Homework Chapter 22
Chem 2320

Name _____

1. Fill in the blanks of the following statements.

_____ fatty acids contain one carbon-carbon double bond.

Fats are esters of glycerol and three _____.

_____ and _____ are essential fatty acids needed in the diet.

The process of _____ gets rid of C=C's and makes liquid fats into solid fats.

Partial hydrogenation can create _____ which are unnatural and may be detrimental to health.

Soap works by forming _____ in which the organic tails are on the inside and the carboxylate heads are on the outside.

Some good sources of omega-3 fatty acids are _____.

2. Draw structures for the following compounds.

a) Trichloroacetic acid

b) 2-methylmalonic acid

c) 3-cyclopentylpentanedioic acid

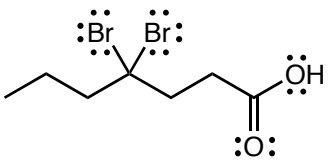
d) m-chlorobenzoic acid

e) Z-3-hexenoic acid

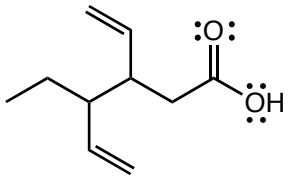
f) 1-methylcyclopentanecarboxylic acid

3. Name the following compounds.

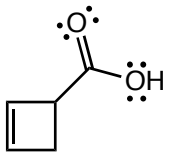
a)



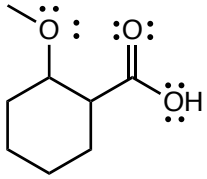
b)



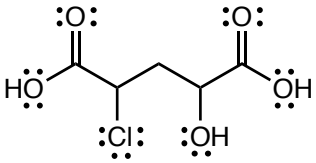
c)



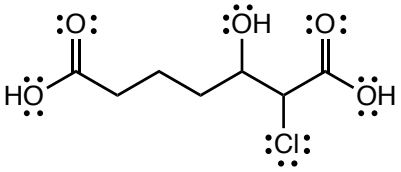
d)



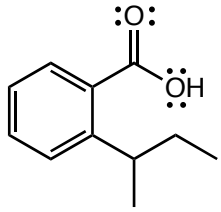
e)



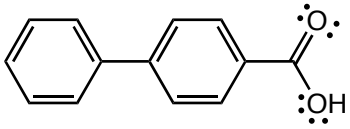
f)



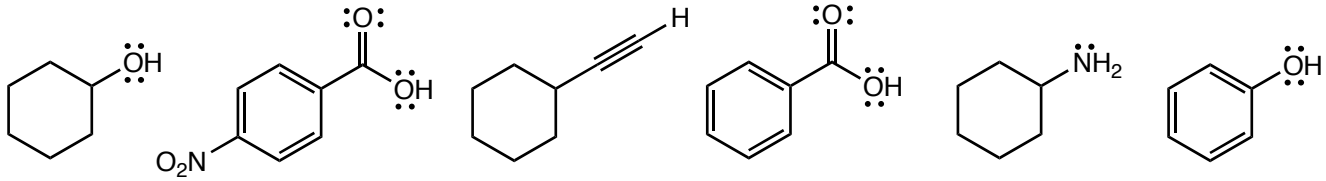
g)



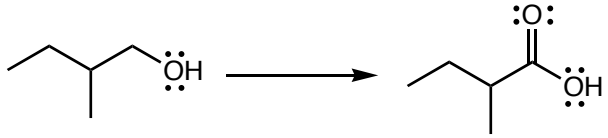
h)

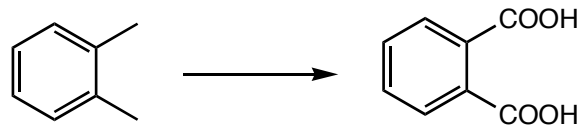


4. Give the pK_a of each of the following compounds <u>as acids</u> and rank them in order of <u>decreasing</u> acidity.

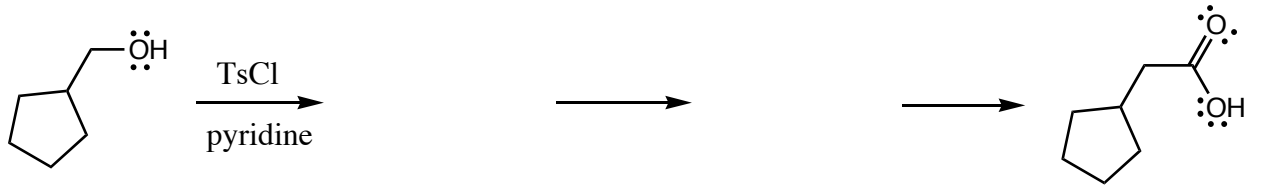


5. Circle any of the following compounds which can form hydrogen bonds with water. Then draw a square around any of the compounds which can form hydrogen bonds with itself.

c) 

d) 

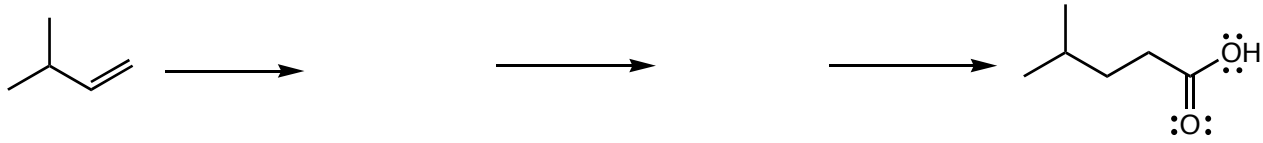
e) 

f) 

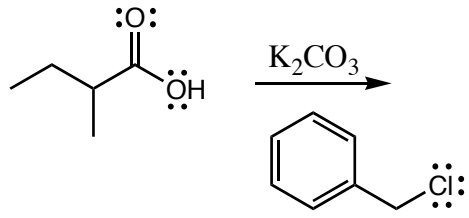
g) 

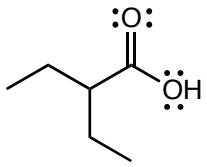
i) 

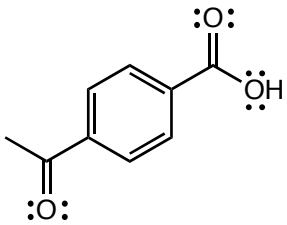
j) 

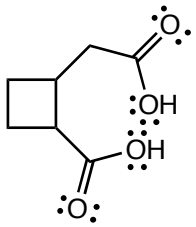
k) 

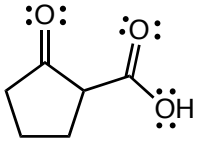
9. Give the products of the following reactions.

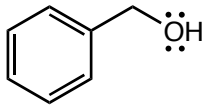
a) 

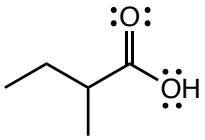
b)  $\xrightarrow{SOCl_2}$

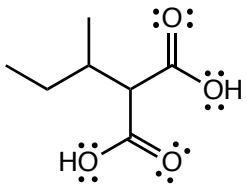
c)  $\xrightarrow[2.\ H_3O^+]{1.\ LiAlH_4}$

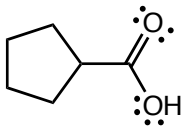
d)  $\xrightarrow{heat}$

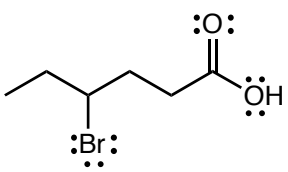
e)  $\xrightarrow{heat}$

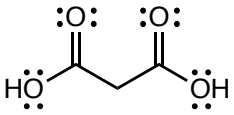
f)  $\xrightarrow[\text{acetic acid}]{H_2SO_4}$

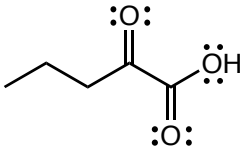
g)  $\xrightarrow{P_4O_{10}}$

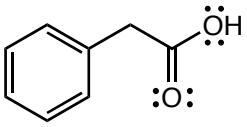
h)  $\xrightarrow{heat}$

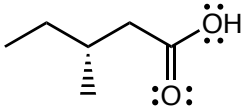
i)  $\xrightarrow[\text{isobutyl alcohol}]{H_2SO_4}$

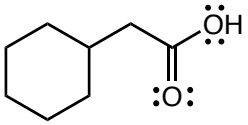
j)  $\xrightarrow[2.\ Li\\3.\ H_3O^+]{1.\ NaOH}$

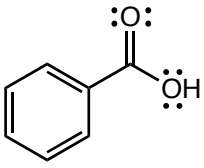
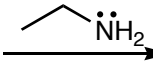
k)  oxalyl chloride →

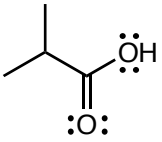
l)  heat →

m)  1. K_2CO_3 → 2. CH_3CH_2MgBr 3. H_3O^+

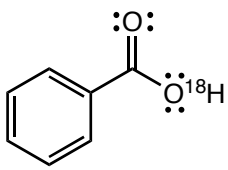
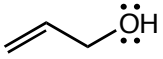
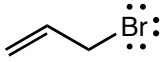
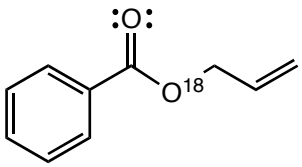
n)  CH_2N_2 → ether

o)  1. $LiAlH_4$ → 2. H_3O^+

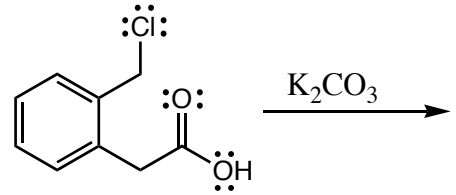
p)   → heat

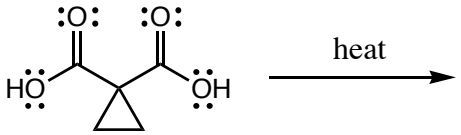
q)  Na_2CO_3 → CH_3I

10. Which of the following reactions will give the desired isotopically labeled compound? Hint: consider the mechanism of both reactions. Explain your choice!

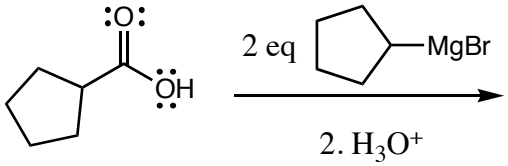
 H_2SO_4 →  or K_2CO_3 →  

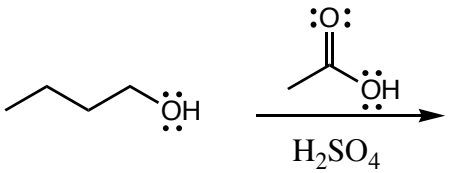
11. Show the step-by-step mechanism for the following reactions. Account for all electron pairs, charges, etc.

a) 

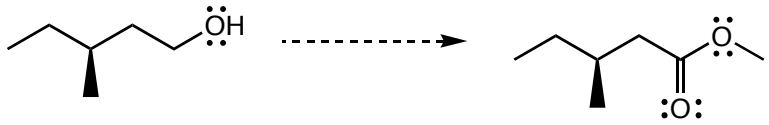
b) 

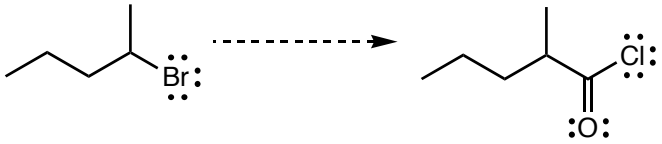
(1st step only)

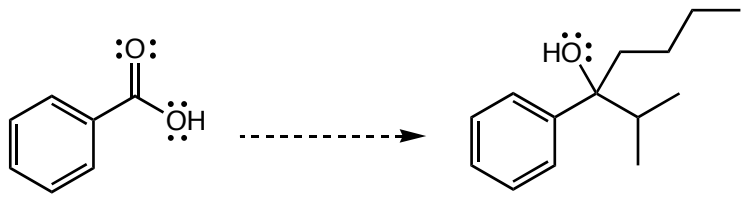
c) 

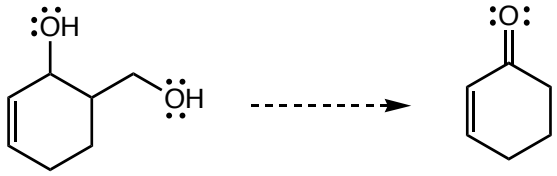
d) 

12. Show a reaction sequence (reagents and products) that will accomplish the following transformations. Reactions from previous chapters will be used.

a) 

b) 

c) 

d) 

e)