Organic Chemistry c3444y

1st Hour Exam

Monday, Feb. 5, 2001
Prof. Leighton

Name:_____ **ID#**_____

Signature:_____

- Write your name on every page.
- The exam is 5 pages long (*not* including this one). Please make sure you have all of the pages.
- Write complete ***but succinct*** answers. **Good Luck!**

Question 1 (20 pts): _____

Question 2 (20 pts): _____

Question 3 (20 pts): _____

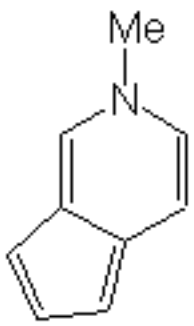
Question 4 (20 pts): _____

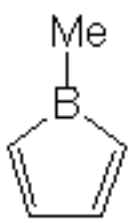
Question 5 (20 pts): _____

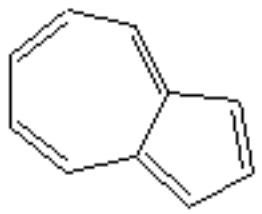
Total (100 pts):_____

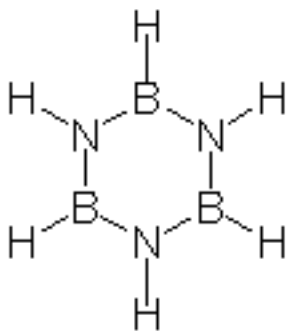
Name: _____

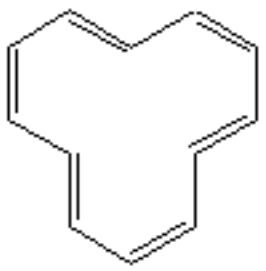
1. a. (10 pts) Consider the following molecules. Put a **circle** around those you would expect to have significant aromatic character, and a big **X** through those that you would expect to have significant antiaromatic character. **Underline** any that you would expect to be simply non-aromatic.



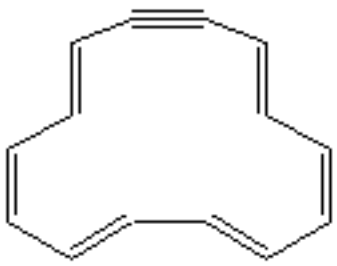








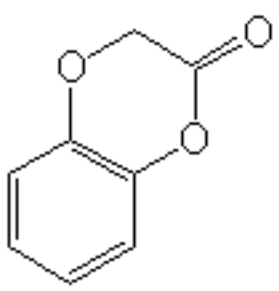
b. (10 pts) Would you expect the illustrated compound to display the properties of an aromatic, antiaromatic, or non-aromatic molecule? Explain briefly and concisely using clear drawings where appropriate. Remember! Orientation matters....



Name: _____

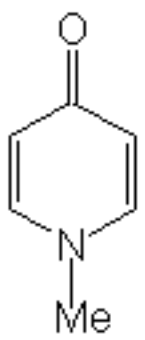
2. Predict the major product, if any, of the following reactions:

a. (7 pts)



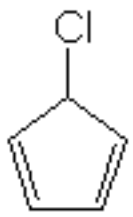
$$\xrightarrow[\text{2. } Br_2,\ FeBr_3]{\text{1. } SO_3, H_2SO_4} \xrightarrow{\text{3. } H_3O^+}$$

b. (7 pts)



$$\xrightarrow{H^+}$$

c. (6 pts)

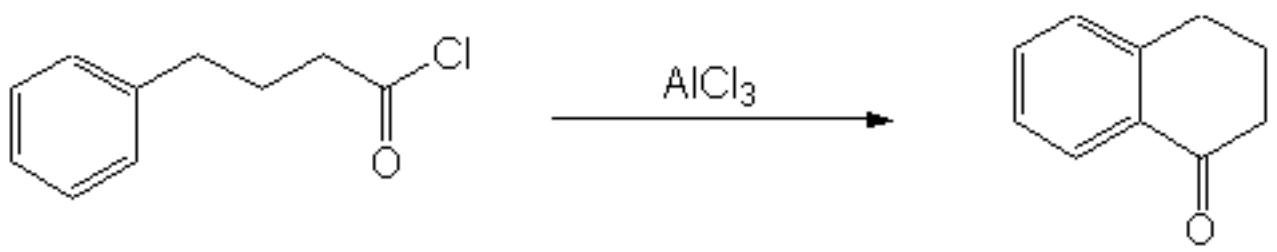


$$\xrightarrow[\text{(Abstracts } Cl^-)]{SbCl_5}$$

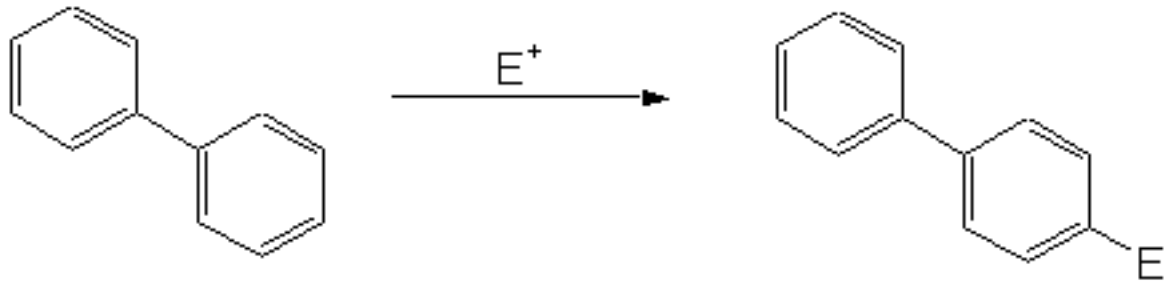
Name: _____

3. Provide detailed mechanisms for the following transformations:

a. (10 pts)

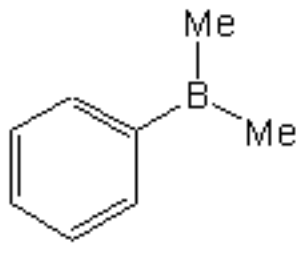


b. (10 pts) For this one, you must also explain with clear drawings why the *para* isomer is the major product.



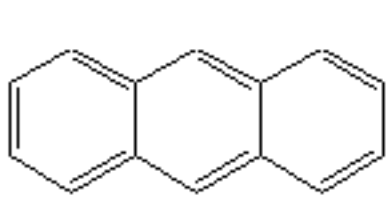
Name: _____

4. a. (10 pts) Predict the major product of the following reaction. Would you expect the BMe_2 group to be an activator or a deactivator? A meta director, or an ortho/para director? Justify your answer with clear drawings.



E^+ →

b. (10 pts) It is well-known that anthracene can act as a diene in Diels-Alder reactions. Your task is to decide *where* on the anthracene the reaction takes place. Show the product of this Diels-Alder reaction, and explain why the reaction takes place at that position of the anthracene.



+

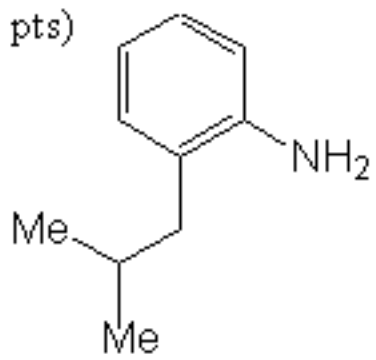
$\xrightarrow{\Delta}$

Resonance Energy

Benzene	= 36 kcal/mol
Naphthalene	= 61 kcal/mol
Anthracene	= 84 kcal/mol

5. Propose syntheses of the following compounds from benzene and any other reagents you need.

a. (10 pts)



b. (10 pts)