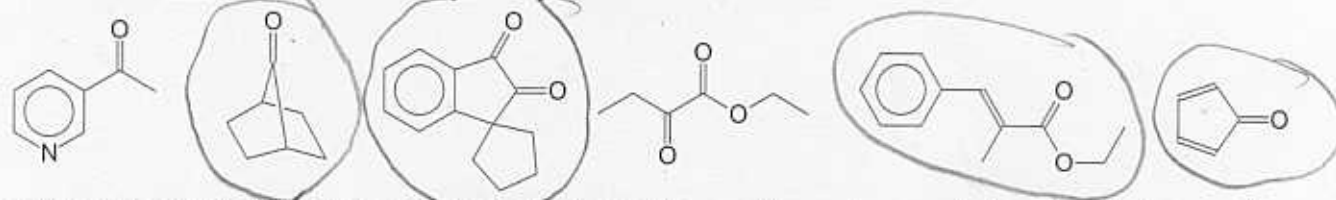
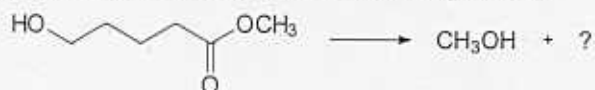


Chem 304 Problem Set 6

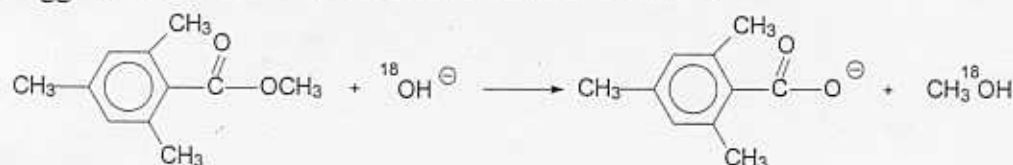
1. Circle all non-enolizable carbonyl compounds!



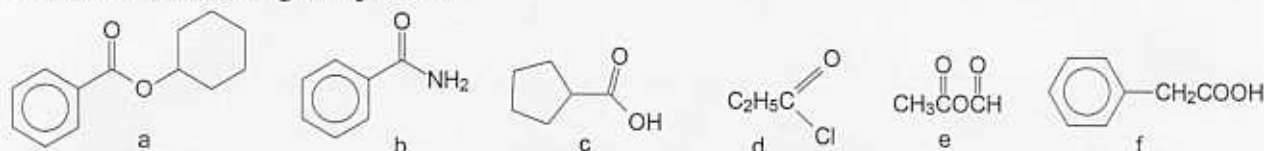
2. When the ester shown below is heated under acidic conditions, two products are isolated, one of which is methanol. Suggest a structure for the other product!



3. The base promoted hydrolysis of methyl mesitoate, shown below, with ^{18}O labeled sodium hydroxide results in labeled methanol. Where would you have expected the ^{18}O label to appear? Suggest a mechanism for this reaction and rationalize it!

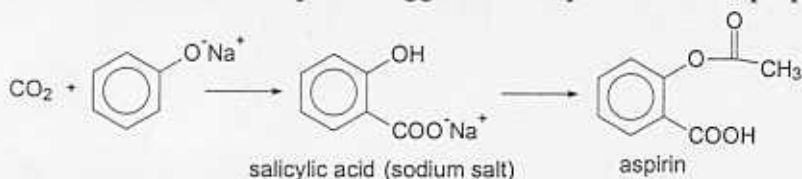


4. Name the following compounds!

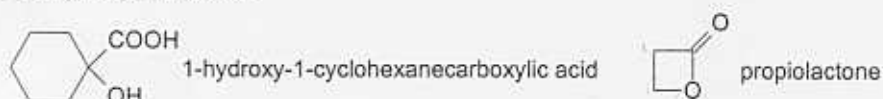


5. Nylon is commonly prepared from 1,6-diaminohexane and hexanedioic acid. Discuss how both compounds could be prepared from cyclohexanone!

6. Salts of phenols often react with carbon dioxide under pressure ("Kolbe reaction"). Thus, aspirin is prepared starting with sodium phenolate and carbon dioxide, as shown below. Propose a mechanism for this step and suggest how aspirin could be prepared from salicylic acid!



7. A common method for the preparation of α -hydroxycarboxylic acids consists of treating a ketone to the corresponding cyanohydrin, followed by treatment with hot dilute sulfuric acid. Illustrate how 1-hydroxy-1-cyclohexanecarboxylic acid could be prepared in this fashion. State suitable conditions.




8. Propiolactone will polymerize when exposed to a small quantity of acidified water and form a polyester. Propose a structure for the resulting polymer!

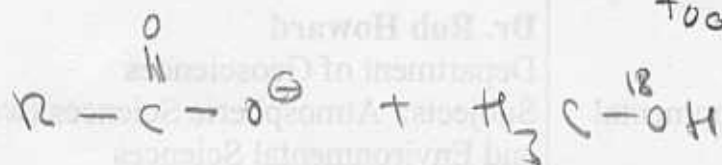
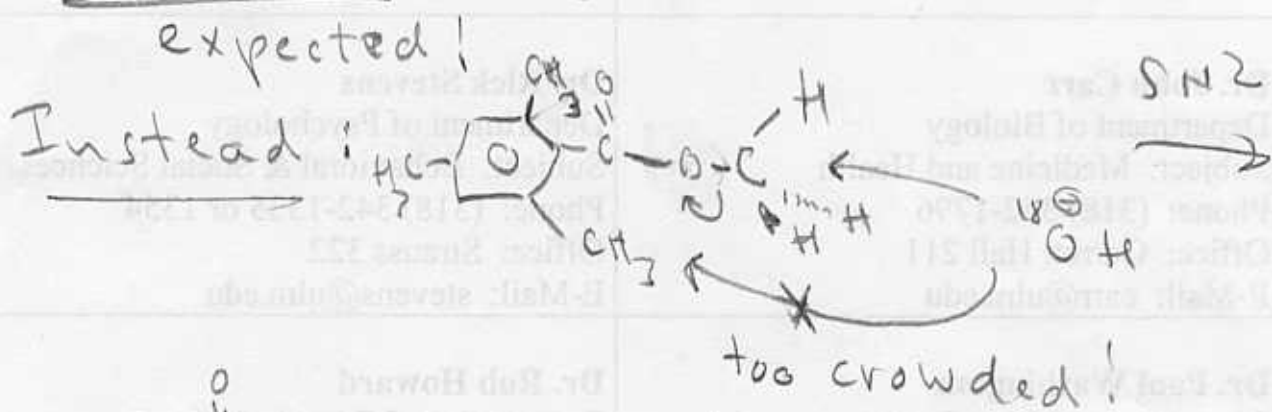
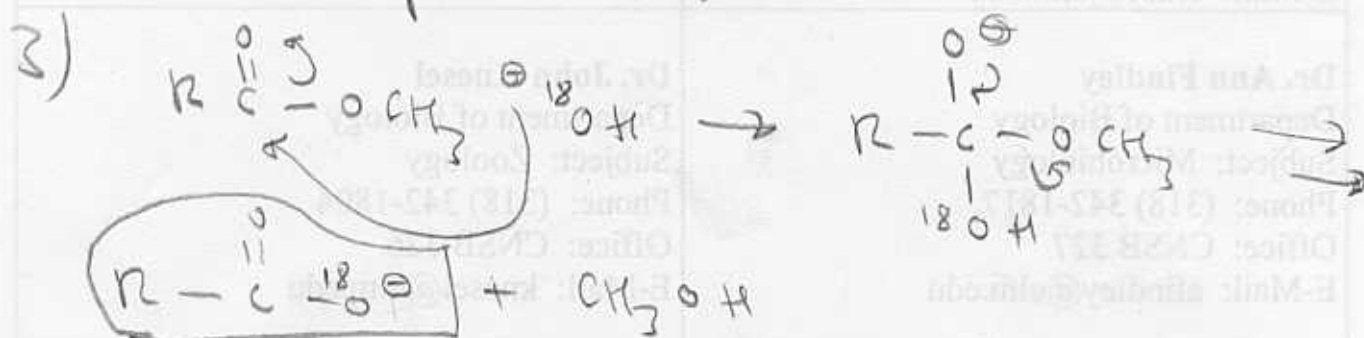
9. Provide mechanistic details for the synthesis of bromopropanoic acid from propanoic acid and PBr_3/Br_2 . Which isomer of bromopropanoic acid will you obtain?

Pr. 6 Key

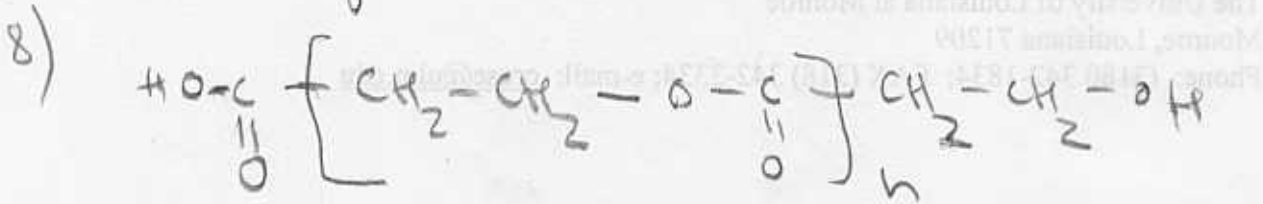
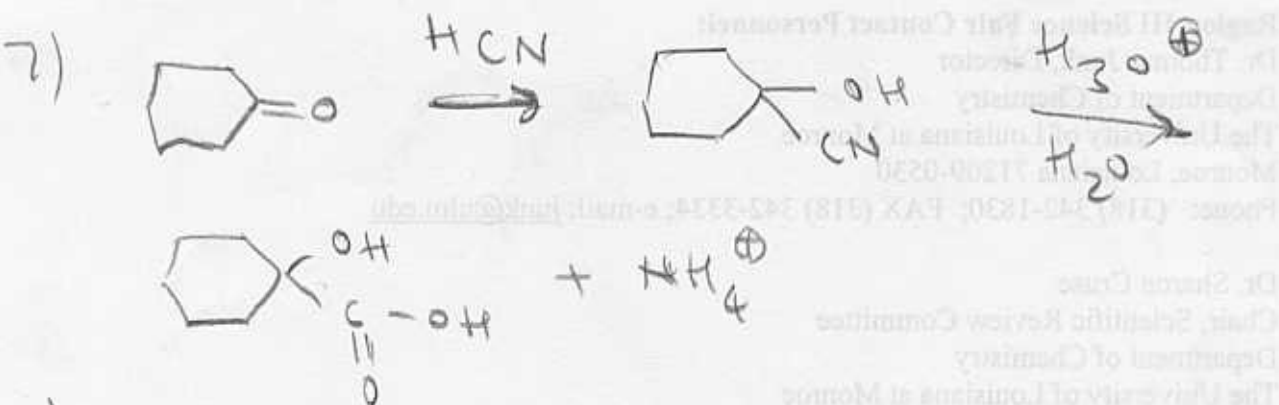
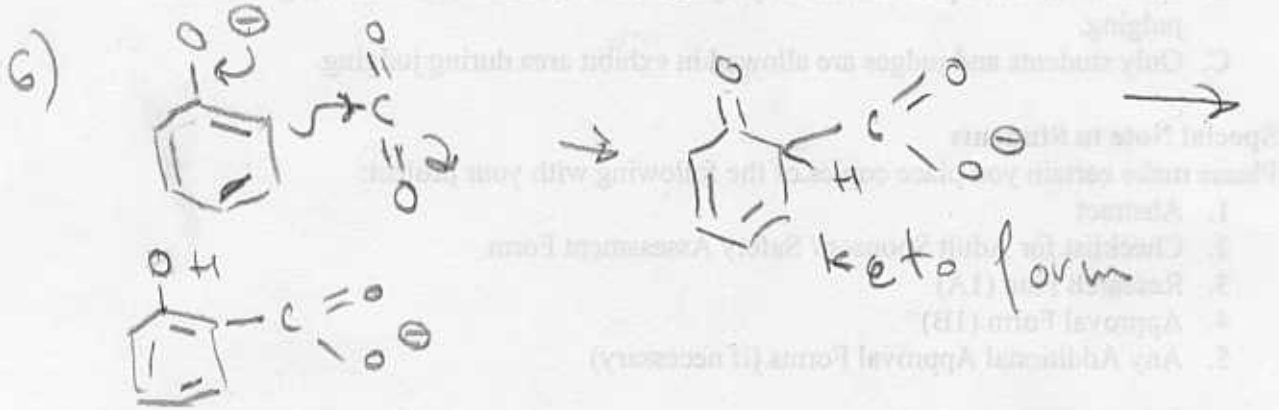
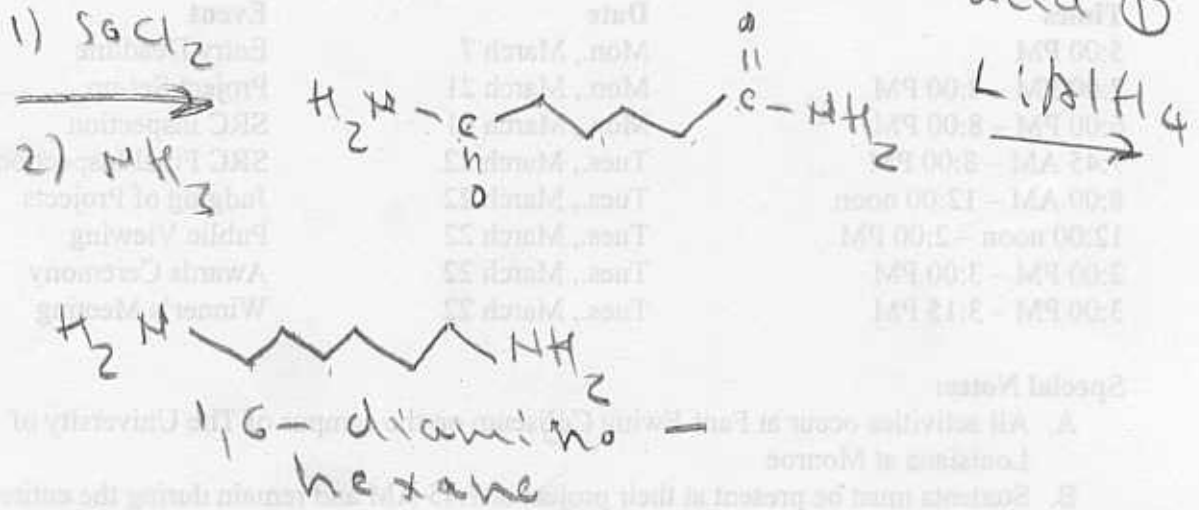
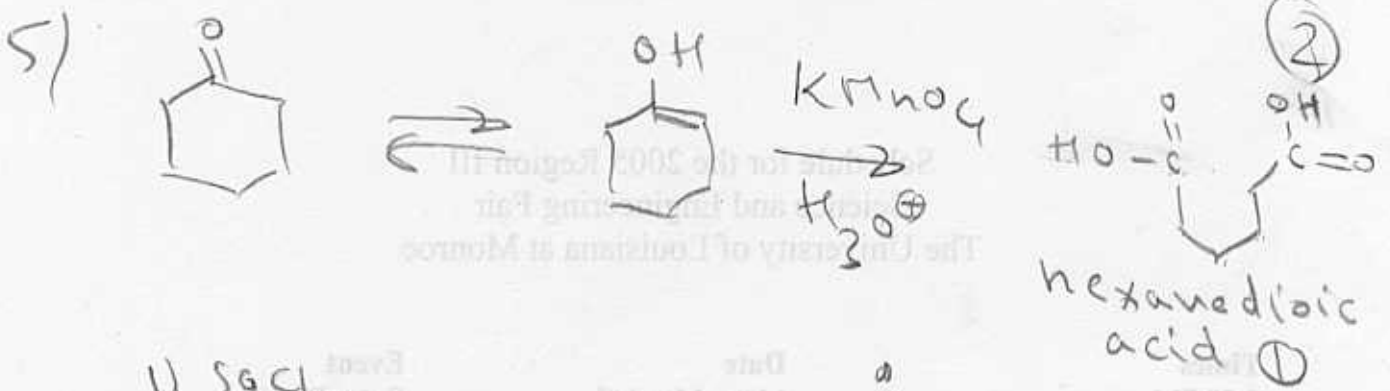
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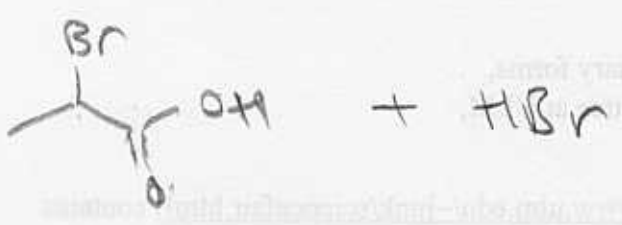
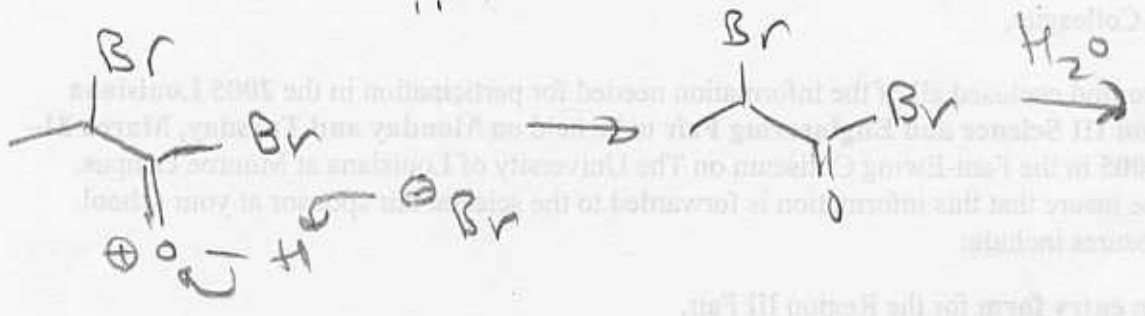
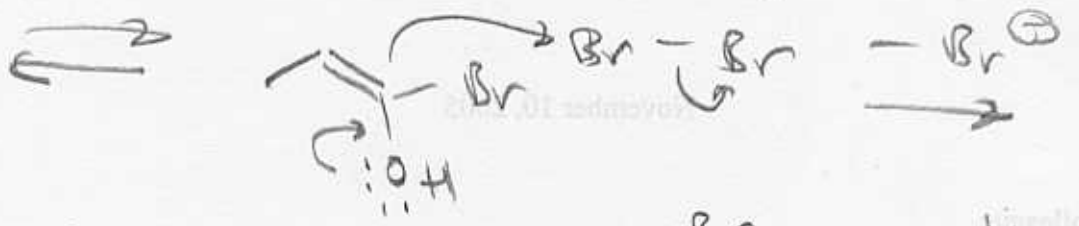
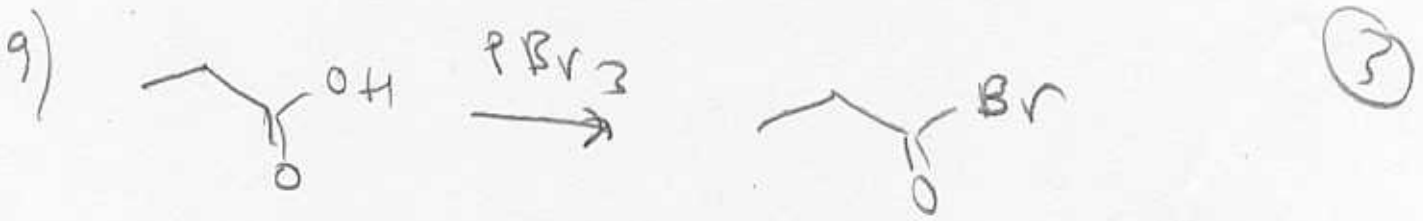
1) see problem set.

2)  this is a trans-esterification!



- 4) a) cyclohexyl benzoate
 b) benzene carboxamide ("benzamide")
 c) cyclopentane carboxylic acid
 d) propargyl chloride
 e) acetic formic anhydride
 f) phenylacetic acid





2-bromo propanoic acid

Respectfully,

 Dr. Thomas Junk, Director
 Louisiana Region III Science and Engineering Fair
 Baton Rouge