

Exam 1--Blizzard
Organic Chemistry II C3444
Prof. Nuckolls
February 24, 2003

- Write your name on every page.
 - You should have 5 pages including this one.
 - Turn off your cellular phones.
 - Do your own work.
 - Good Luck!

Name: _____

Columbia I.D. #: _____

Signature: _____

Grading:

#1	/12
#2	/12
#3	/12
#4	/12
#5	/12
#6	/12

Section 1 _____ **/72 points**

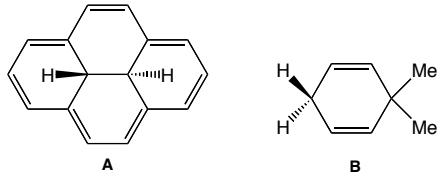
Section 2 _____ **/28 points**

Total _____ **/100 points**

Name:

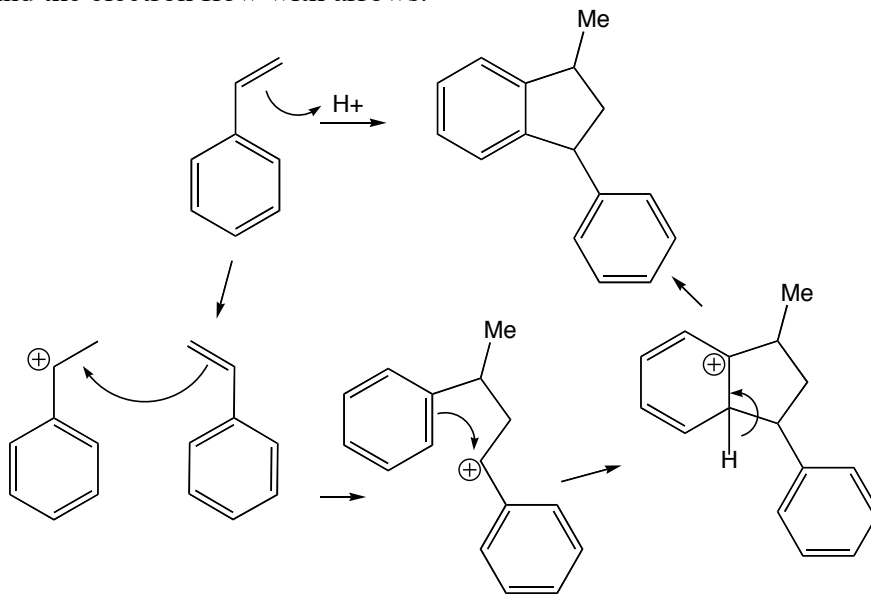
Section 1. Answer the following questions in the space provided. (12 points each, 72 points total)

1. Consider the proton NMR spectrum for the protons drawn in structure **A** below. Are these proton NMR resonances at higher or lower magnetic field than those protons shown in **B**? Explain your answer in two sentences or less.



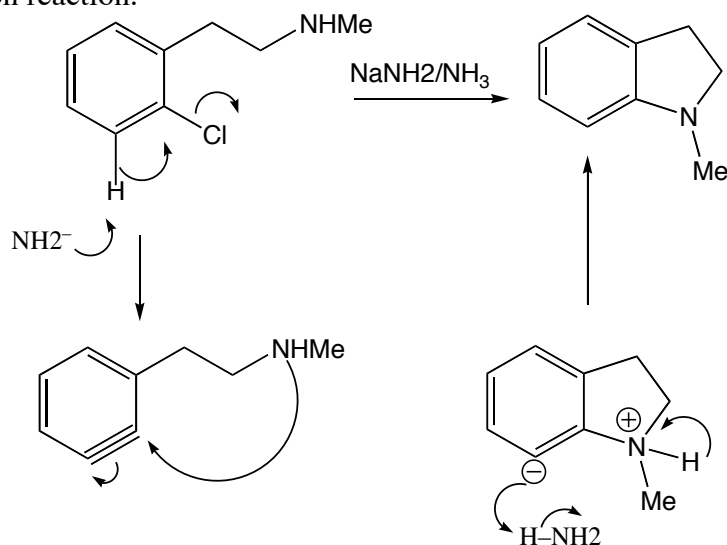
See question two from the other exam.

2. Write a mechanism that accounts for the following transformation. Clearly show each intermediate and the electron flow with arrows.

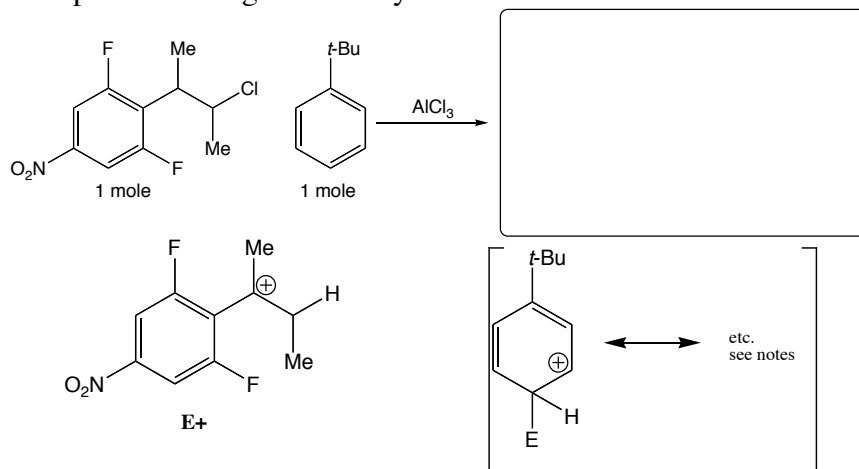


Name:

3. Write a mechanism that clearly shows the electron flow with arrows that accounts for the following cyclization reaction.

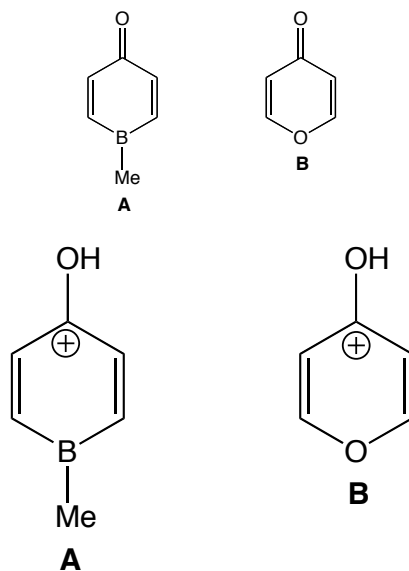


4. Draw the product of the following reaction in the box. Below the reaction, draw (1) the electrophile that is generated by reaction with the Lewis acid and (2) all resonance forms for the arenium cation that predict the regiochemistry of the reaction.



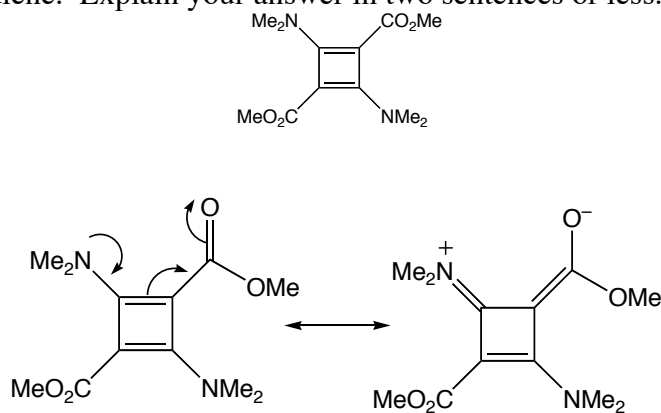
Name:

5. Which compound is more basic? Explain your choice and draw key resonance structures as support.



the protonate form of A has 4π electrons and for B has 6π electrons. Therefore B is more basic due to the aromaticity associated with its protonated resonance form and the antiaromaticity of the protonated form of A.

6. Draw a resonance structure for the following compound that pushes π -electrons from the amine to the ester. Predict, based on this structure, whether the compound below is more or less stable than cyclobutadiene. Explain your answer in two sentences or less.



By using the resonance form above the electrons can be pushed out of the ring and therefore stabilized relative to cyclobutadiene which cannot do this..

Name:

Section 2. Show the steps (and the intermediate products) you would use to synthesize the target molecule from the starting materials given. You do not need to write out the mechanisms. Your synthesis should involve the creation of two intermediate structures derived from benzene that are then coupled together. (28 points)

