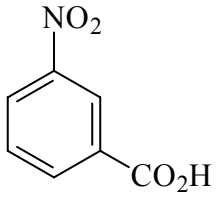
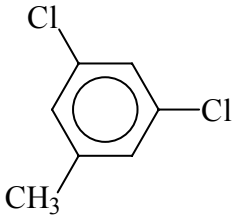
CHM 202 Practice Problems from CH 14-15

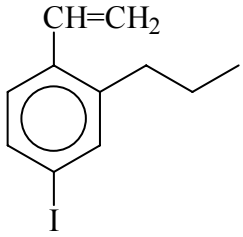
1. Name the following compounds.

a) 

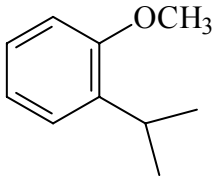
***meta* nitrobenzoic acid**

b) 

3,5-dichlorotoluene

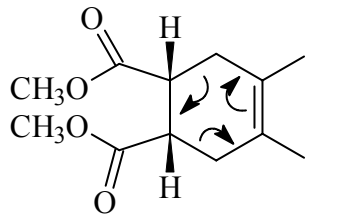
c) 

4-iodo-2-propylstyrene

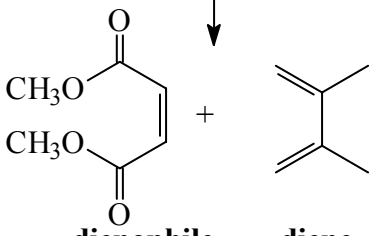
d) 

***ortho* isopropylanisol**

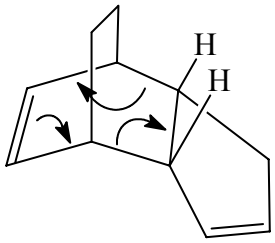
2. Draw the diene and the dienophile (**label each**) that give rise to the following Diels-Alder adducts.

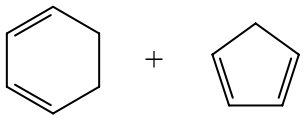
a) 

retro-D.A.



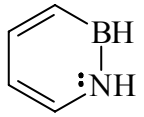
dienophile **diene**

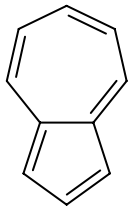
b) 



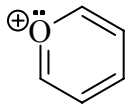
diene **dienophile**

3. List the four essential criteria necessary for a compound to be considered aromatic. Briefly explain why the following species *are* or *are not* aromatic. **Each of the compounds below are 1) cyclic, 2) conjugated throughout – (every atom has a p orbital), 3) planar, and 4) Huckel # of π electrons (4n+2, n = integer).**

a) 

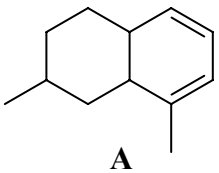
b) 

aromatic

c) 

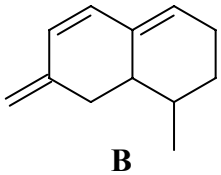
aromatic

4. Predict the λ_{max} (nm) in the UV spectrum for compounds **A** and **B**. Would the two compounds be easily distinguishable by this spectral method? **No, not based on λmax.**



A

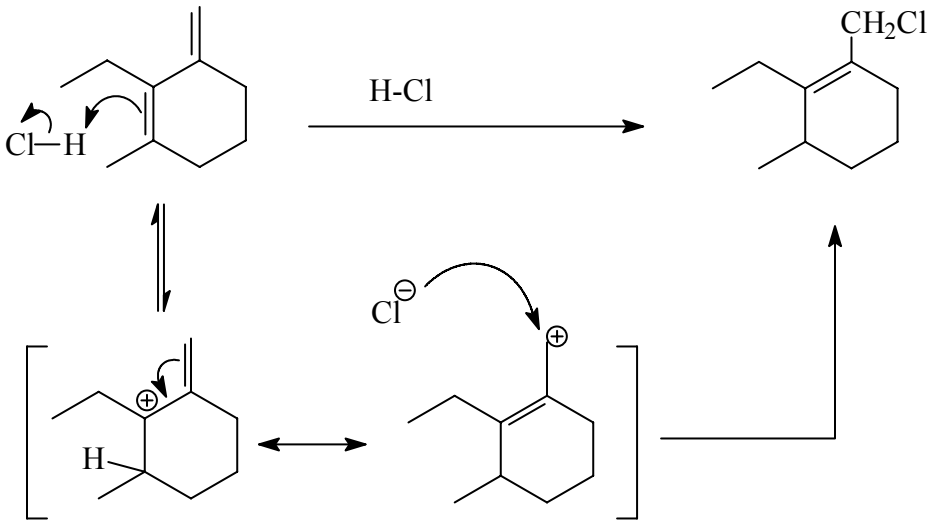
253 cisoid
15 R groups (3)
λmax = 268 nm



B

214 transoid
30 d.bond ext. conj.
15 R groups (3)
10 exocyclic d. bond (2)
λmax = 269 nm

6. Propose a clear mechanism for the following addition reaction.



5. Compound **B** in problem 4 can undergo an addition reaction with HBr to give 2 different 1,2-addition products and 2 different 1,6-addition products. Draw the initially formed intermediates, their resonance structures and the 4 products. **Notice no 1,4-addition occurs as those products are not conjugated.**