

1. _____

5. _____

2. _____

6. _____

3. _____

7. _____

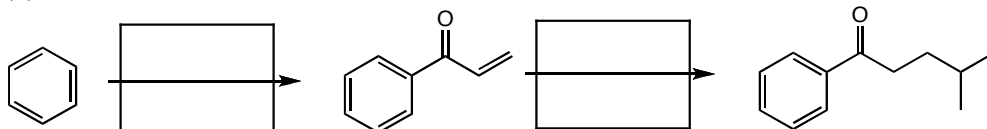
4. _____

8. _____

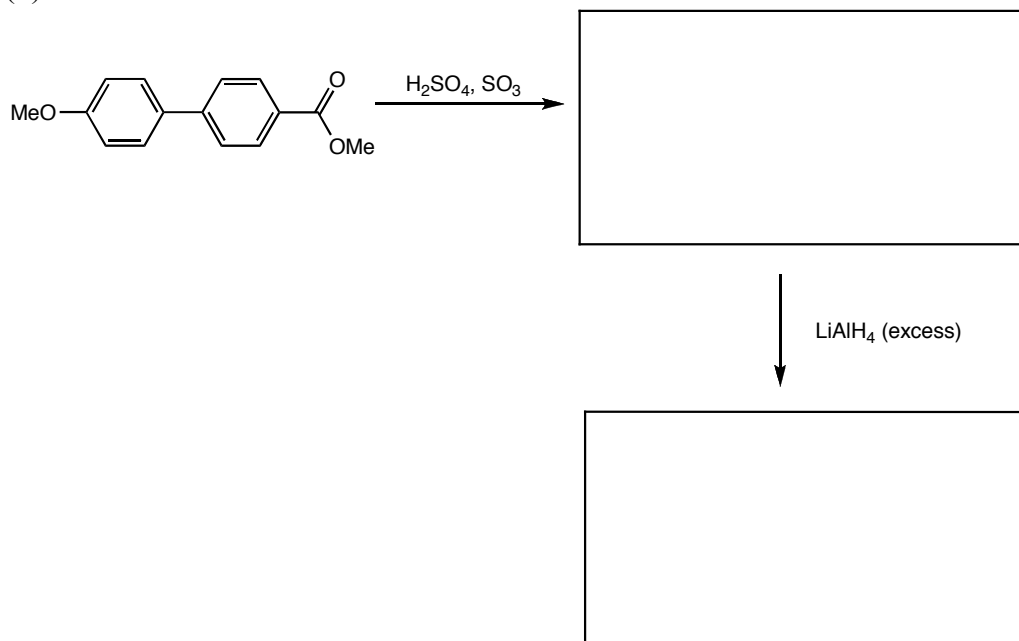


1. Fill in the boxes. Assume a single equivalent of reagent, unless otherwise noted, and that every reaction is quenched. (40 pts)

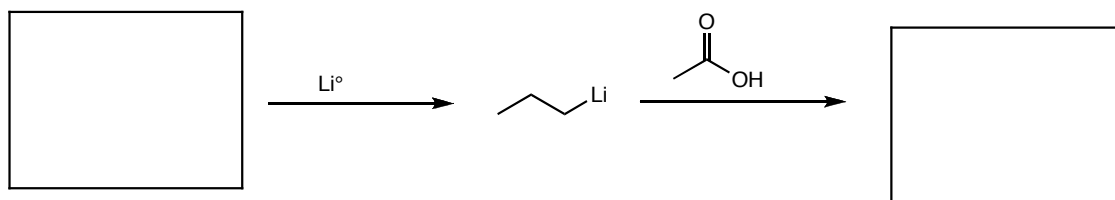
(a)



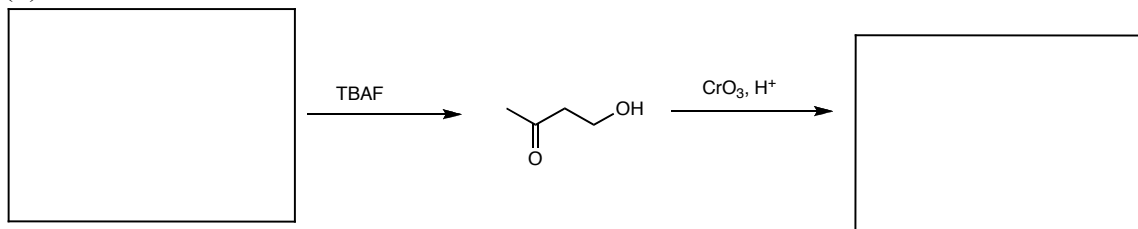
(b)



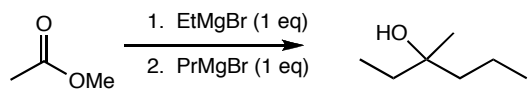
(c)



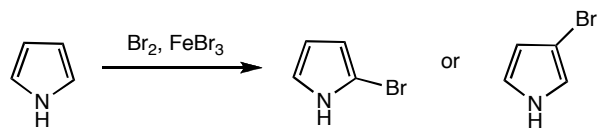
(d)



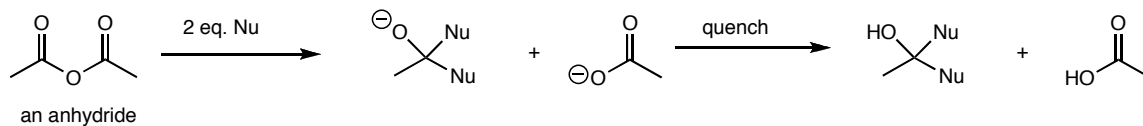
2. Explain why the following does not work. (6 pts)



3. Pyrrole can also react with electrophiles in an EAS reaction. Two possible products can be formed. Using resonance forms, predict which is the major product. (8 pts)

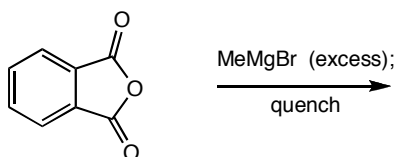


4. Anhydrides react with two equivalents of a nucleophile as shown below.



(a) Do you expect anhydrides to be more or less reactive than esters? Why? (6 pts)
 Extra credit: more or less reactive than acid chlorides? Why?

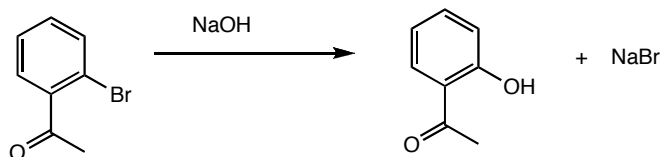
(b) Predict the product(s) of the following reaction. (5 pts)



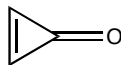
5. Determine if the following are non-aromatic, aromatic, or anti-aromatic. Assume fully conjugated species are planar. (9 pts)



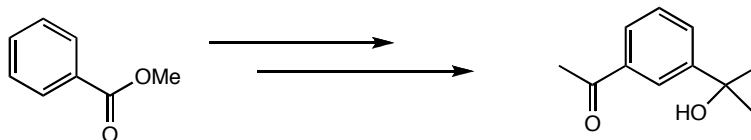
6. Aromatic compounds that contain a leaving group ortho or para to an electron withdrawing group can undergo *nucleophilic* aromatic substitution, as shown below. Propose a mechanism for this transformation (hint: the reaction does not work without the carbonyl). (8 pts)



7. Cyclopropenone is much more stable than expected, given its ring strain and unsaturation. Explain why. (6 pts)



8. Propose a synthesis of the target molecule, using the starting material given, and any other organic or inorganic reagent you may need. No mechanisms are necessary. (12 pts)



Extra Credit: My netflix queue is empty once again. Any suggestions?

