Organic Chemistry c3444y

1st Hour Exam

Monday, Feb. 7, 2000
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): _____

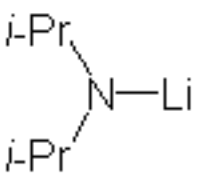
Question 5 (20 pts): _____

Total (100 pts):_____

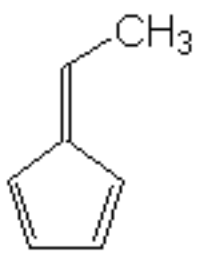
Name: _____

1. 6-methylfulvene is unusually acidic, and can be cleanly deprotonated with lithium diisopropylamide (LDA). (By contrast, propene cannot be deprotonated with LDA.)

a. (10 pts) Indicate at which site you would expect 6-methylfulvene to be deprotonated. Is there any special stability associated with the anion that is generated upon deprotonation of 6-methylfulvene? Explain concisely with clear drawings.

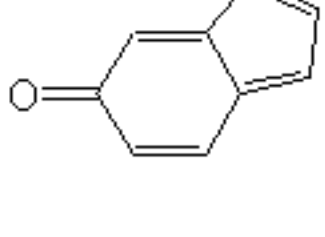


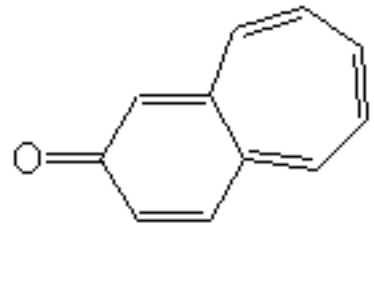
LDA, a strong base



6-Methylfulvene

b. (10 pts) Make a prediction as to the relative stability of the illustrated compounds. Would you expect either of them to have any significant aromatic character? Use resonance structures to clarify your *briefly* worded answer.

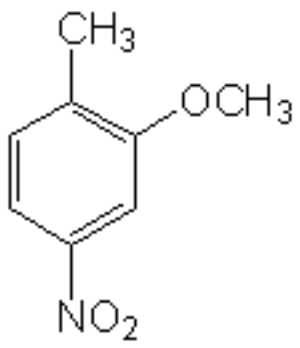




Name: _____

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

a. (7 pts)

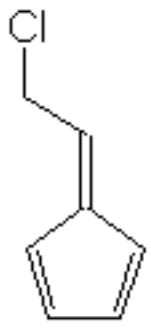


$\xrightarrow[FeBr_3]{Br_2}$

b. (7 pts)

$\xrightarrow[H_2SO_4]{HNO_3}$

c. (6 pts)

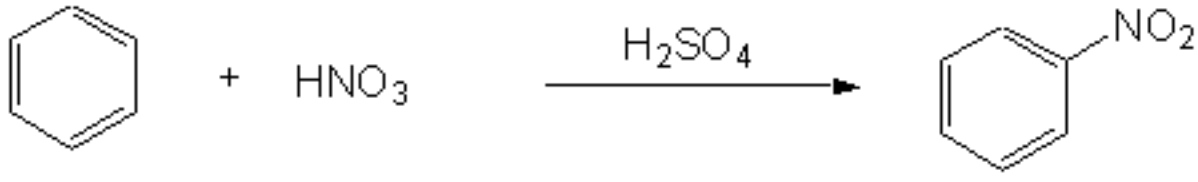


$\xrightarrow{EtOH}$

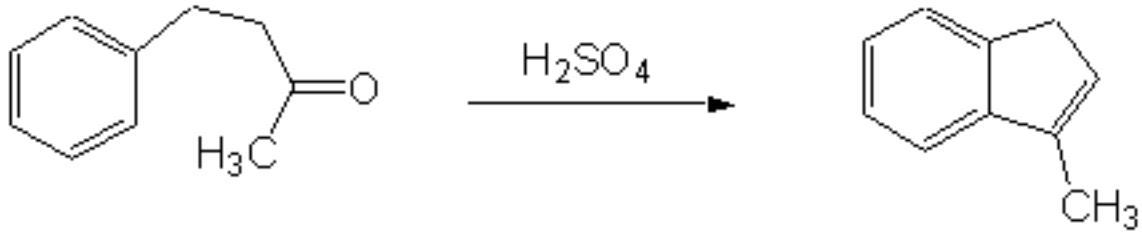
Name: _____

3. Provide detailed mechanisms for the following transformations:

a. (10 pts)

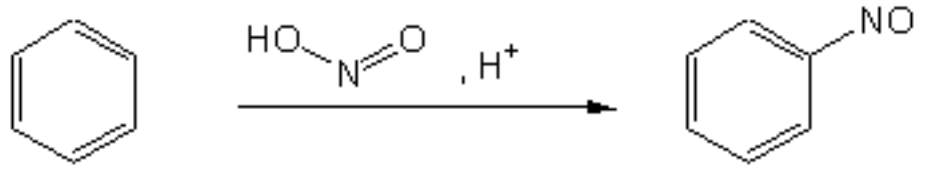


b. (10 pts) (You haven't seen this before, but you know enough to do it.)

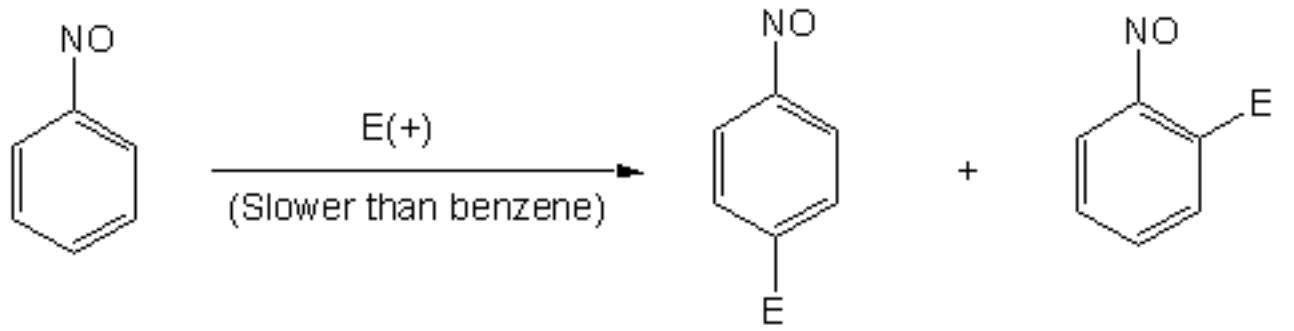


Name: _____

4. a. (10 pts) There is another type of electrophilic aromatic substitution called *nitrosation*. Provide a mechanism for this reaction. First, you must decide what is the actual electrophile here, and how it is formed.



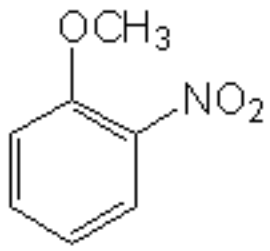
b. (10 pts) Provide an explanation for the fact that the nitroso group (NO) is a deactivator, but an *ortho/para* director.



Name: _____

5. Propose syntheses of the following compounds from the given starting materials.

a. (10 pts)



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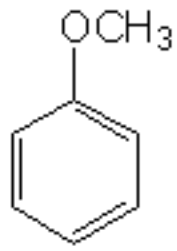
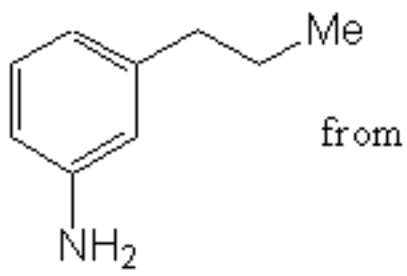


b. (10 pts)



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