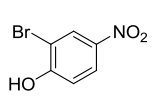
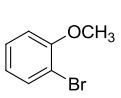
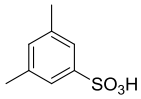
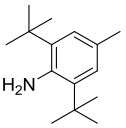
Chemistry 248B Sample Exam 1, 2012, Hanson

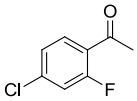
(12) 1. Name the following compounds:

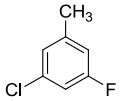










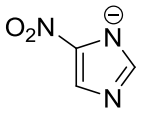


(12) 2. Indicate whether each of the following is *aromatic*, *antiaromatic*, or *nonaromatic*

(6) 3. Give an example of …

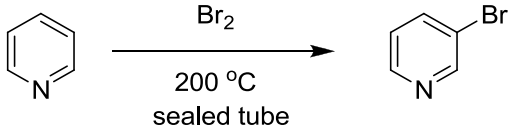
a. …an *endo* Diels-Alder reaction:
b. …an aromatic compound more acidic than phenol:

(10) 4. Draw at least four resonance contributors for the following anion, including the one that you think will be most significant of *all possible* resonance contributors. Circle the one you think will be the most significant.



(10) 5. Not all aromatic reactions involve benzene. For example, pyridine reacts with Br_2 at 200 °C:

Here's the question: Why would the bromine go "meta" to the N that way? Suggest a reason by comparing the stability of intermediates when "Br^+" reacts with pyridine at various positions around the ring.



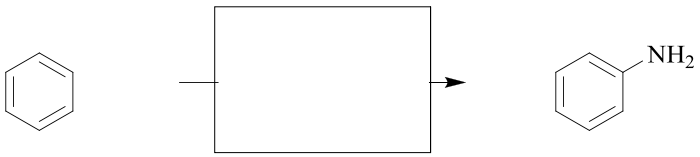
(10) 6. What are three properties that are characteristic of all aromatic compounds?

(10) 7. What are two problems with the Friedel-Crafts alkylation reaction? What is the solution that has been devised to solve these problems? What is one *additional* problem might that solution introduce? Suggestion: Keep your answers brief!

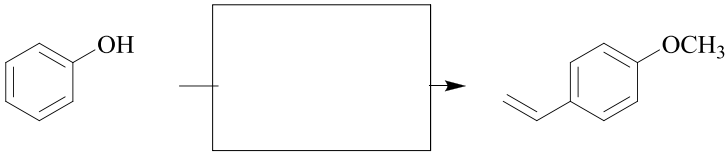
(10) 8. In each case, indicate what sequence of reagents you would use to effect the indicated transformation. Use as many steps as you want.

a)

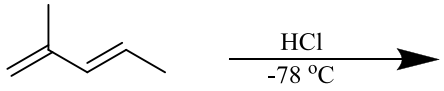
b)

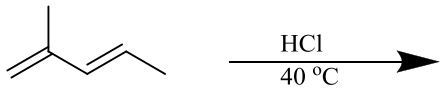


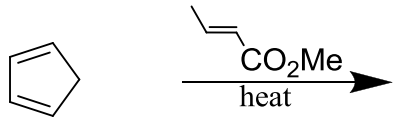
c)

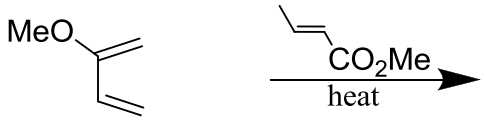


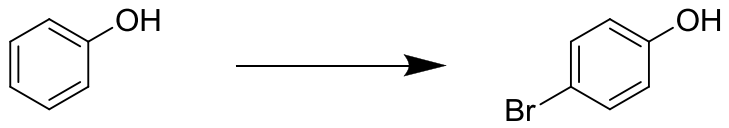
(20) 9. Fill in the blanks for reagent or product. If two isomers, such as ortho and para are both formed, feel free to draw one and then just write “and ortho” or “and para” as appropriate.

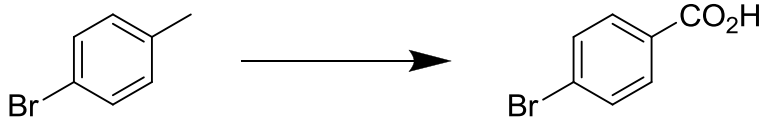
a) 

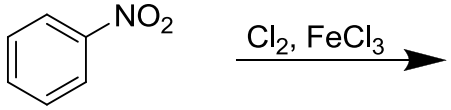
b) 

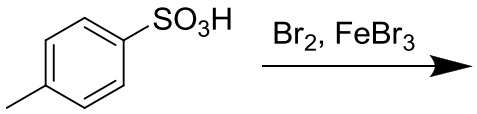
c) 

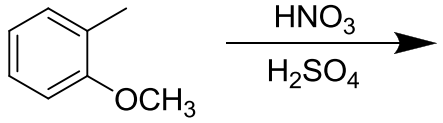
d) 

e) 

f) 

g) 

h) 

i) 

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