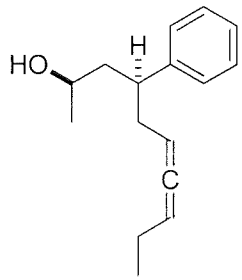
CH 335 Exam 1
January 31, 2012

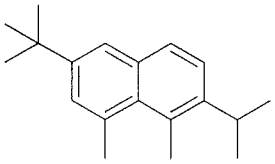
In-Class # Key

Name _____
(Last, First)

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

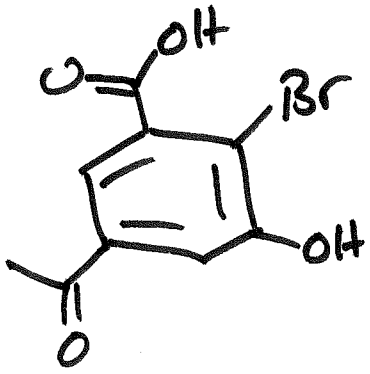


(2*R*,4*S*)-4-phenyldeca-6,7-dien-2-ol



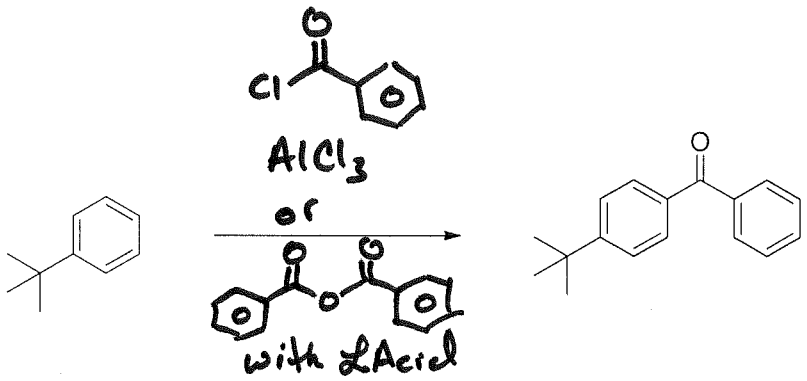
6-(*tert*-butyl)-2-isopropyl-1,8-dimethylnaphthalene

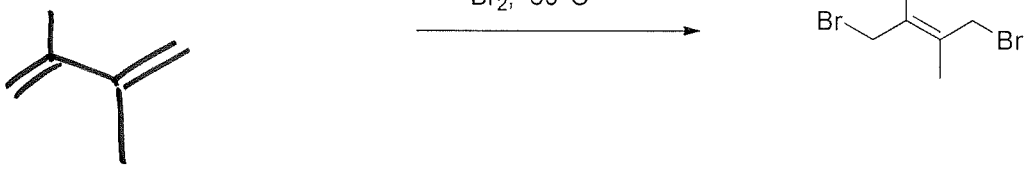
2. Draw 5-acetyl-2-bromo-3-hydroxybenzoic acid in bond line. (4 pts)

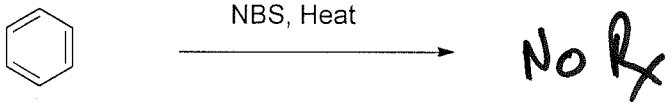


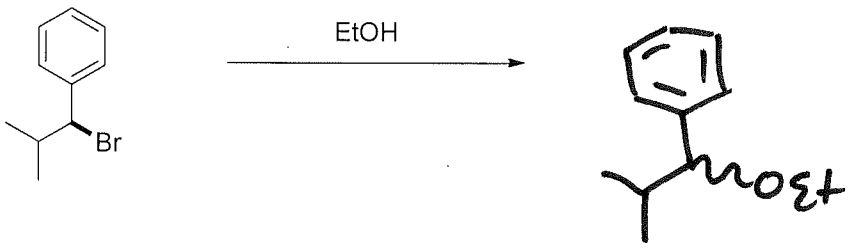
3. What are the starting material, reagents, or major product/s for the following reactions? If there is no reaction write No Reaction. (32 pts)

Don't forget about stereochemistry.

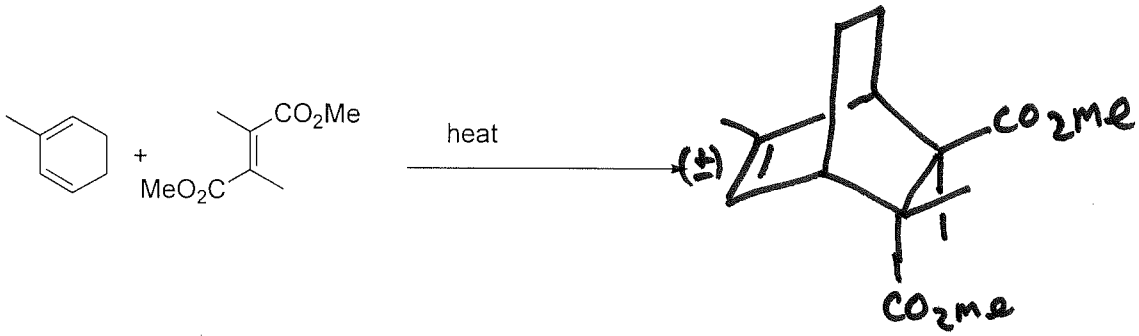


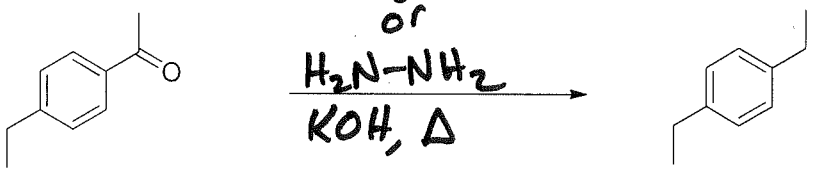


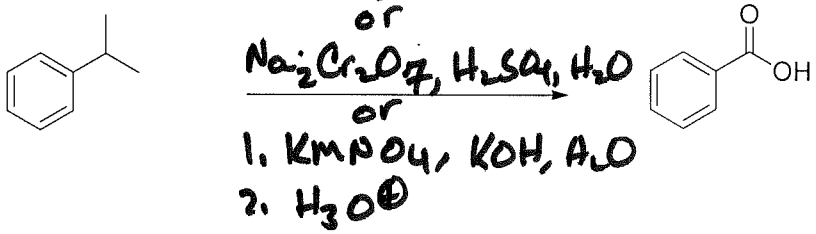


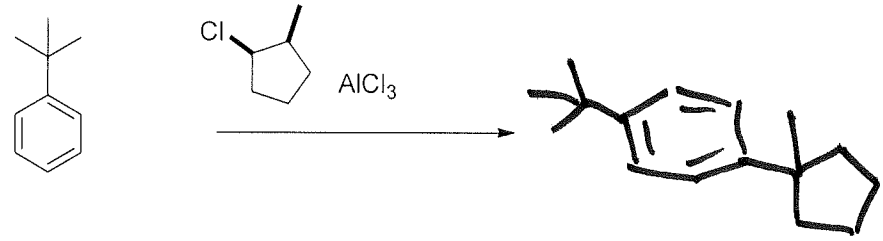


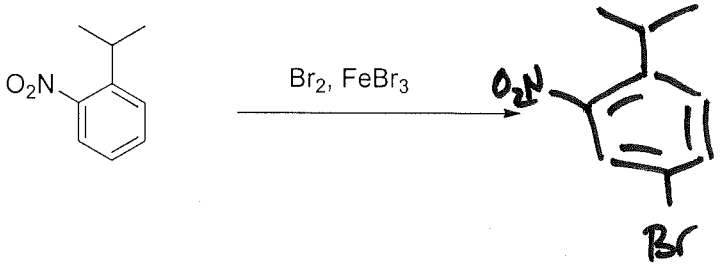
Problem 3 Continued



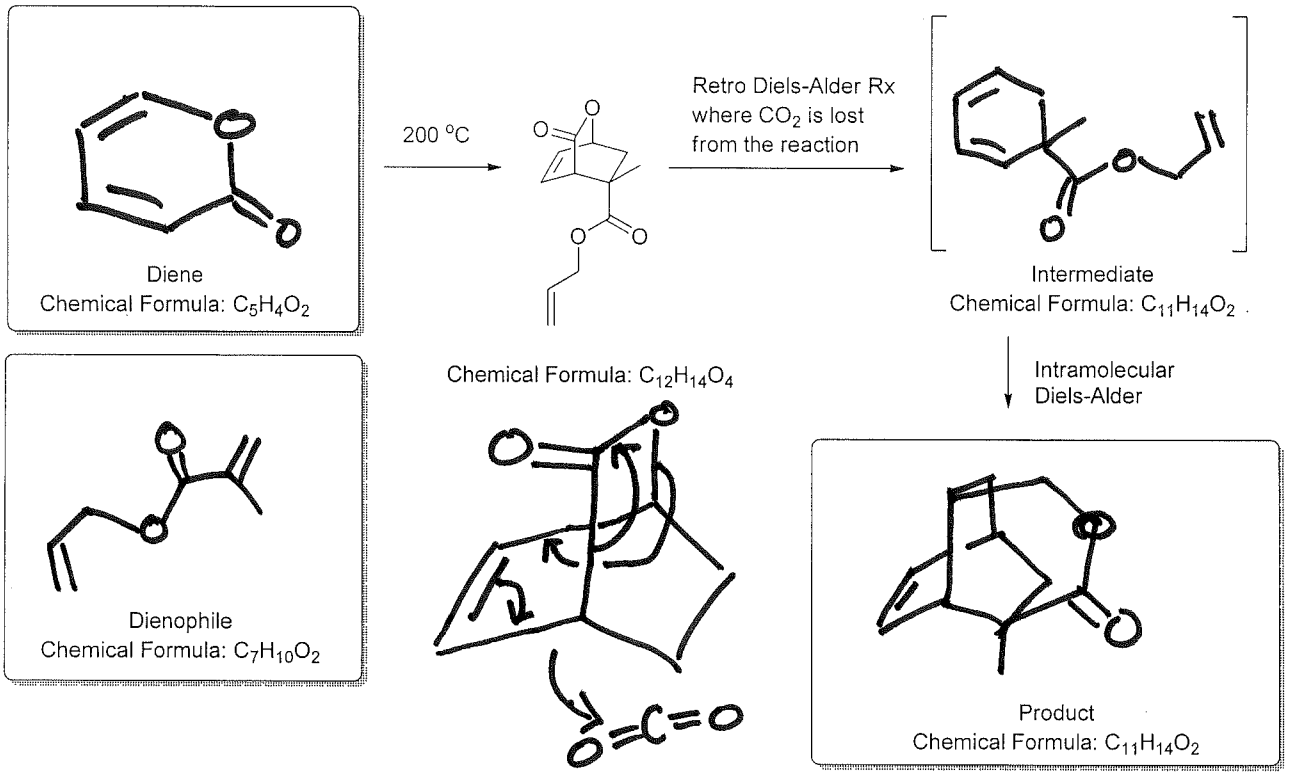






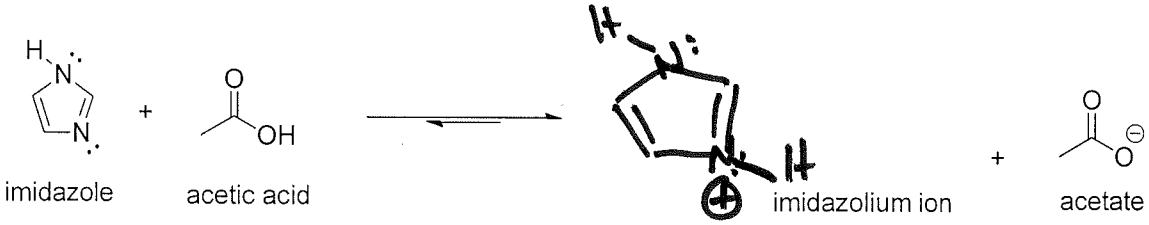


4. A timed Diels-Alder reaction is when each step relies on the completion of the previous step. Please draw the diene, the dienophile, the intermediate, and the product for the following timed Diels-Alder reaction sequence. (10 points)



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 imadizole. Remember, a picture is worth a thousand words. ☺ (4 pts)

if this N is protonated the compound looses Aromaticity Bad

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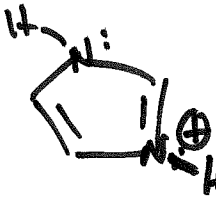
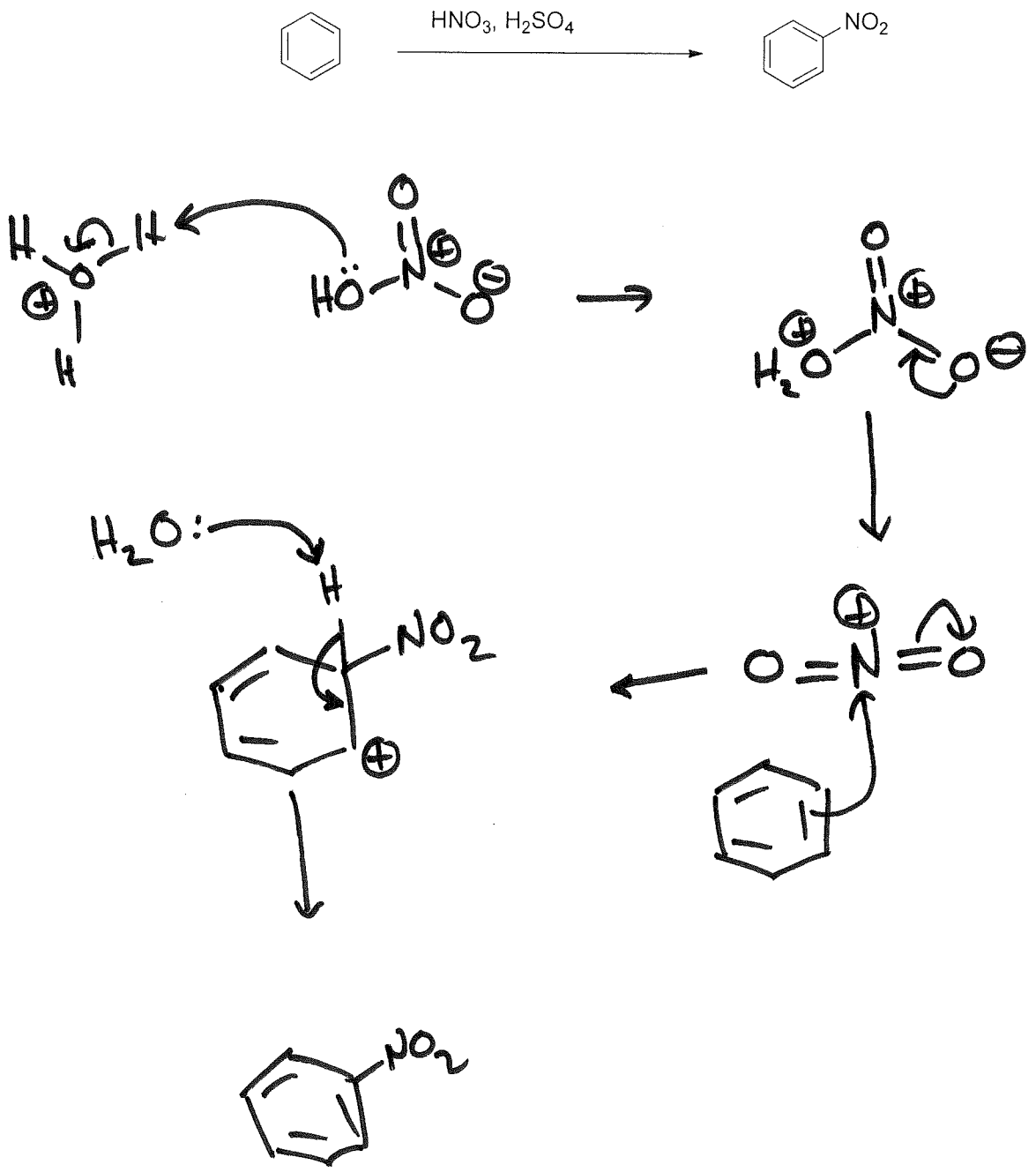
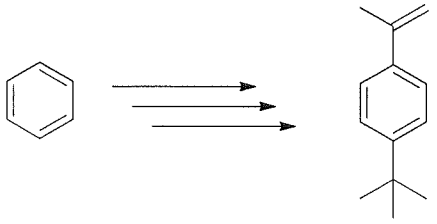


← if this N is protonated the compound is still aromatic

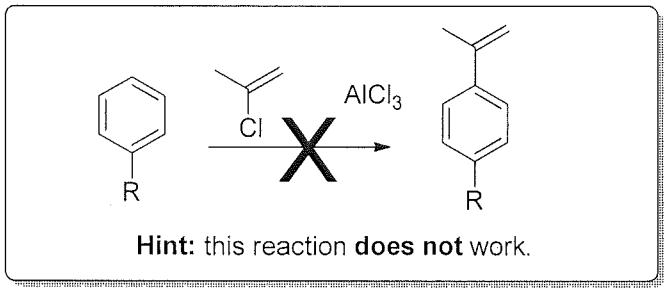
6. Draw the complete mechanism for the following reaction. (15 pts)



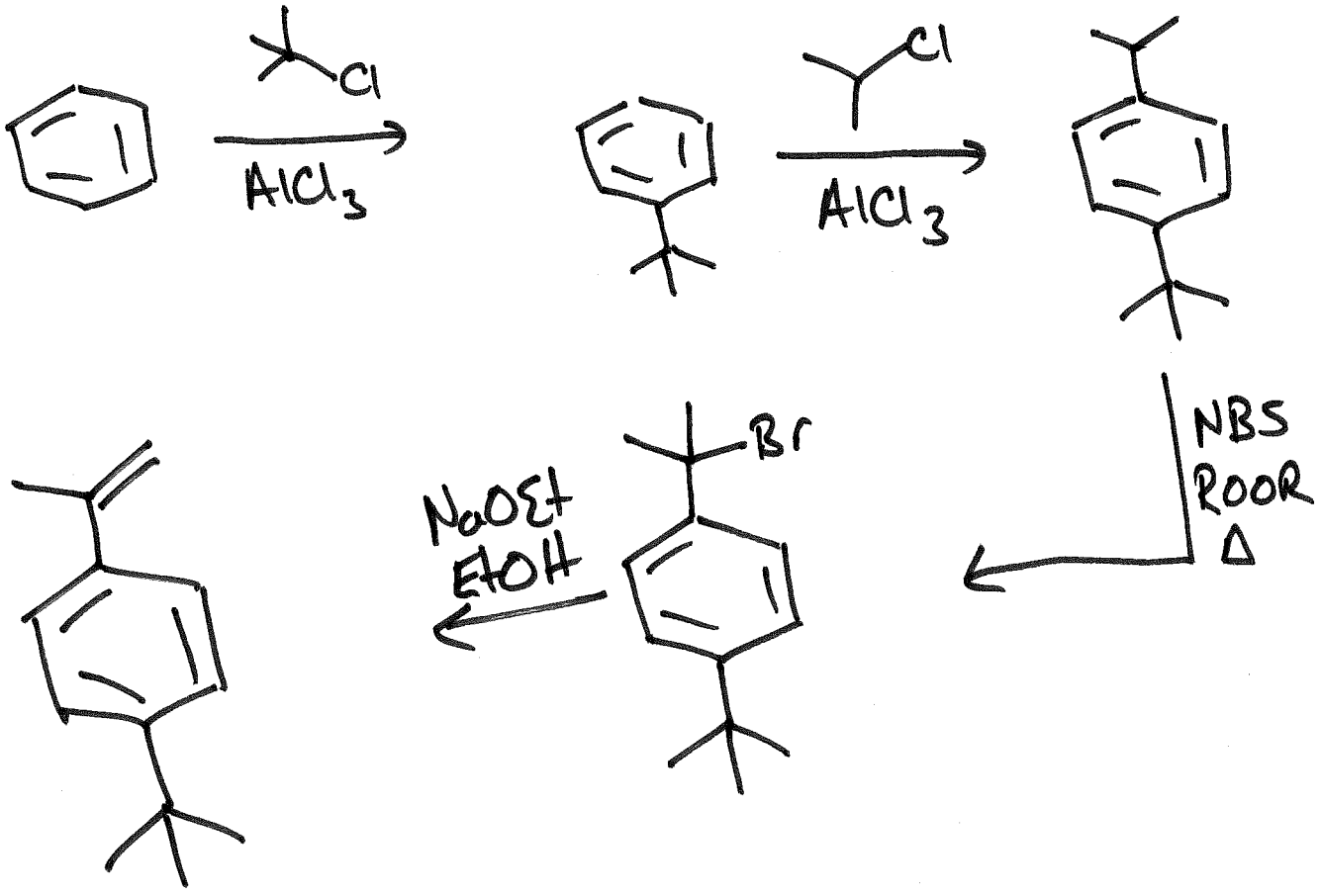
7. Design a synthesis of 1-(tert-butyl)-4-(prop-1-en-2-yl)benzene staring from benzene. You may use any reagents you have learned. You must show the reagents and product from the reactions. (11 pts)



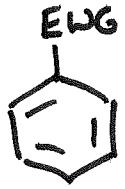
1-(*tert*-butyl)-4-(prop-1-en-2-yl)benzene



Hint: this reaction **does not** work.

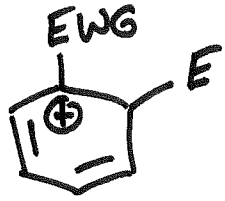


8. Provide a short explanation why an electron withdrawing group **does not** direct *ortho* or *para* in an electrophilic substitution reaction. Please draw the appropriate resonance structures to support your explanation. (8 pts)

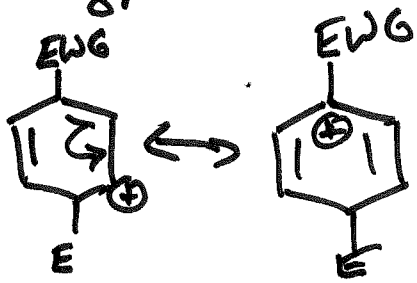


← EWG have a δ+ or ⊕ charge

so



or



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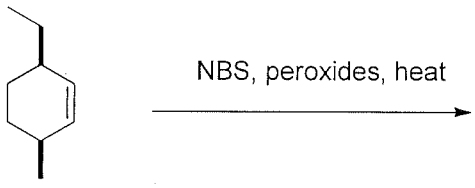
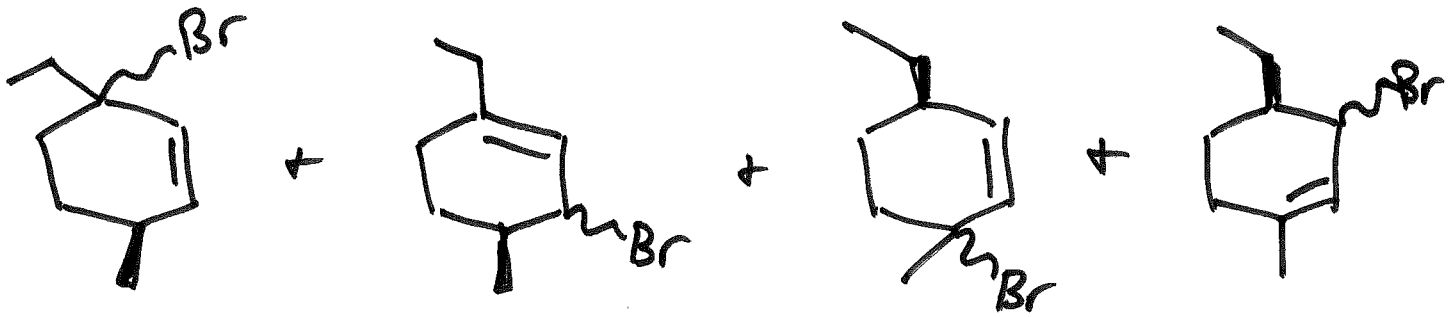
if the Electrophile (E) ends up ortho or para we can have the carbocation next to the δ+ or ⊕ EWG.

⊕ next to ⊕ or δ+ high in Energy.

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



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



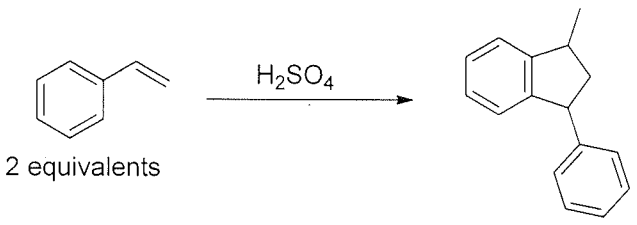
CH 335 Exam 1
Feb 1, 2013

In-Class # _____

Name _____
(Last, First)

**********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.



2 equivalents

1-methyl-3-phenyl-2,3-dihydro-1H-indene