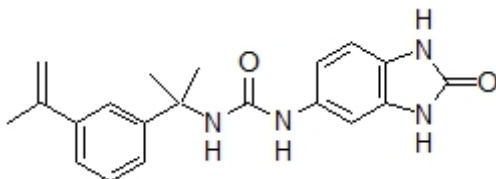


I. Nomenclature

1. The following compound is effective in treating the parasite, cryptosporidium parvum (*J. Med. Chem.* **2012**, 7759). What carbonic acid derivative is contained in this structure. (2 points)

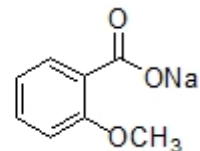
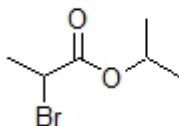
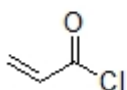


2. Draw structures for each of the following compounds listed below. (5 points)

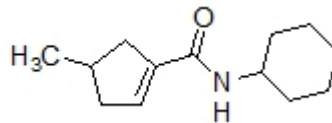
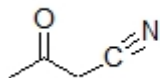
succinic anhydride

N-ethyl- -valerolactam

3. Provide common names for each of the following structures. (9 points)

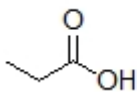
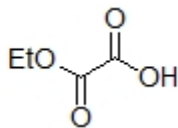
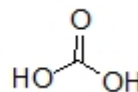


4. Use IUPAC rules to name each compound below. (6 points)



II. Theory

1. Which of the following sequences ranks the structures below in order of increasing acidity? (3 points)

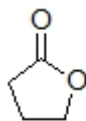
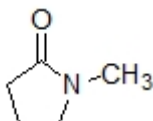
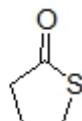
**1****2****3**

- a) 1<2<3 b) 2<3<1 c) 3<1<2 d) 3<2<1 e) 2<1<3 f) 1<3<2

2. Assuming equal molecular weights, circle all of the following compounds, indicated by their functional group, that would have a higher boiling point than a alcohol. (2 points)

- a) carboxylic acid b) ester c) nitrile d) 2° amide e) 3° amide

3. Which sequence ranks the following carbonyl species in order of increasing reactivity toward nucleophilic addition? (3 points)

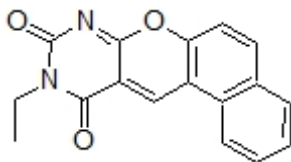
**1****2****3**

- a) 1<2<3 b) 2<3<1 c) 3<1<2 d) 3<2<1 e) 2<1<3 f) 1<3<2

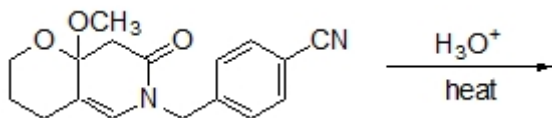
4. Provide the structure of at least one repeating unit of PETE. (3 points)

III. Reactions

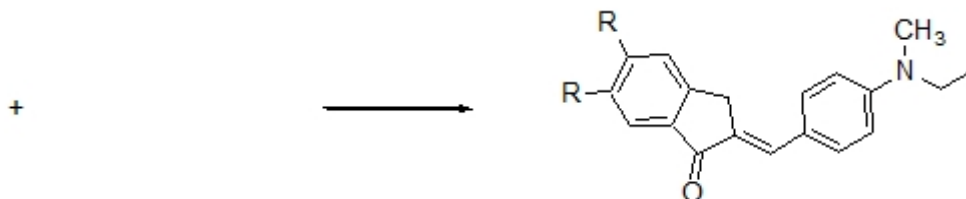
1. The following compound was recently reported in *J. Med. Chem.* **2012**, 8193, and was found to be effective against leukemia and other forms of cancer. Circle all carbon centers at the same oxidation state as a carboxylic acid (3 points)



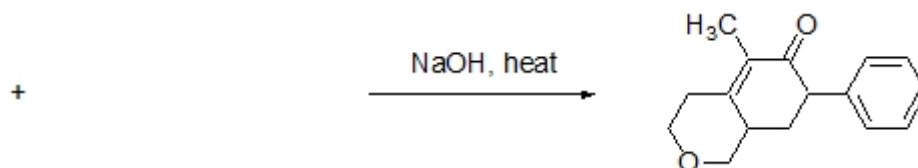
2. Predict the structure of the following hydrolysis product resulting from the reaction below. (6 points)



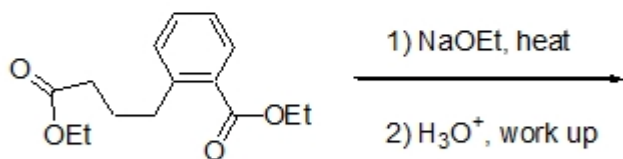
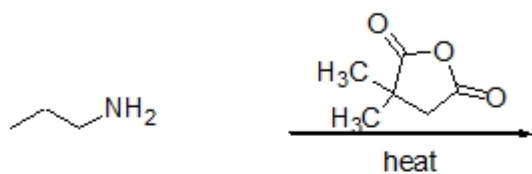
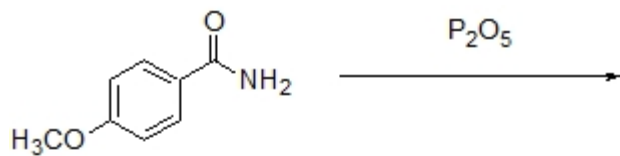
3. The following product helps to slow Alzheimer's disease by slowing build up of β -amyloid aggregation (*J. Med. Chem.* **2012**, 8483). Show how it can be made using an aldol condensation reaction. (4 points)



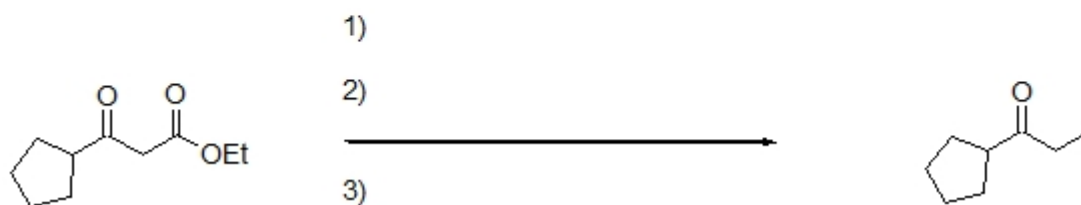
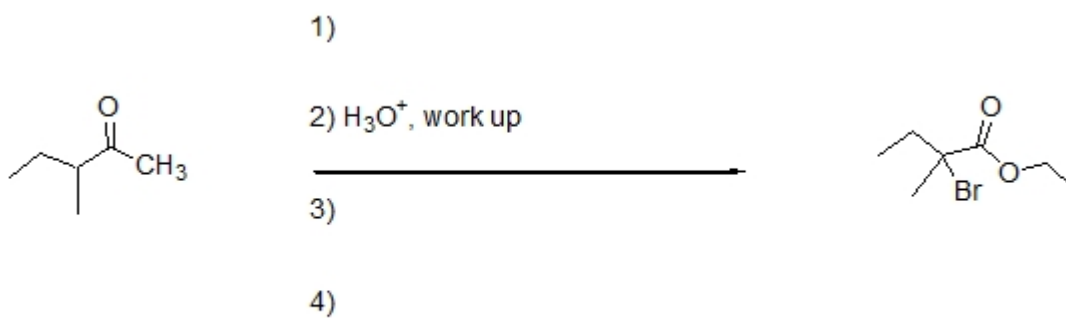
4. Show how the following compound may be made using a Robinson annulation. (6 points)



5. Draw a structure for the product of each of the following reactions. (12 points)



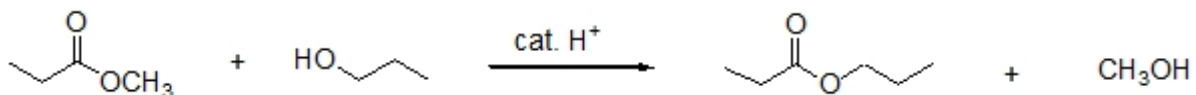
6. Provide the necessary reagents for each of the following transformations. (16 points)



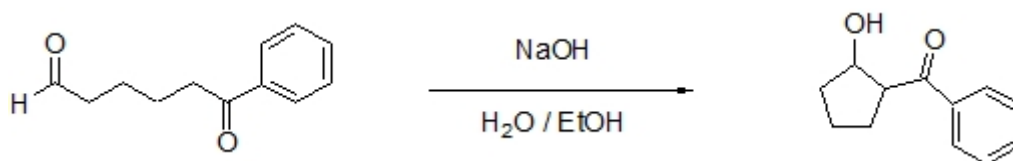
IV. Mechanisms

1. Provide electron arrow pushing mechanisms for the following reactions. Show all intermediate structures and formal charges.

(12 points)

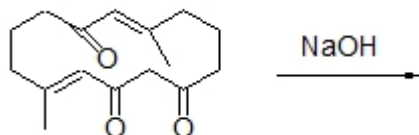


(8 points)



V. Extra Credit (5 points possible)

1. Predict the product of the following reaction. (5 points)



You received _____ points out of 100 points possible. To check your overall performance in lecture see <http://canvas.weber.edu>.