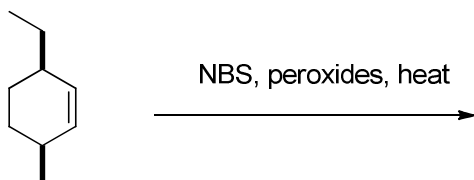


7. Design a synthesis of 1-(tert-butyl)-4-(prop-1-en-2-yl)benzene starting from benzene. You may use any reagents you have learned. You must show the reagents and product from the reactions. (11 pts)



8. Provide a short explanation why an electron withdrawing group **does not** direct *ortho* or *para* in an electrophilic substitution reaction. Please draw the appropriate resonance structures to support your explanation. (8 pts)

9. Draw all the possible allylic bromide species (monobrominated) that could be produced from the radical bromination of (3*R*,6*S*)-3-ethyl-6-methylcyclohex-1-ene. Don't forget about stereochemistry. (4 pts)



(3*R*,6*S*)-3-ethyl-6-methylcyclohex-1-ene

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*****Insurance Question (5 pts) *****

Provide the mechanism of how 1-methyl-3-phenyl-2,3-dihydro-1H-indene is produced from two equivalents of styrene in the presence of sulfuric acid. Do not worry about stereochemistry.

