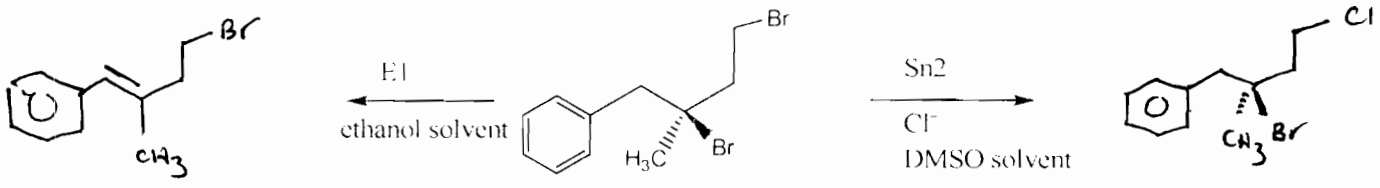
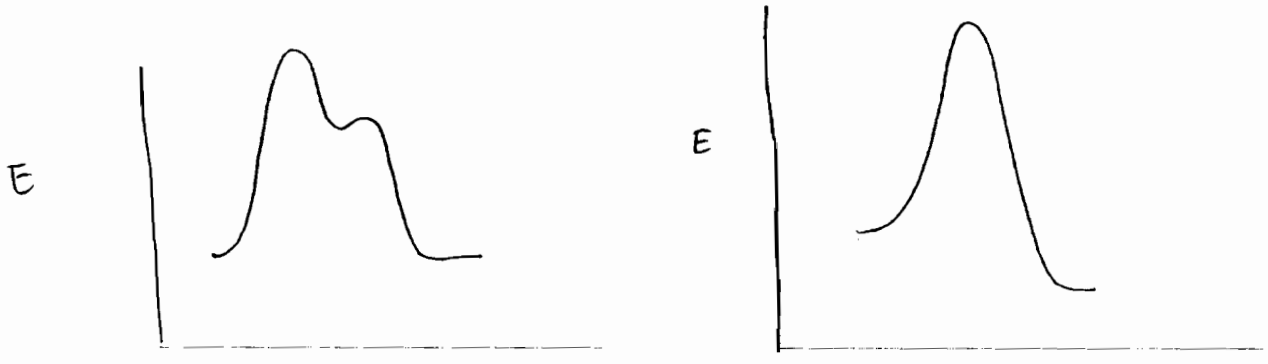
**Chem 235 practcie final exam** Name Tiger Woods

**1.** a)(12 pts) For the dibromide shown below draw the respective products for the Sn2 and E1 mechanisms. Be sure to depict the appropriate stereochemistry.

b) (4 pts) Draw a reaction coordinate diagram below that represents the Sn2 mechanism.

c) (4 pts) Draw a reaction coordinate diagram below that represents the E1 mechanism.



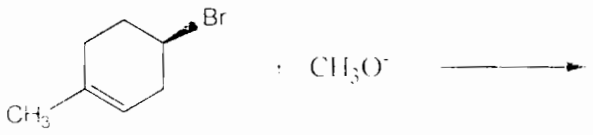

~~For Sn1~~ $E_1$

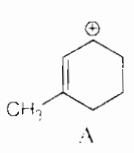
For Sn2

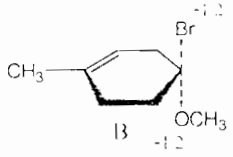
**2.** (6 pts) For the reaction below, identify which structure (A-F) would be the **transition** (intermediate) **state** for:

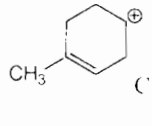
The Sn1 mechanism: C

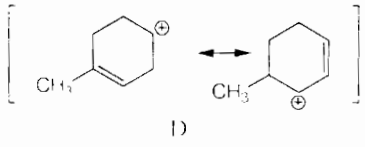
The E1 mechanism: C

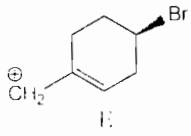


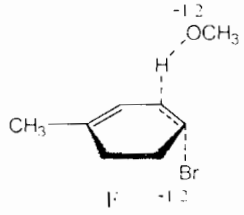



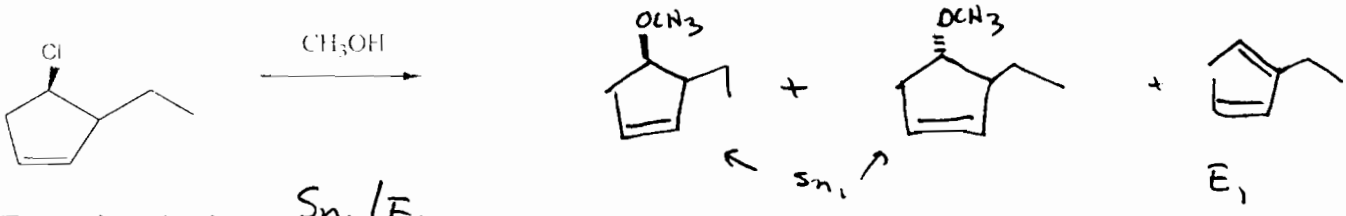



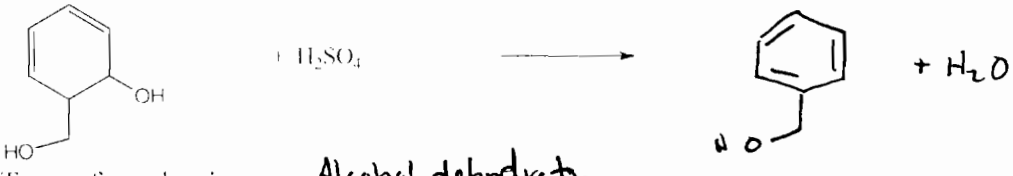



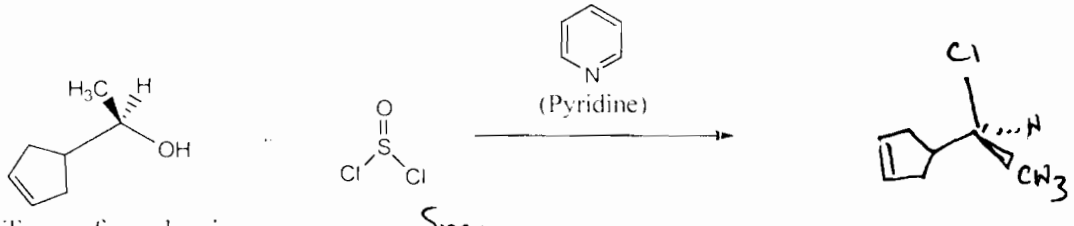

3.(24 pts --8 pts each) For the reactions below, **state if the mechanism is Sn1, Sn2, E2, E1 or an alcohol dehydration** and **draw the major organic product(s)** produced by this mechanism. Be sure to show the pertinent stereochemistry for the product(s).




Type of mechanism Sn1/E1

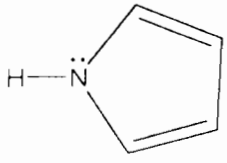


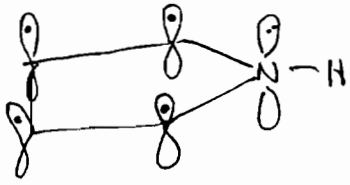

Type of mechanism Alcohol dehydration




Type of mechanism Sn2

**4.** (6 pts) Draw as clearly as you can a 3-D depiction of pyrol (shown below). Draw in the location of all the p orbitals and lone pair electrons. This drawing should show how all the 'aromatic electrons' are in conjugation.

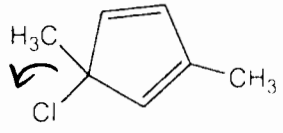




**5.** The 2 alkyl chlorides below undergo an Sn1 reaction with methanol. Reaction #2 is 10 times faster than reaction #1.

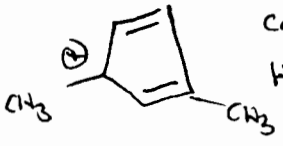
a)(4 pts ea) Depict the major organic product for each reaction.

Reaction #1



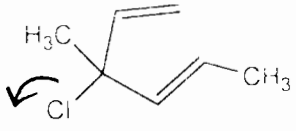
$CH_3OH$

Sn1



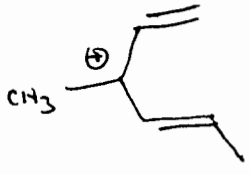
an anti-aromatic cation Higher energy

Reaction #2



$CH_3OH$

Sn1

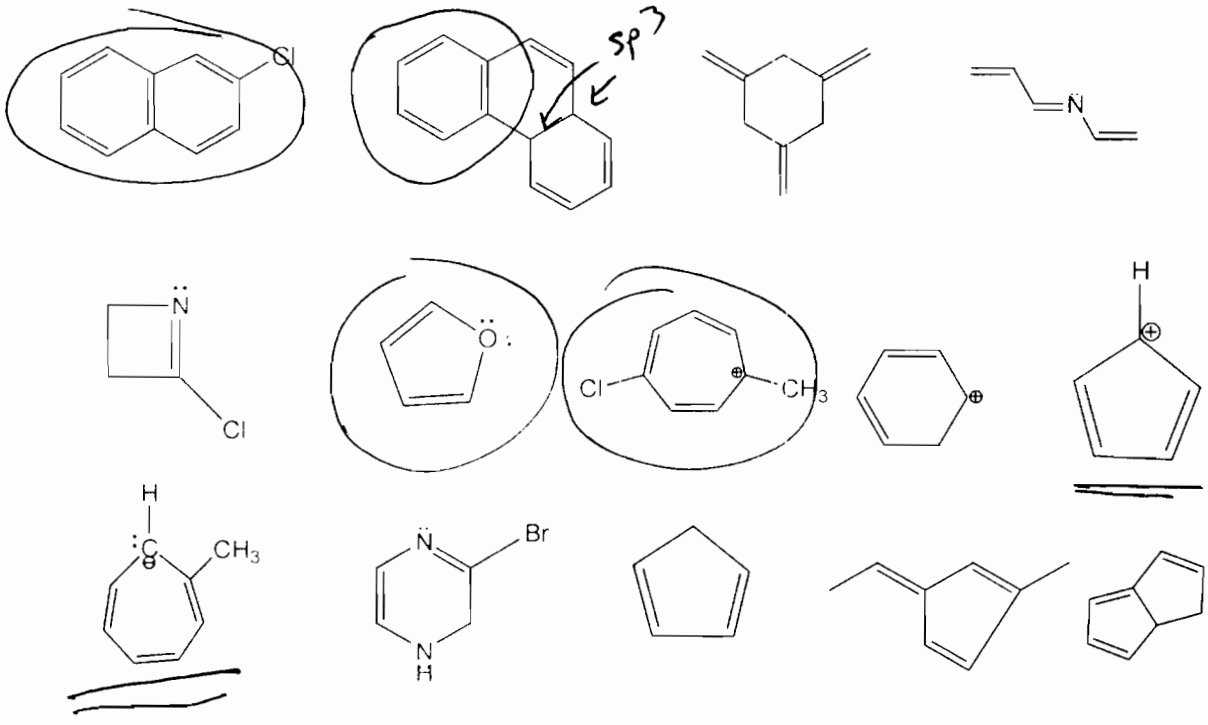


Has 2 good resonance structures ↓ non-aromatic

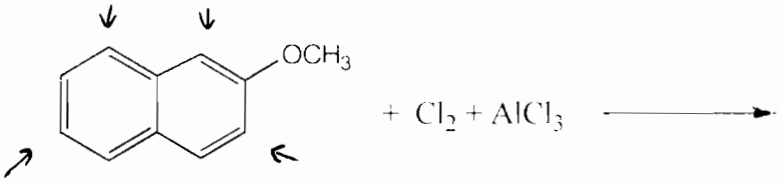
b) (5 pts) Briefly explain why reaction #2 is faster than reaction #1

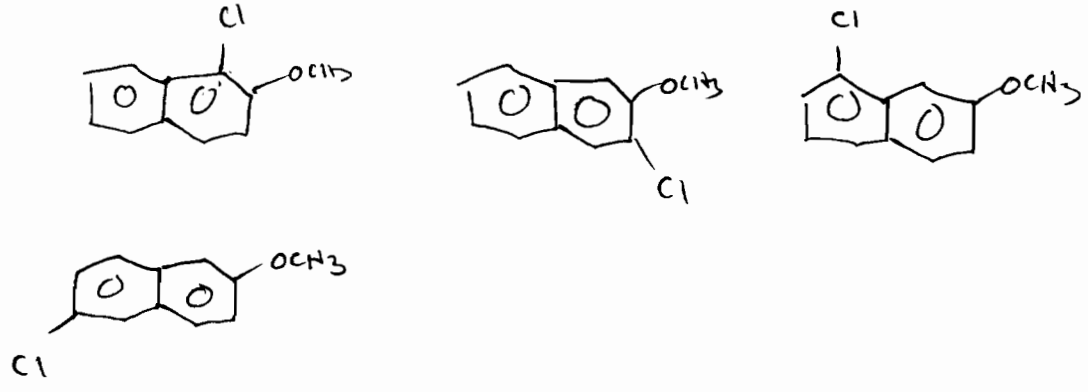
#1 has high energy ~~ant~~ anti aromatic cation ⇒ slow reaction rate.

6. a)(8 pts) Circle the structures below which are **aromatic.**
b)(8 pts) Underline the structures which are **anti-aromatic.**

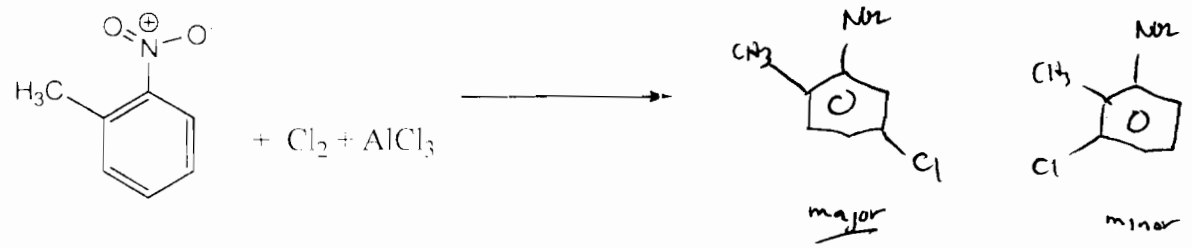


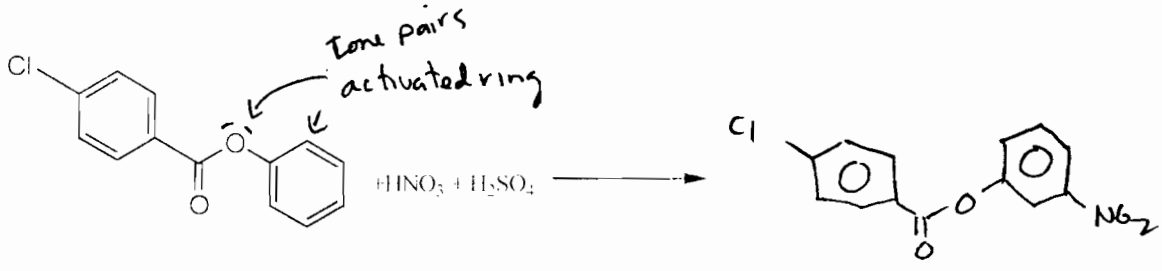

7. (6 pts) Draw all *possible* mono chlorination products for the aromatic compound shown below.

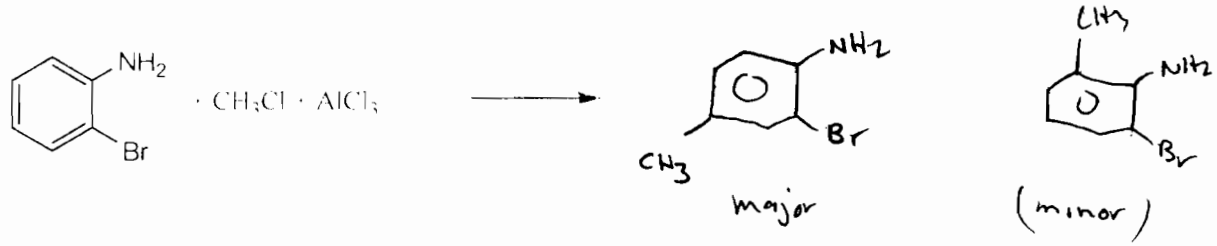


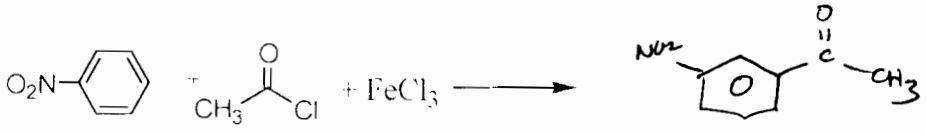



8. (5 pts each) Fill in the major organic product(s) for the reactions below

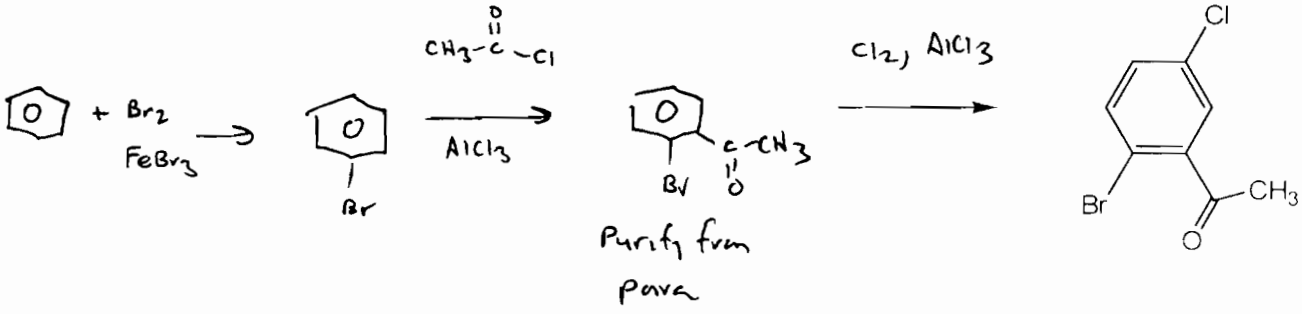


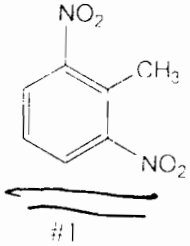



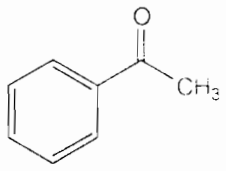

9. (8 pts) Starting from Benzene, synthesize the following compound (use electrophilic aromatic substitution reactions).



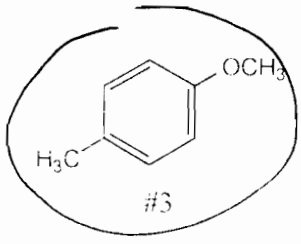
**10.** The 3 compounds below all undergo an Electrophilic aromatic substitution reaction with $Br^+$ (generated from $Br_2$ and $FeBr_3$.)




#1




#2




#3

a) (3 pts)Underline the compound that would react the slowest.
b) (4 pts) **Circle** the compound that would react the fastest

c) (10 pts)Draw the **product and mechanism** for fastest reaction (the circled compound only). Show all pertinent resonance structures of the intermediate.