

5.12 PRACTICE PROBLEMS FOR FINAL EXAM

5/8/2003

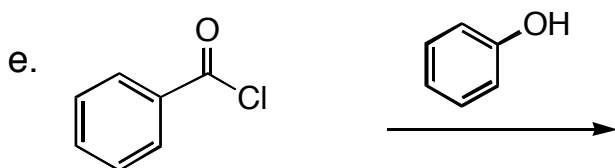
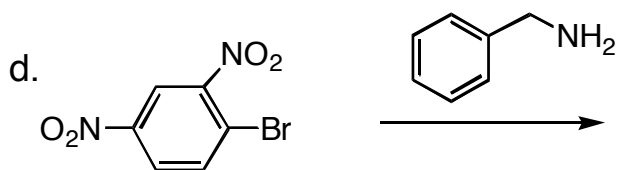
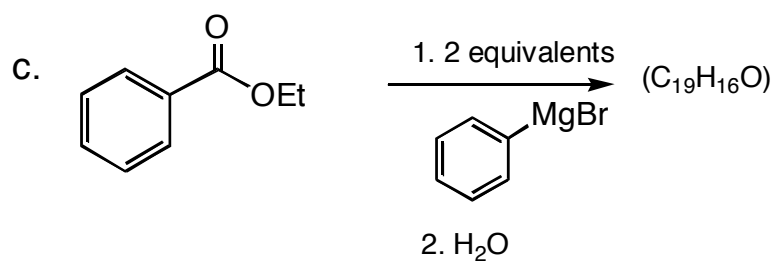
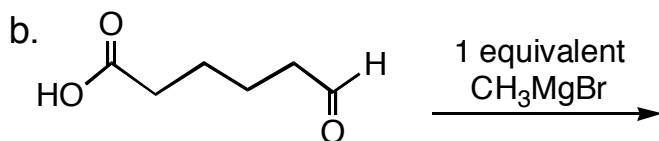
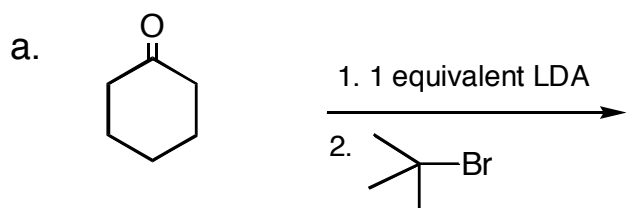
There are a lot of problems here. They are representative of the types of long questions that will be on the final exam.

A key for the practice problems will be posted next Wednesday.

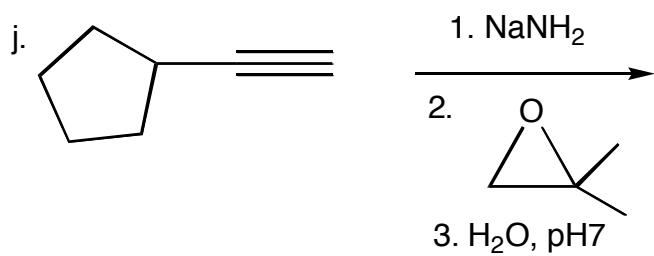
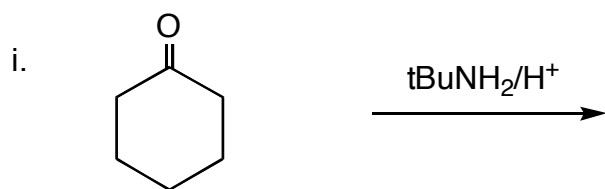
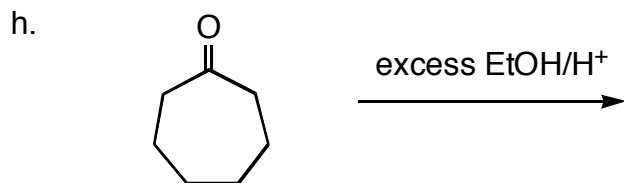
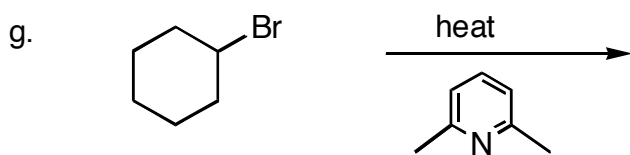
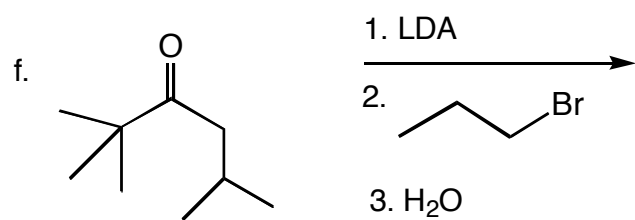
The final will focus on material from the second half of the semester. It will include 20 multiple choice questions and 5 long questions.

I will hold OFFICE hours next week Thursday 4-5p and Friday 10.30-11.30a

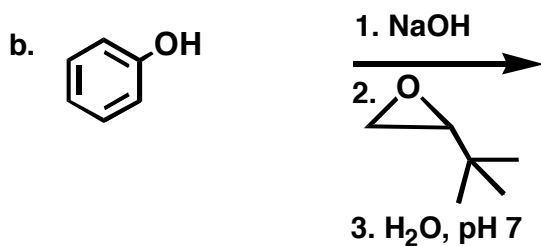
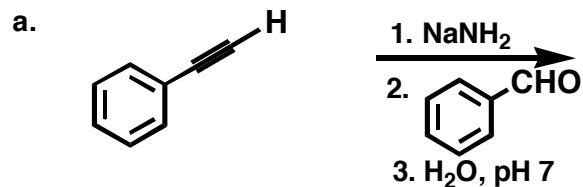
1. Give the principal organic products for the following reactions.



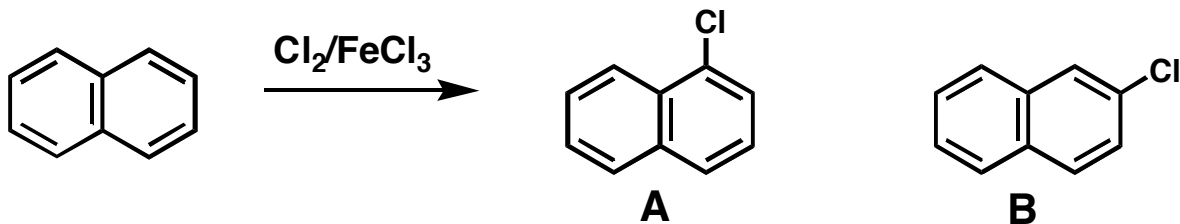
1. (continued) Give the principal organic products for the following reactions.



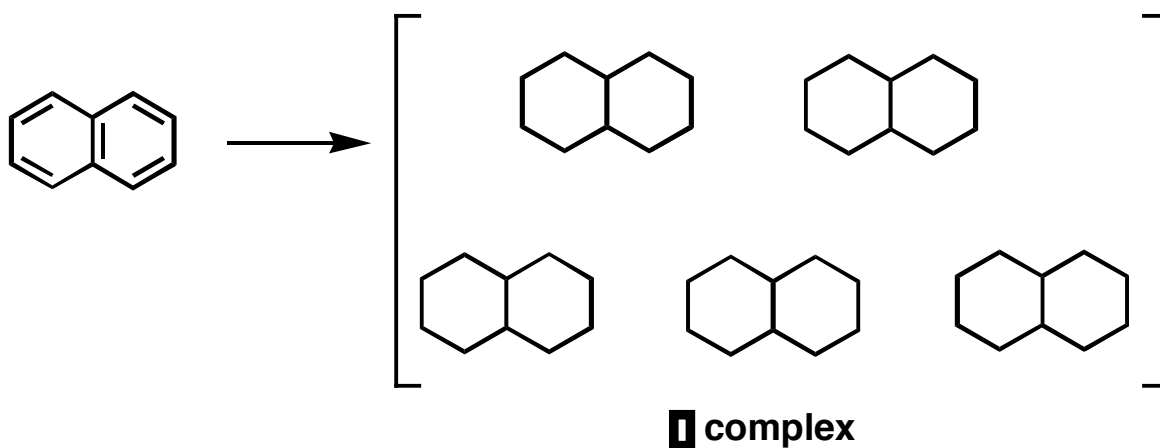
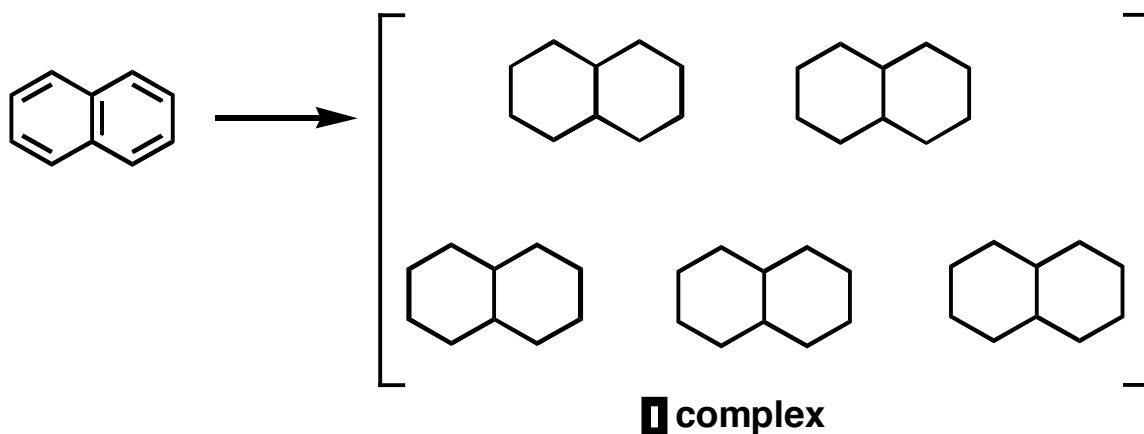
2. For the following pairs of reactants identify the ELECTROPHILIC and NUCLEOPHILIC components and the identity of the product. Note, the actual nucleophile and electrophile may be an intermediate that is formed after reaction with the reagents shown in step 1 of each transformation.



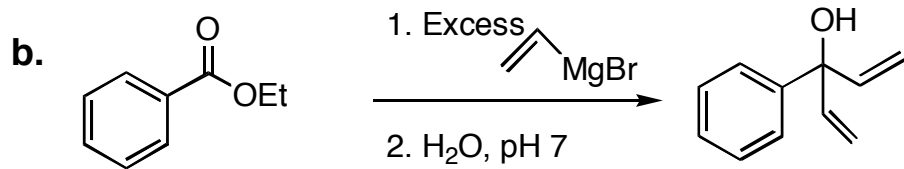
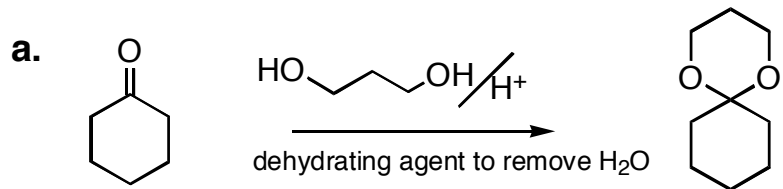
3. When naphthalene is treated with Cl_2 in the presence of FeCl_3 the major product from the reaction is product A and the minor product is B.



Using the mechanism of electrophilic aromatic substitution EXPLAIN the product outcome. Your answer must include a detailed stepwise mechanism and a discussion of the stability of the intermediates formed in the reaction. The carbon framework of naphthalene is predrawn to save you time you just need to add the chlorine substituent, the double bonds and the charge.

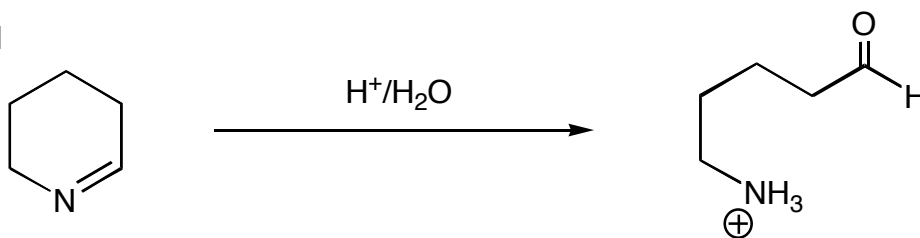


4. Write the complete stepwise mechanism for the following reactions. Show all electron flow with arrows and include all intermediate structures.

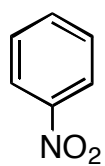


4. continued

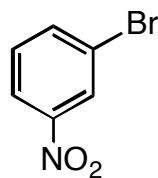
c.



d.



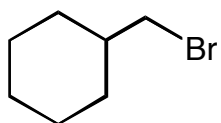
$Br_2/FeBr_3$



Mechanism must account for formation of meta-substitued product.

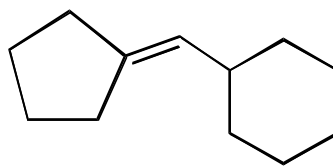
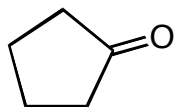
4. continued

e.

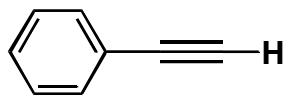


1. Ph_3P
2. $n\text{BuLi}$

3.

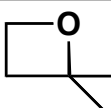


f.

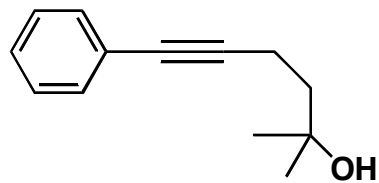


1. NaNH_2

2.



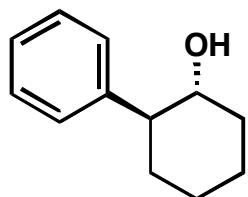
3. H_2O , pH 7



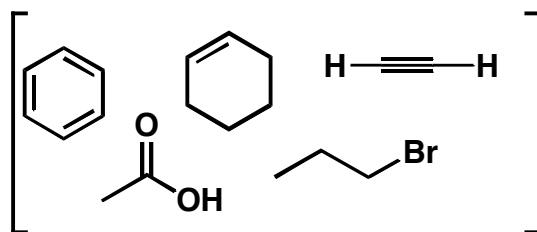
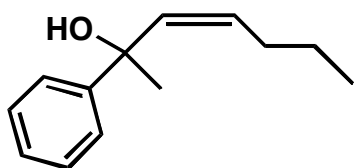
5. Design syntheses of compounds a, b and c.

The pool of carbon-containing starting materials that you can use are shown in the square brackets. You may use any other common reagents.

a.



b.



c.

