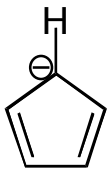
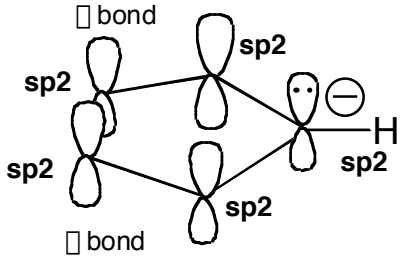
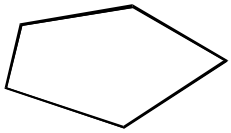
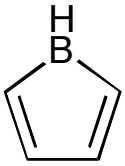
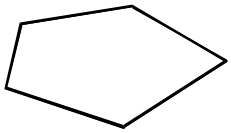
CHEM 5.12
PROBLEM SET #8 Due in Friday April 25th at 4 pm

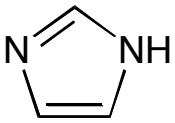
1. (4points) For the following cyclic compounds:
a) Designate whether each is aromatic or not aromatic
b) Draw structures of the molecule (as illustrated in the box) labeling the hybridization state at each atom in the ring, the unhybridized p orbitals and any non-bonding electrons.

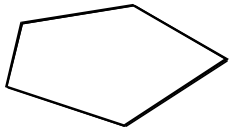
	AROMATIC	STRUCTURE
	yes	

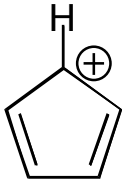


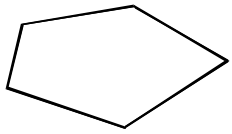




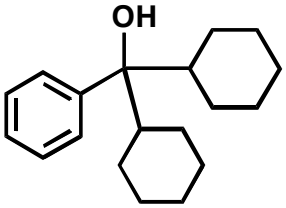


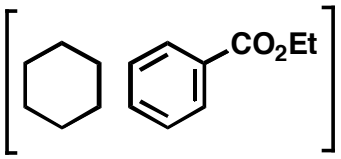




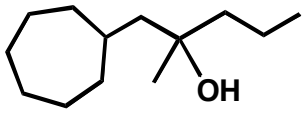


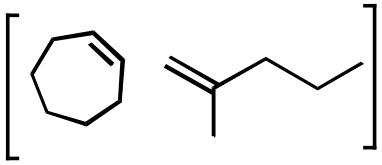
2. (6 points)Design synthesis of the compounds shown on the left. You may use the compounds shown in the square brackets and any other standard reagents



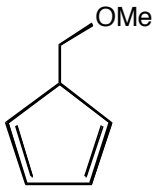


Hint; think back to how you can introduce a halide into an alkane.....





3. (3 points) When compound I is treated as shown below, a mixture of isomeric products of identical molecular formula are obtained. EXPLAIN

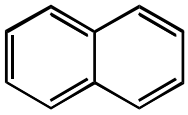


1. Na^+OMe^-/MeOH

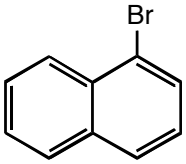
2. neutralize to pH 7

????

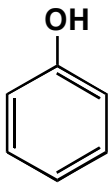
4. (3 points) For the following reactionshow the stepwise mechanism leading to the formation of the product indicated.

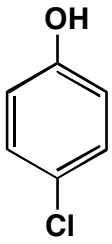


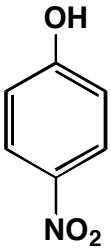
$Br_2/FeBr_3$

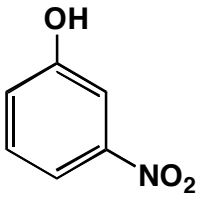


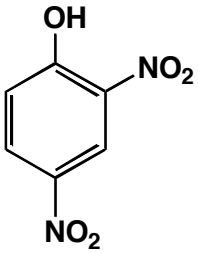
5. (4 points) Below are listed five different phenols and the pKa of the phenolic -OH proton. Explain why the pKa values are so different using resonance and inductive effect arguments (AND DRAWING STRUCTURES TO ILLUSTRATE THESE) as necessary.











pKa 10 **9.38** **7.15** **8.4** **0.4**

Hint - write out the full structure of the $-NO_2$

Extra problems from the book: 10.10, 10.13, 10.38, 10.42, 10.44, 16.5, 16.7, 16.5, 16.34, 16.36.