

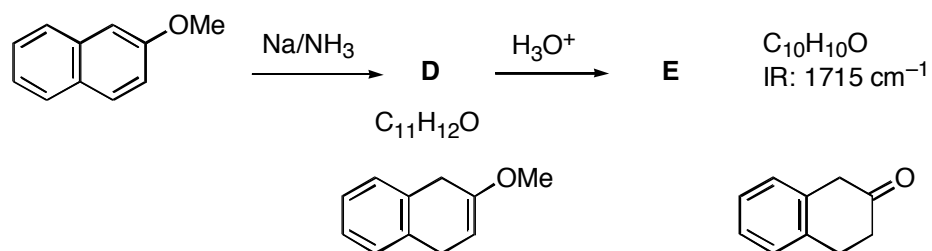
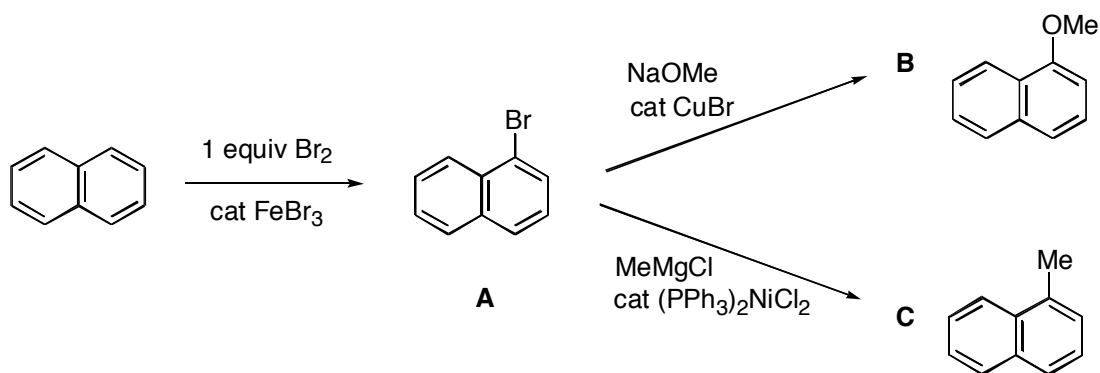
Chem 332
Exam 3
May 8, 2003
Prof. Fox
50 minutes
250 points

The exam is open book,
Open notes. Models are permitted
Show your work in detail

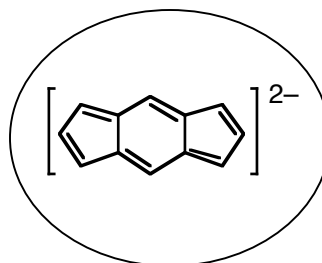
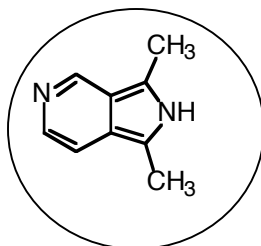
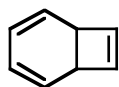
WRITE YOUR NAME ON EVERY PAGE

NAME _____

1. Provide structures of **A** - **E**. 7 points for each correct answer (total 35 pts)



2 (a) Circle the compounds that are aromatic. 7 points for each correct answer (total 21 points)

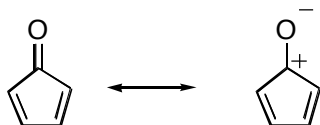


2 (b) Compound **F** is extremely reactive and unstable, whereas compound **G** is exceptionally stable and unreactive. Use your knowledge of resonance and aromaticity to explain why. (34 points)



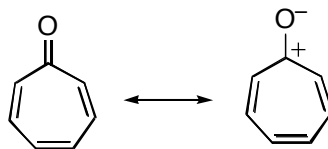
recall that the double bonds of carbonyl compounds have significant contributions from a polar resonance form in which the oxygen bears negative charge and the carbon a positive charge

when we consider such resonance forms of **F** and **G**, we see that **F** has a contributor from an anti-aromatic ($4n$) cyclopentadienyl cation (4 electrons), whereas **G** has a contribution from a very stable and aromatic ($4n+2$) tropylium ion (6 electrons)



F

4 electrons and anti-aromatic

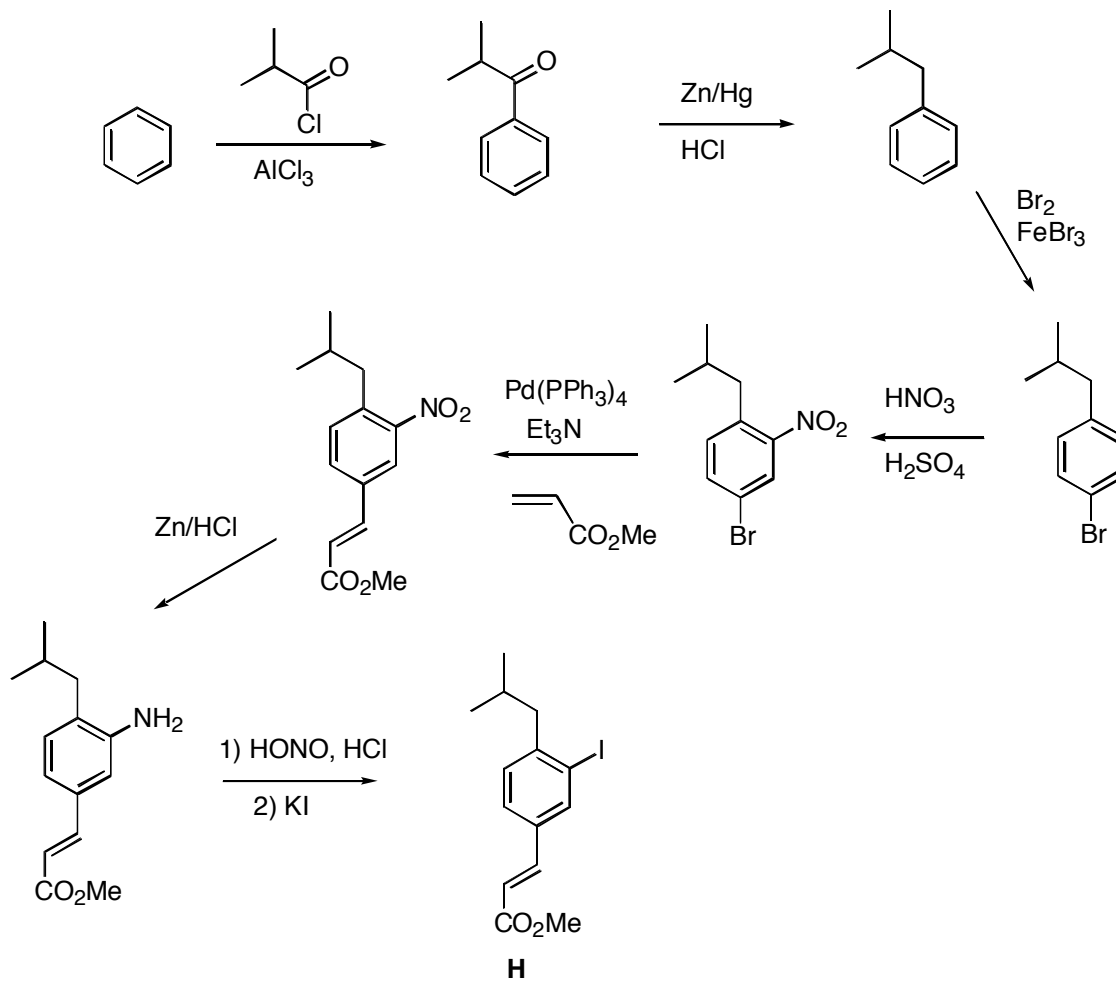


G

6 electrons and anti-aromatic

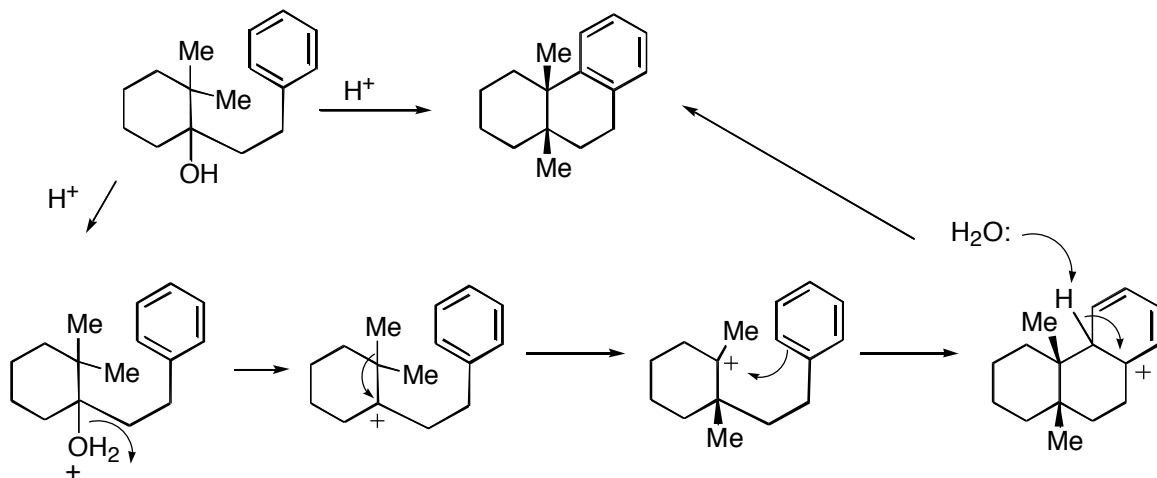
3. Provide a synthesis of **H** using benzene and any other starting materials that contain 5 carbons or less.

(60 pts)



4. Provide a detailed arrow pushing mechanism.

(50 pts)



5. Provide a detailed arrow pushing mechanism. Hint: the most acidic proton of I is positioned between the two chlorines. (50 points)

