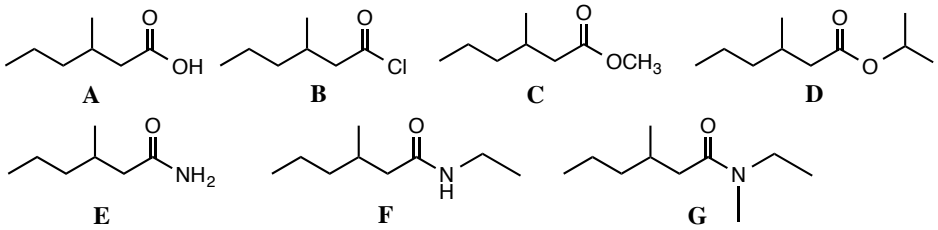
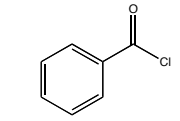
Chapter 21 Acid Derivatives
Practice Problems

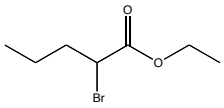
1. Provide the IUPAC names for the following series of related acid derivatives:



2. Provide the IUPAC names for the following compounds:



A



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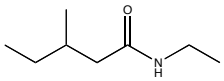

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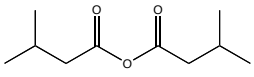
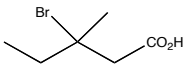
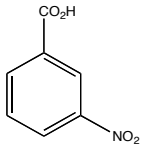


D

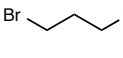


E

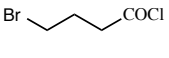


F

3. Abbreviated methods of drawing structures are very common, and you should recognize these common abbreviations. Name the following:



A



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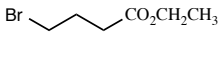

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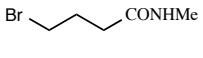

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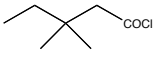

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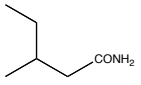

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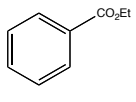
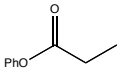
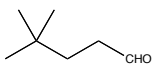


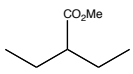
G



H

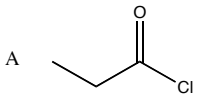


I



J

4. For each of the acid derivatives below, predict the product with the relevant reagents:

A 

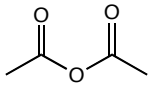
I EtOH, pyridine

II $(CH_3)_2NH$

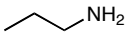
III H_2O

IV CH_3CO_2H, pyridine

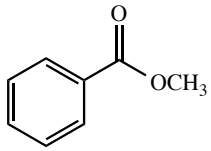
V benzene, $AlCl_3$

B 

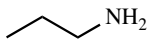
I 2-propanol, pyridine

II 

III NaOH, H_2O *or* H_3O^+

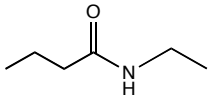
C 

I 1-propanol, H_2SO_4, heat

II 

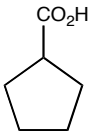
III NaOH, H_2O or H_3O^+, heat

IV 1. $LiAlH_4$
2. H_3O^+

D. 

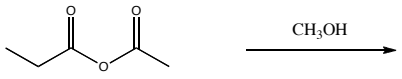
I 1. $LiAlH_4$
2. H_3O^+

II H_2SO_4, H_2O, heat *or* KOH, H_2O, heat

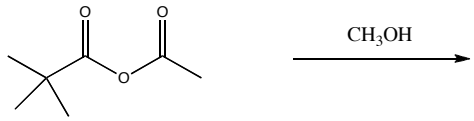
E. 

I CH_3CH_2OH, H_2SO_4, heat
II $SOCl_2$
III NaOH, H_2O

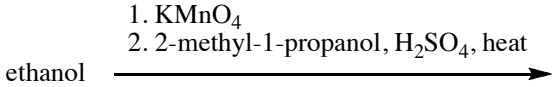
5. Typically symmetrical anhydrides are the most synthetically useful since otherwise two different products could result from their reaction. For example, show the mechanism for formation of two different esters starting from the unsymmetrical anhydride below ion its reaction with methanol:



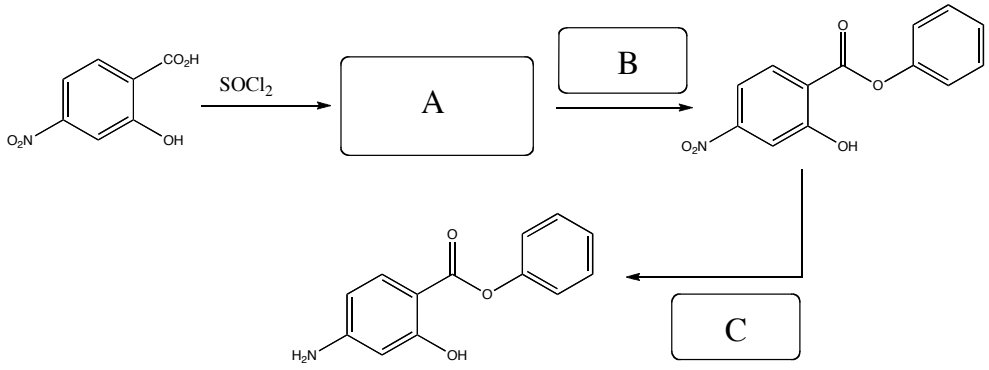
6. Unlike the anhydride in question 4, when the unsymmetrical ester below was treated with methanol, only one ester product was formed. What ester was formed and why?



7. An FDA-approved banana flavoring compound shown below can be made using the following reaction sequence. What are the intermediates in the process?



8. Phenyl 4-aminosalicylate is a drug used in the treatment of tuberculosis. Fill in any necessary reagents/structures involved in its synthesis from 4-nitrosalicylic acid below:



phenyl 4-aminosalicylate

9. Complete the reactions below as necessary: