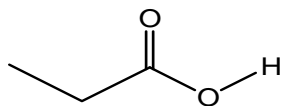
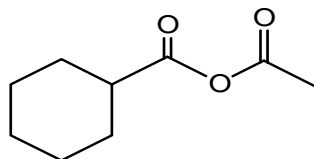


**CHEM 236 practice Exam #1**

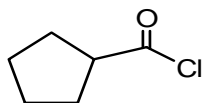
1. (8 pts) Name the functional group of each compound shown below:



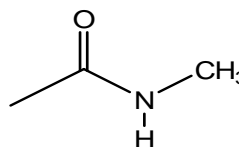
Functional group:



Functional group:



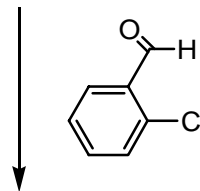
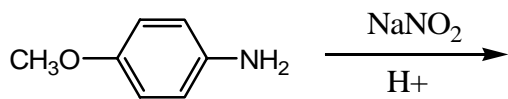
Functional group:



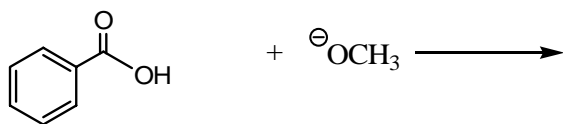
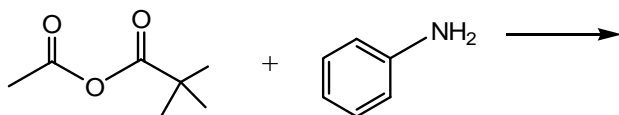
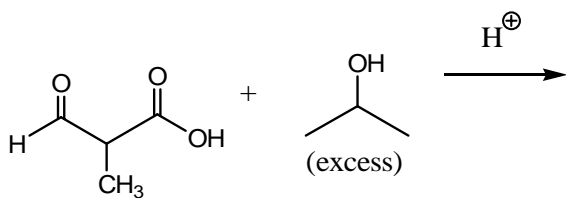
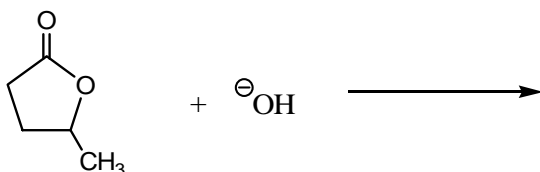
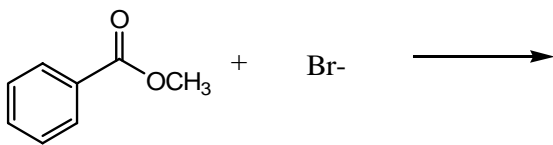
Functional group:

2. (6 pts) Draw in the 'diazonium salt and final product of the Azo dye synthesis shown below.

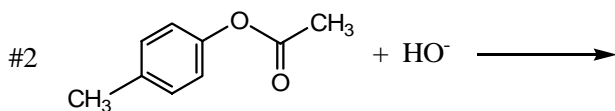
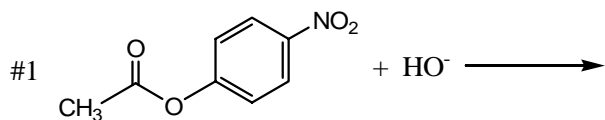
Diazonium salt



3. (4 pts each) Draw the major products of the following reactions. Write NR If there is no reaction.

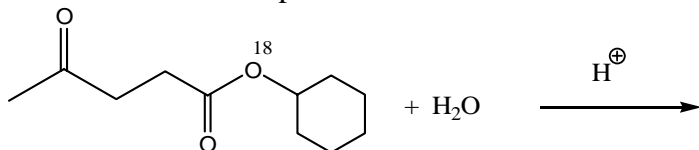


4. a. (3 pts each) Fill in the products of both reactions below

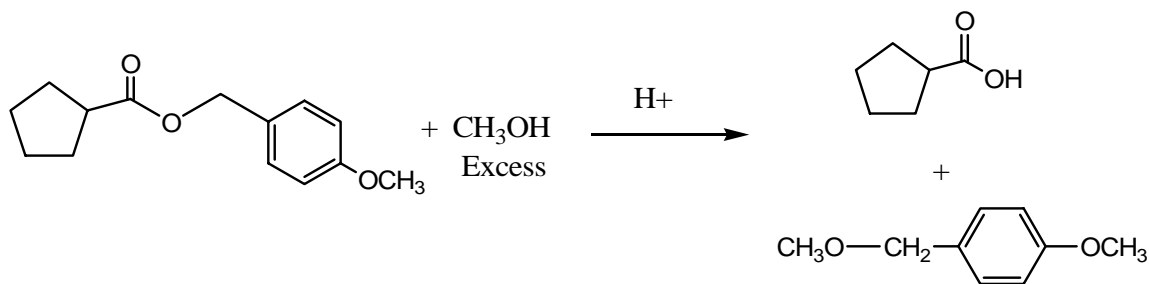


b. (4 pts) Reaction #1 proceeds at a rate 10 times as fast as reaction #2. Briefly explain.

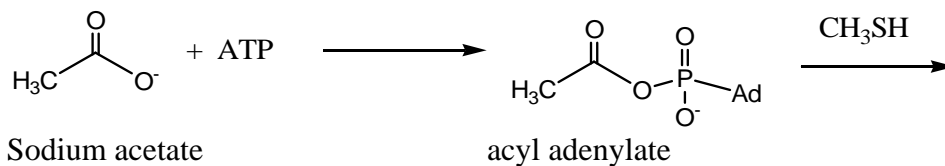
5.a (10 pts) The ester below undergoes a nucleophilic acyl substitution reaction when it is reacted with excess water under acidic conditions. Carefully draw the **mechanism and products** of this reaction. Be sure to note which oxygen is "O18" during each step of the mechanism and final product



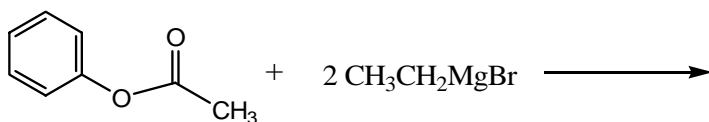
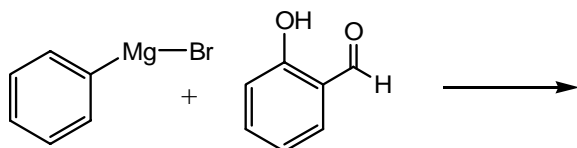
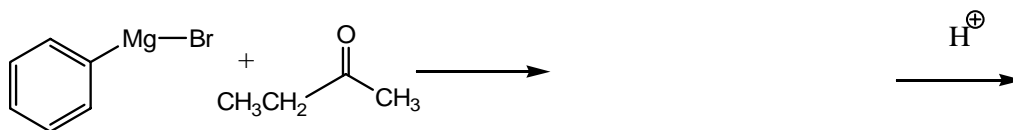
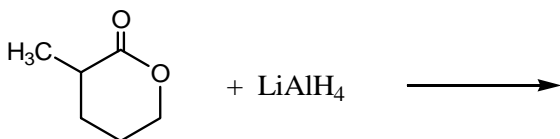
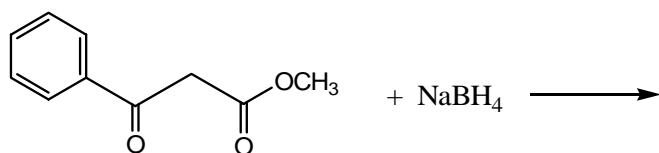
b. (8 pts) Draw the **mechanism** for the reaction below (hint: this **does not** go by the expected nucleophilic acyl substitution reaction.).



6. (4 pts) Sodium acetate reacts in the body with ATP (adenosine triphosphate) make the acyl adenylate (shown below). The acyl adenylate will then undergo a nucleophilic acyl substitution reaction with A thiol(CH<sub>3</sub>SH). Draw the products of this reaction



7. ( 5 pts each) Draw in the products for the reactions below. (You do not need to show stereochemistry)

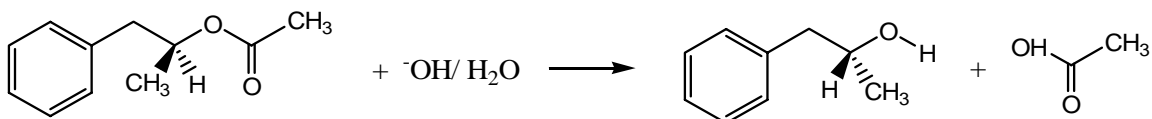


Answer questions #8 and #9, using the following 3 possible ester hydrolysis mechanisms

**SEE KEY TO VIEW THE MECHANISMS**

8. (5 pts) The ester hydrolysis below gave the following results.

Which mechanism above would best fit these results? (#1, #2 or #3)\_\_\_\_\_



9. (4 pts) For the ester hydrolysis reactions shown, reaction A was 10 times slower than reaction B.

Which mechanism above would best fit these results? (#1, #2 or #3)\_\_\_\_\_

