

1. _____

2. _____

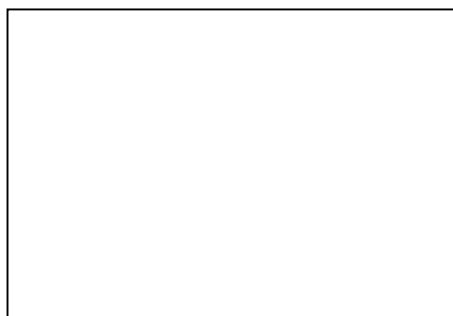
3. _____

4. _____

5. _____

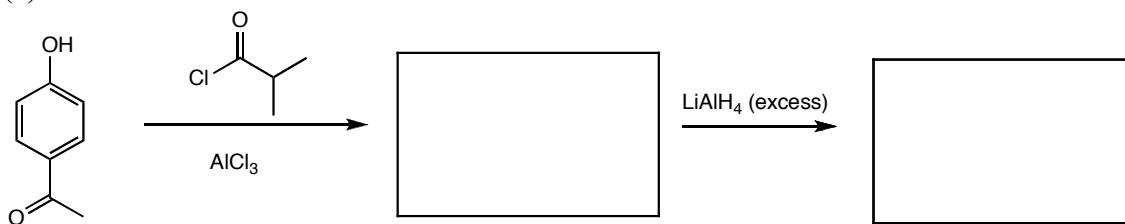
6. _____

7. _____

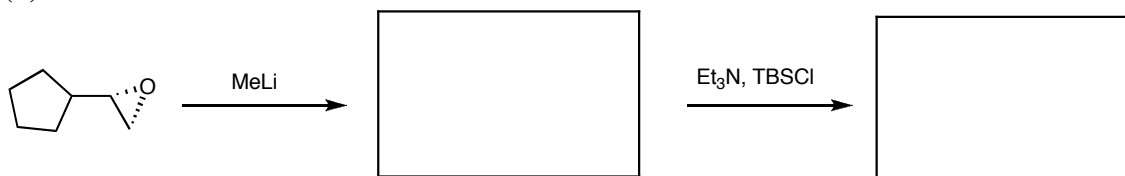


1. Fill in the blanks for the following reactions. Assume a single equivalent of reagent, unless otherwise noted, and that every reaction is quenched. (40 pts)

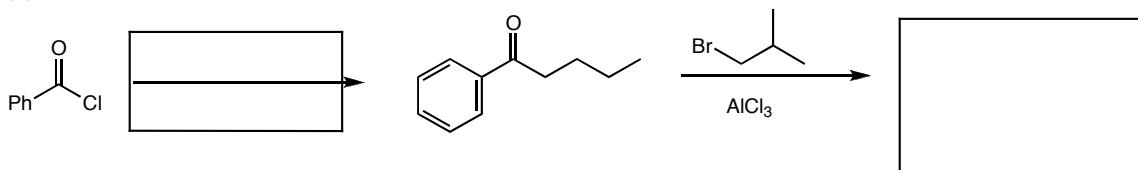
(a)



(b)



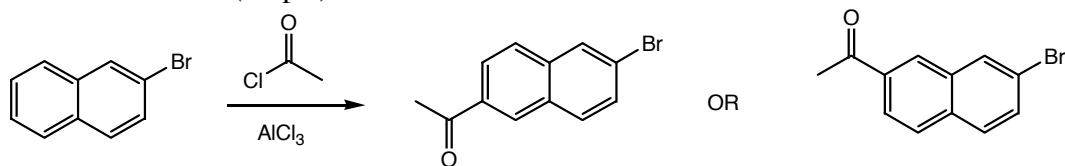
(c)



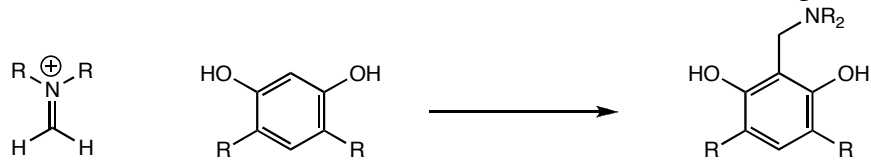
(d)



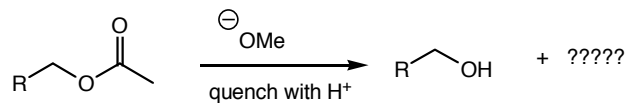
2. In the following reaction, one of the products is formed preferentially over the other one. Circle the product that is more likely to be formed, and explain why using resonance forms. (10 pts)



3. The following reaction is a key step in a current Bates student's senior thesis. Draw the mechanism for this reaction (the solvent for the reaction is water). (8 pts)



4. Esters are commonly used as protecting groups for alcohols. One way to deprotect an ester protecting group is to treat it with sodium methoxide (followed by an acidic quench). (14 pts)



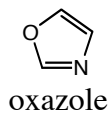
(a) Propose a mechanism for the deprotection.

(b) What is the other organic compound that is formed in the reaction?

(c) As we discussed in class, it is important that a protecting group be stable to all reaction conditions. Circle the conditions below that could not be used if there were an ester protecting group in the molecule.

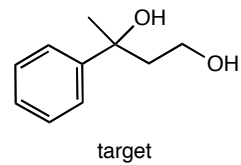
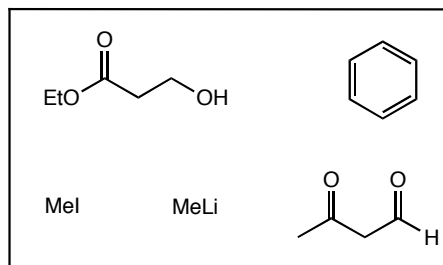


5. Draw an energy diagram of the molecular orbitals of oxazole (you do not need to draw the molecular orbitals, just their relative energies). From your diagram, determine if the molecule is aromatic or anti-aromatic. (8 pts.)



6. Sketch a ddd (doublet of doublet of doublets), in which all three coupling constants are different. (8 pts) (2008: cannot do)

7. Propose a synthesis of the target molecule below. You may only use the compounds in the box as sources of carbon, but you may use any other reagent necessary. (12 pts)



Extra Credit: My Netflix queue is empty. Suggest up to three movies to fill it up.