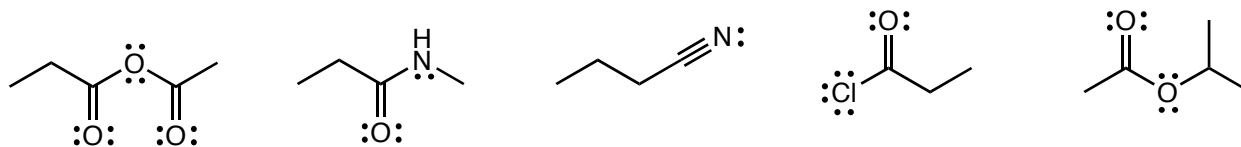


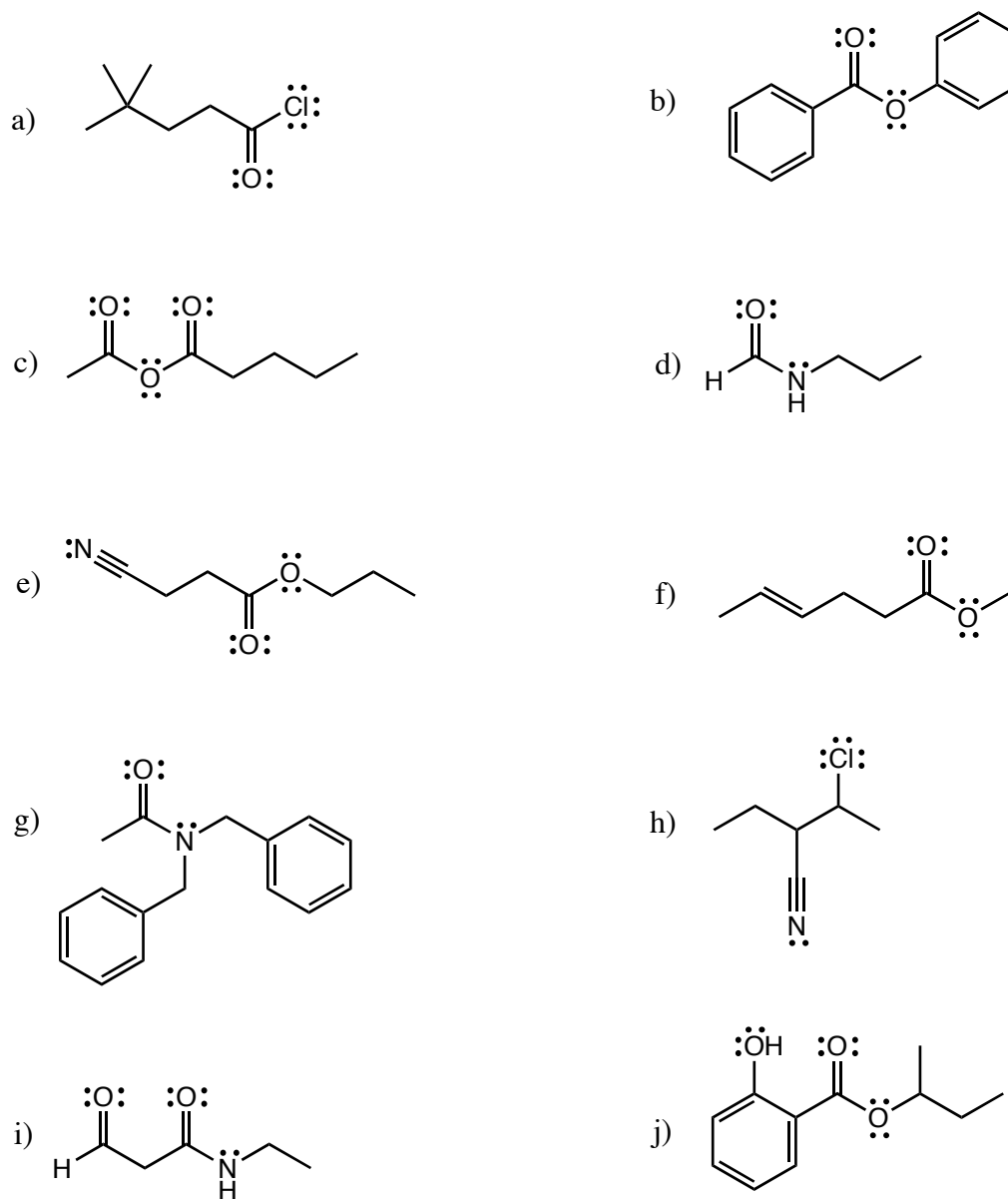
Homework for Chapter 24
Chem 2320

Name _____

1. Put the following in order of reactivity, the most reactive = 1.



2. Name the following compounds.



3. i) Identify the compounds whose NMR spectra are shown.
 ii) What IR bands would you expect each compound to have?

a) C_8H_7N

7.5 ppm (2H, d)

7.3 ppm (2H, d)

2.4 ppm (3H, s)

b) $C_7H_{12}O_3$

4.1 ppm (2H, q)

2.8 ppm (2H, t)

2.6 ppm (2H, t)

2.1 ppm (3H, s)

1.2 ppm (3H, t)

c) C_4H_9NO

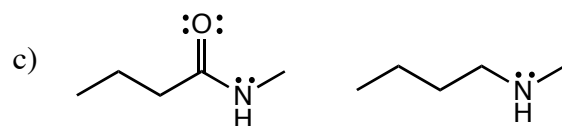
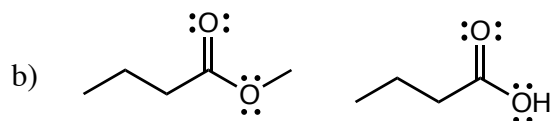
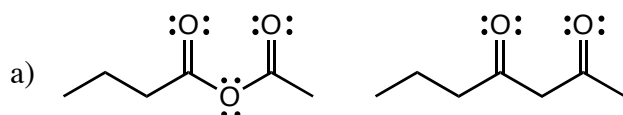
7.7 ppm (1H, singlet)

3.1 ppm (2H, quartet)

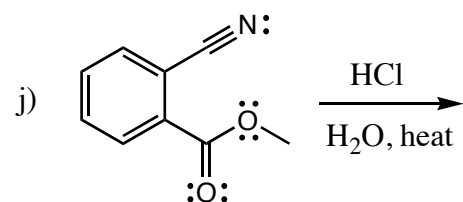
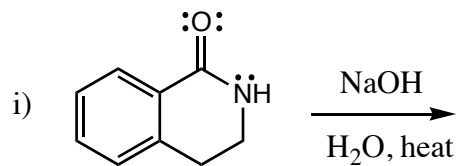
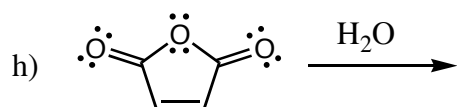
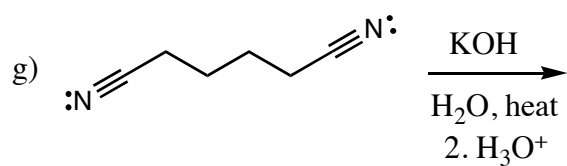
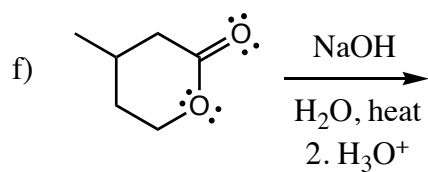
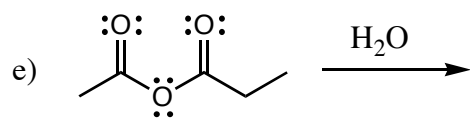
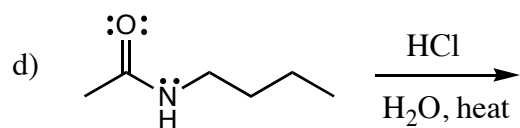
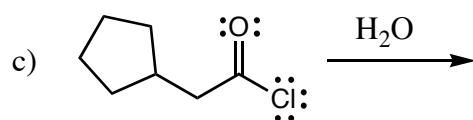
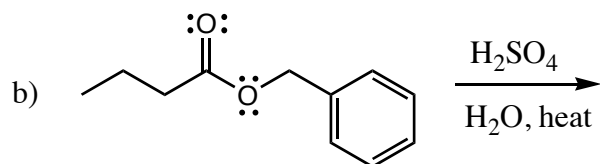
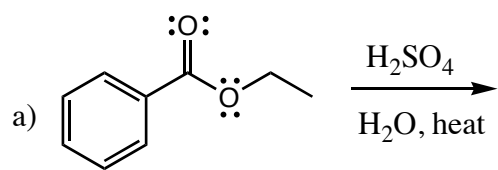
1.8 ppm (3H, singlet)

1.0 ppm (3H, triplet)

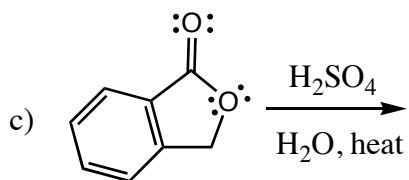
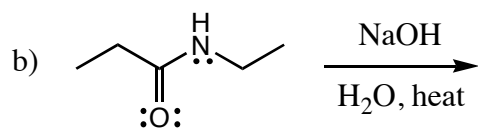
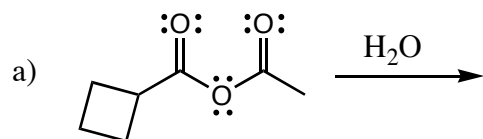
4. Explain how you would distinguish the following compounds by IR spectroscopy.



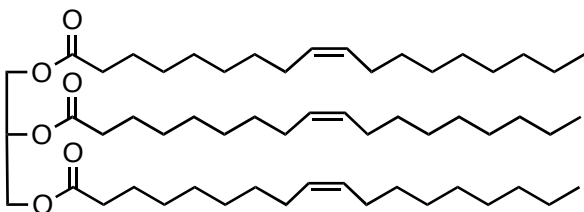
5. Give the products of the following hydrolysis reactions.



6. Give the mechanisms showing how each of the following starting materials would react to form products.



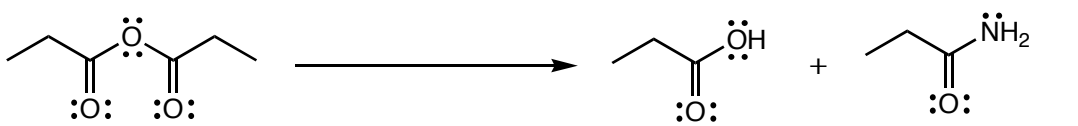
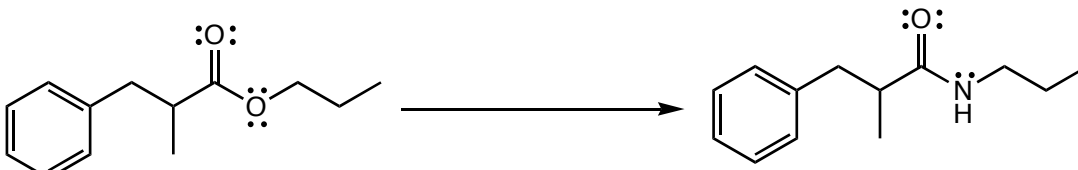
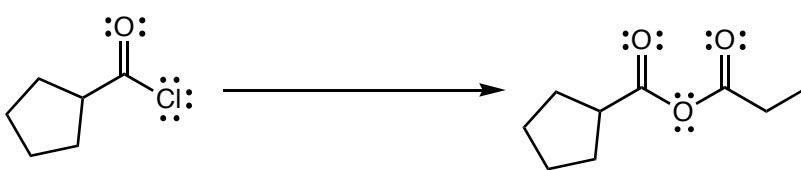
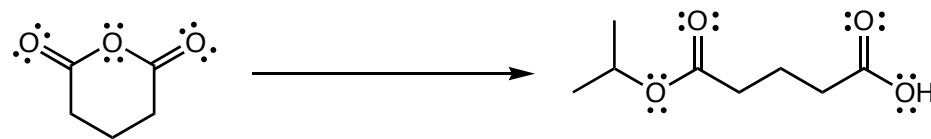
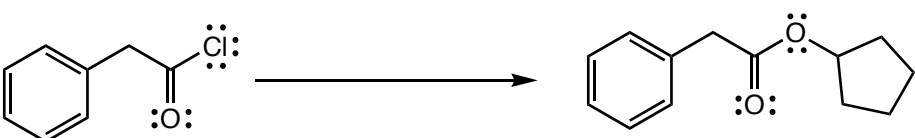
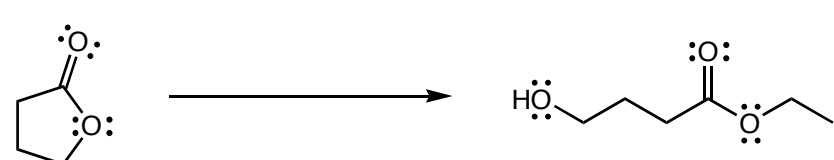
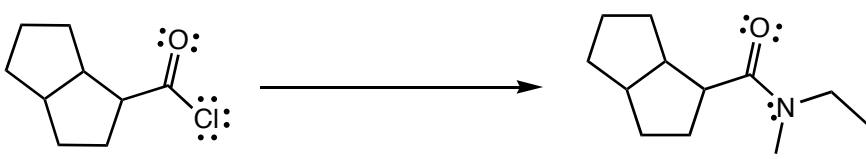
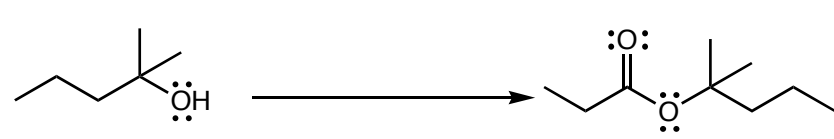
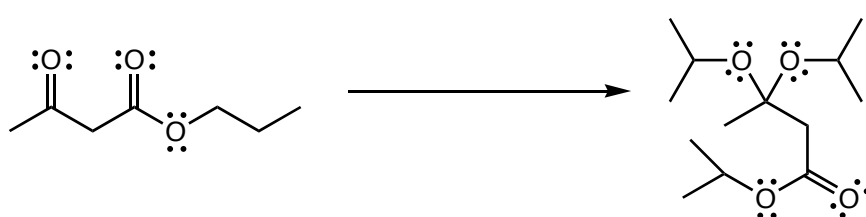
7. The structure of glyceryl trioleate, a major component of olive oil, is shown below.



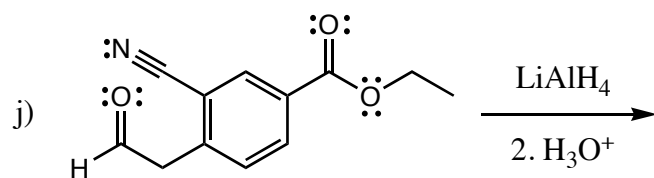
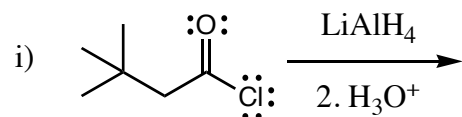
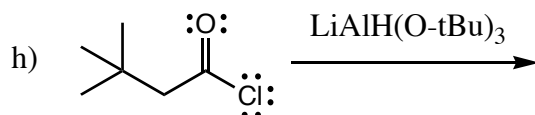
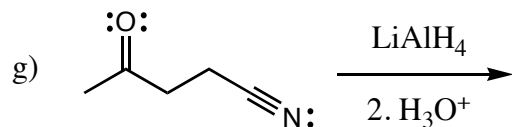
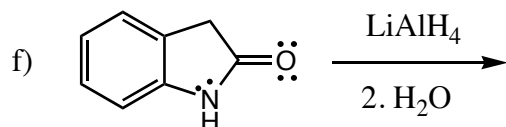
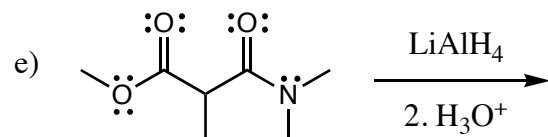
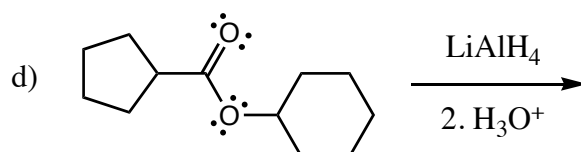
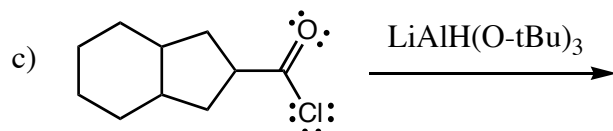
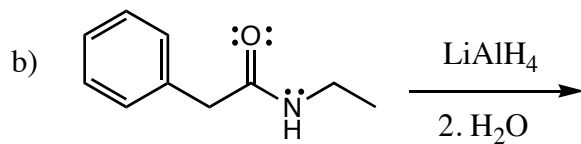
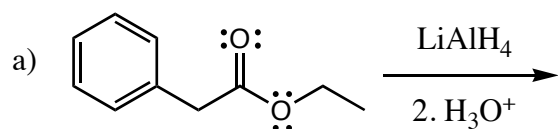
a) What products will result from saponification of this fat with aqueous NaOH?

b) What product will result from hydrogenation of this fat?

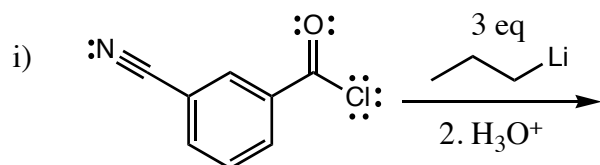
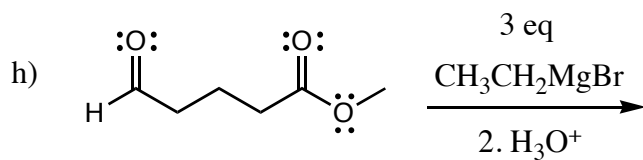
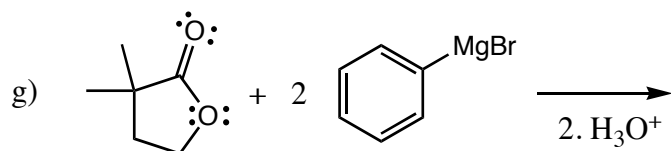
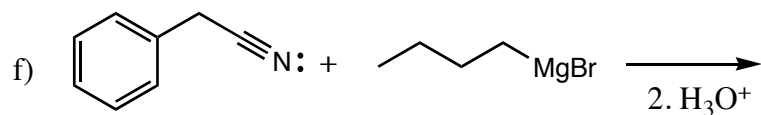
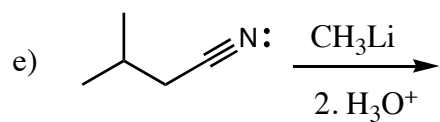
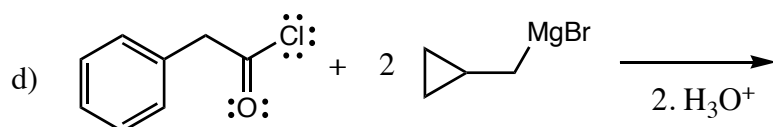
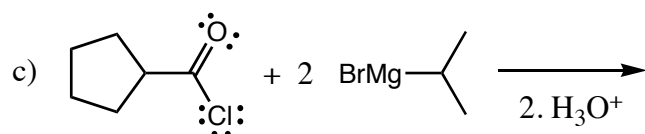
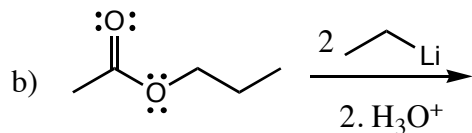
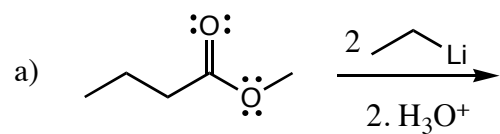
8. Give the reagents necessary to complete the following transformations in one step.

- a)  CCOC(=O)CC(=O)OCC >> CC(=O)CC(=O)OCC + CCC(=O)N
- b)  CCCNC(=O)C(C)Cc1ccccc1 >> CCCNC(=O)C(C)Cc1ccccc1
- c)  CCOC(=O)C1CCCC1 >> CCOC(=O)C1CCCC1
- d)  CCOC(=O)CC(O)C(=O)OCC >> CCOC(=O)CC(O)C(=O)OCC
- e)  CC1CCCC1OC(=O)CCc2ccccc2 >> CC1CCCC1OC(=O)CCc2ccccc2
- f)  CCOC(=O)CCO >> CCOC(=O)CCO
- g)  CCN(CC)C(=O)C12CCCCC1C2 >> CCN(CC)C(=O)C12CCCCC1C2
- h)  CCOC(=O)C(C)(C)CC >> CCOC(=O)C(C)(C)CC
- i)  CCOC(=O)CCC(=O)OCC >> CCOC(=O)CCC(=O)OCC

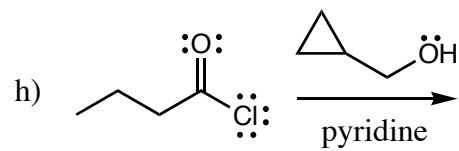
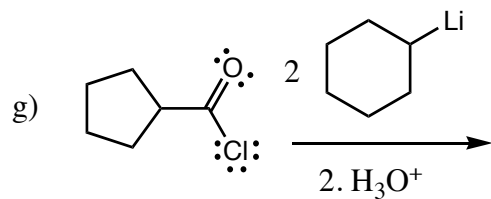
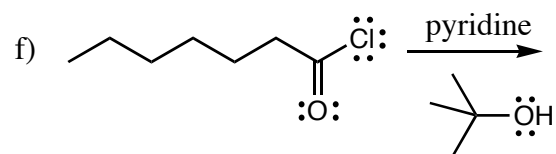
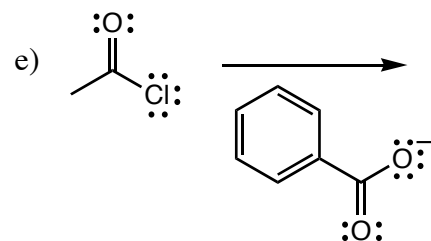
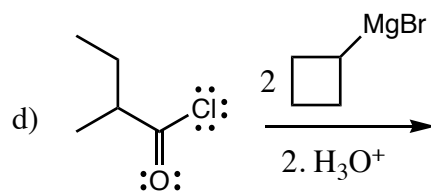
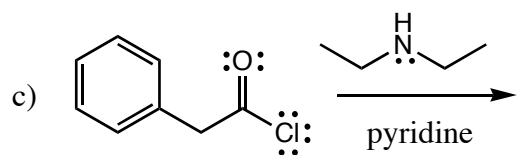
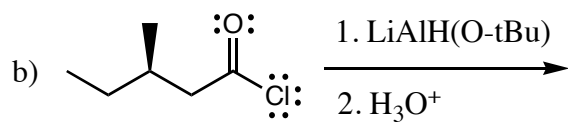
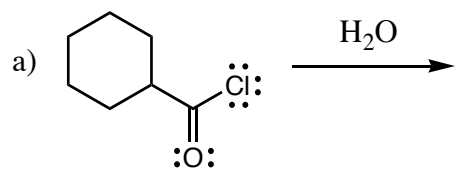
9. Give the products of the following reductions.



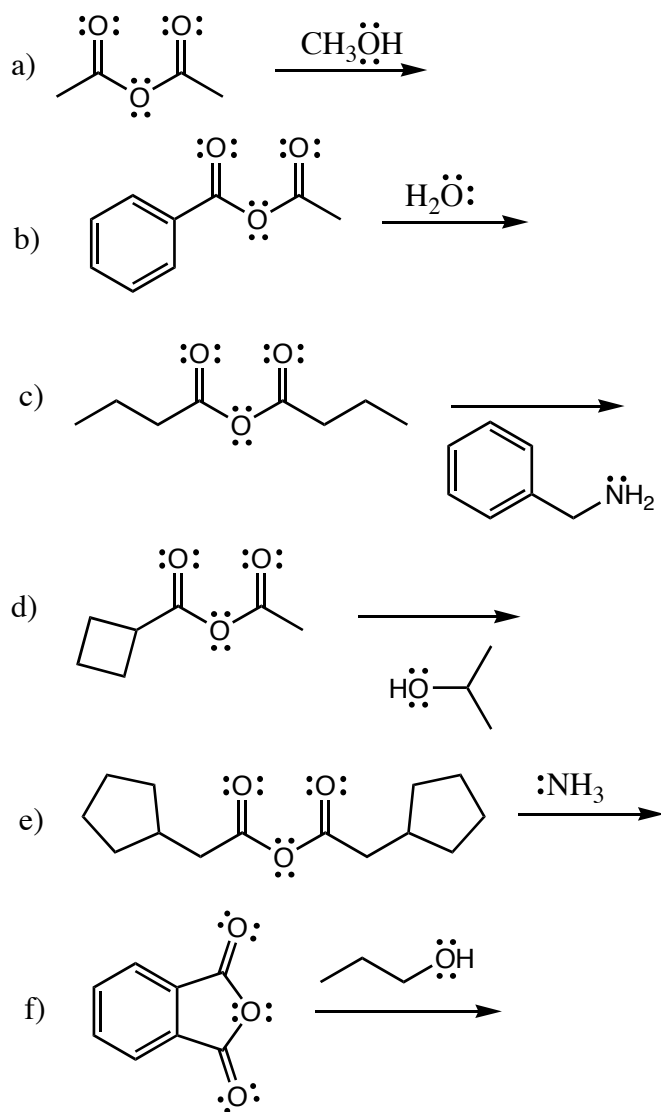
10. Give the products of the following reactions involving organometallic reagents.



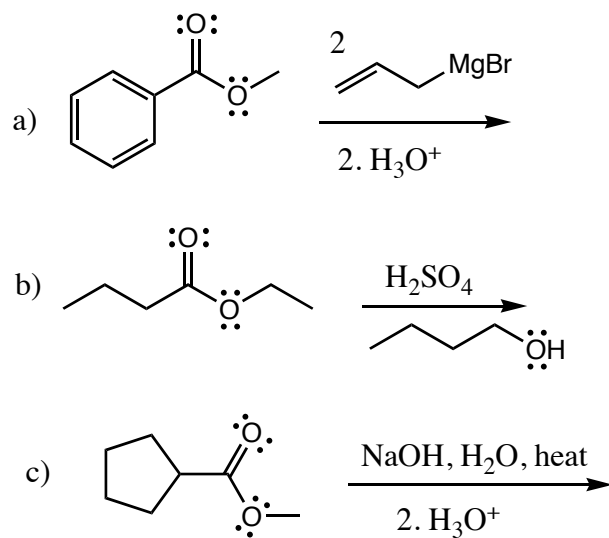
11. Give the products of the following reactions of acid chlorides.

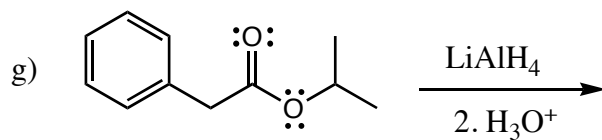
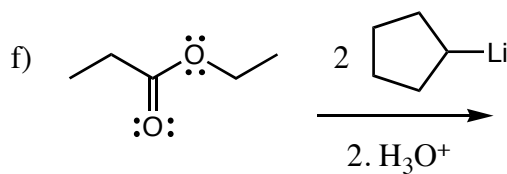
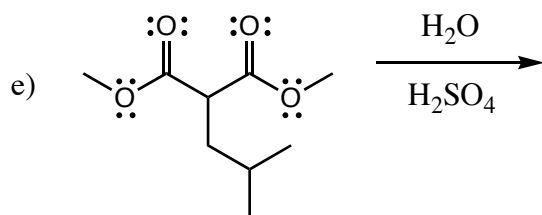
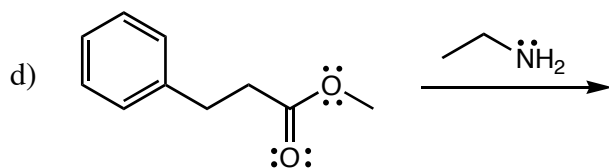


12. Give the products of the following reactions with anhydrides.

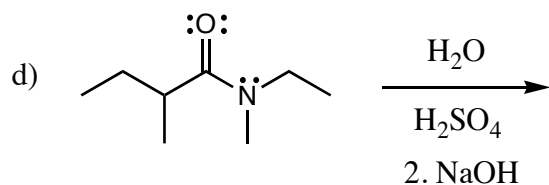
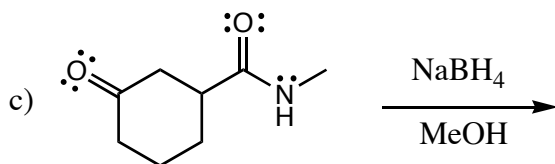
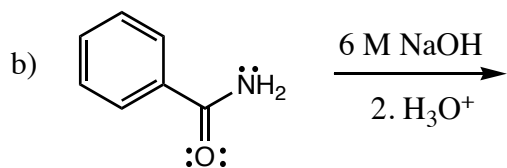
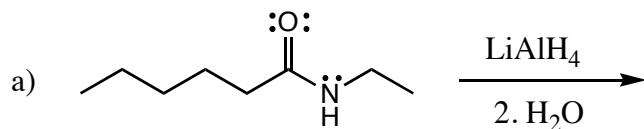


13. Give the products of the following reactions of esters.

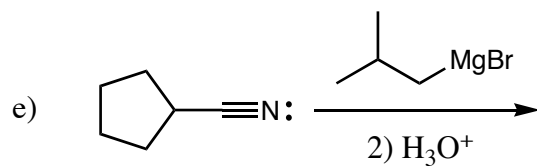
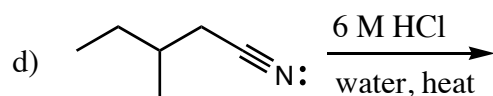
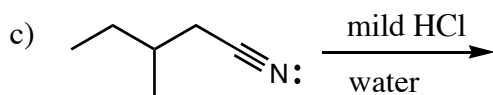
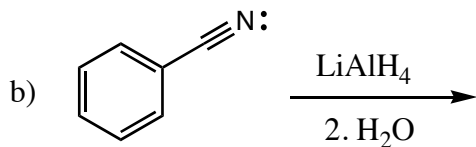
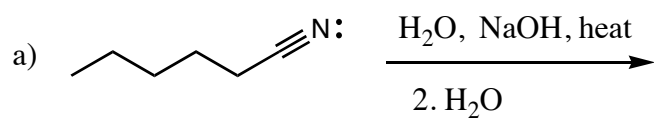




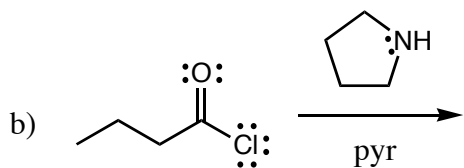
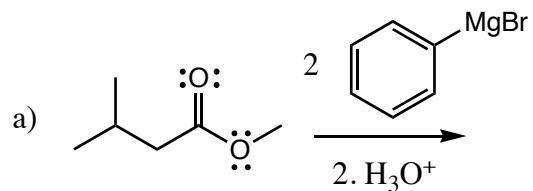
14. Give the products of the following reactions with amides.



15. Give the products of the following reactions of nitriles.



16. Draw the mechanism for the following reactions.



17. Write a reaction sequence (starting materials, reagents, and products) in which the following steps are accomplished, with only one set of reagents per step (the only permissible second step is 2. H_3O^+ or 2. H_2O). You will need to use some reactions from previous chapters. Avoid generation of isomers where possible. Do not invent any new reactions!

a) carboxylic acid $\rightarrow$ acid chloride $\rightarrow$ amide $\rightarrow$ amine

b) carboxylic acid $\rightarrow$ anhydride $\rightarrow$ ester $\rightarrow$ 3° alcohol

c) acid chloride $\rightarrow$ ketone $\rightarrow$ alkene $\rightarrow$ alkyl halide

d) ketone $\rightarrow$ cyanohydrin $\rightarrow$ 2-hydroxy carboxylic acid

e) acid chloride $\rightarrow$ aldehyde $\rightarrow$ amine

f) carboxylic acid $\rightarrow$ ester $\rightarrow$ 1° alcohol $\rightarrow$ ether

g) anhydride $\rightarrow$ carboxylic acid and amide $\rightarrow$ alcohol and amine