

# Ester Hydrolysis And Transesterification

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from chapter(s) \_\_\_\_\_ in the recommended text

## A. Introduction

## B. Reactivity

less

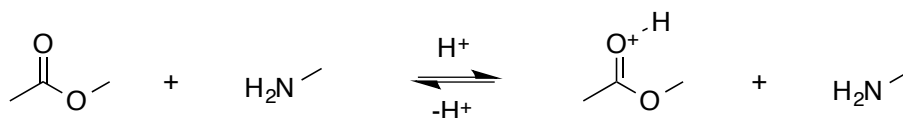
less

do not

more

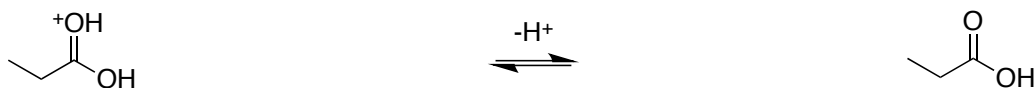
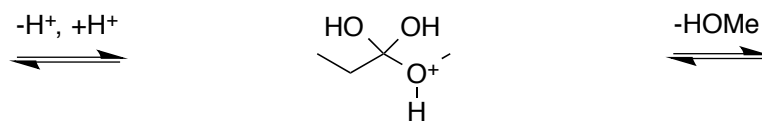
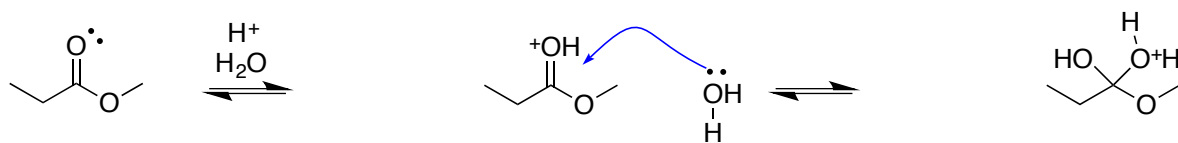
more

unlikely.

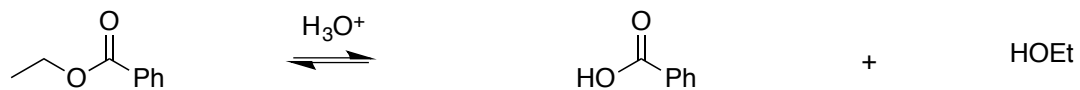
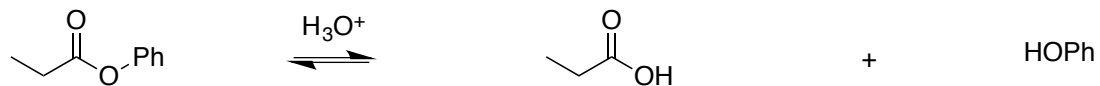
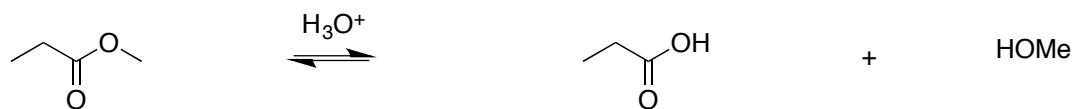


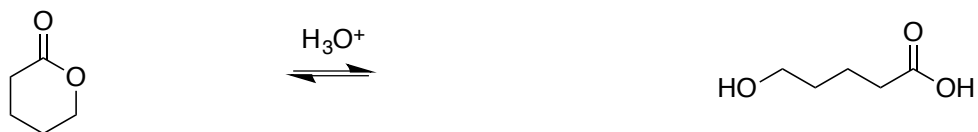
are not

## C. Acid-mediated Hydrolysis

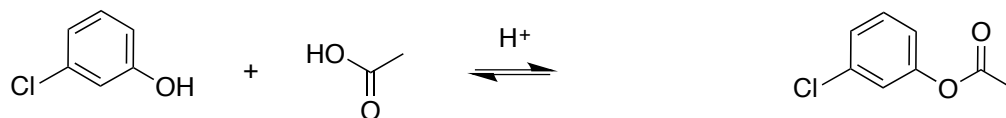
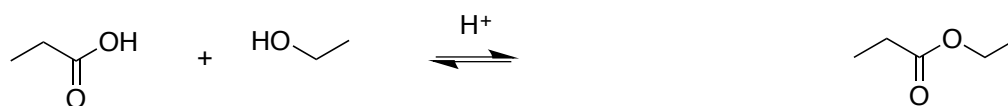


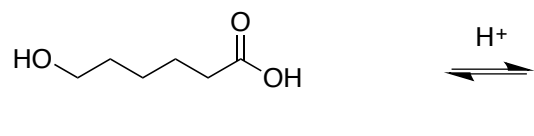
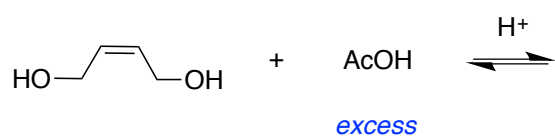
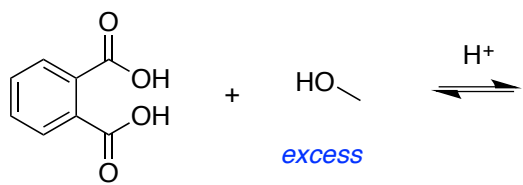
carboxylic acids  
water.

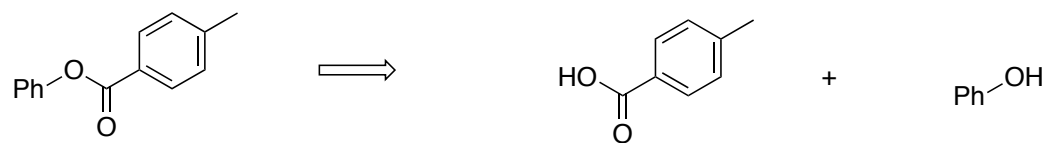
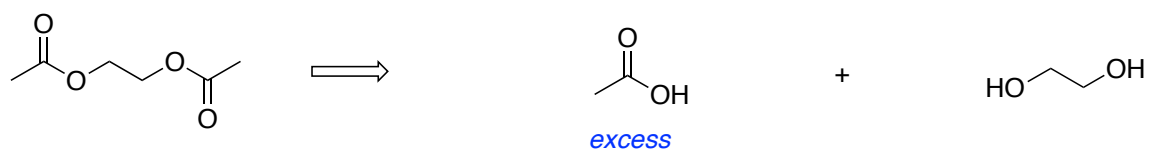
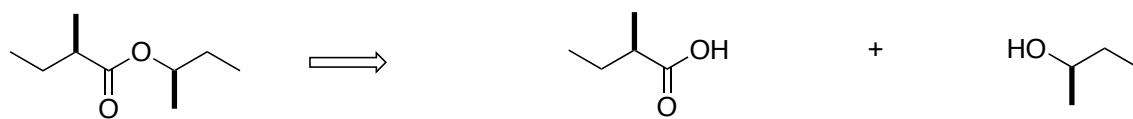


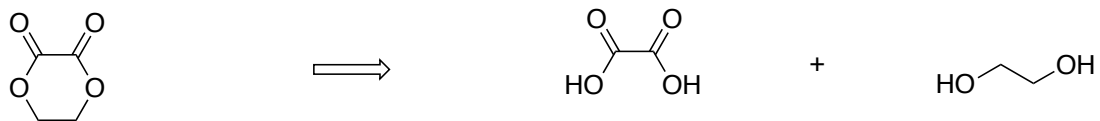


*reversible,*







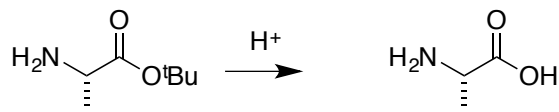
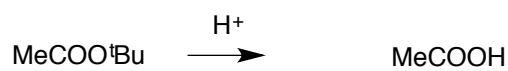
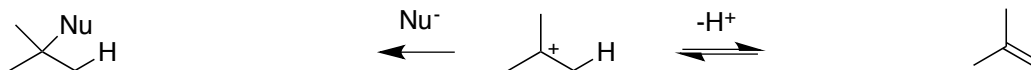


possibilities: forming a five-membered ring is more favorable than three- or four-membered ring due to ring strain of  $sp^3$  carbons.

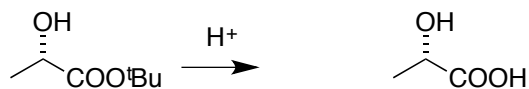
### Hydrolysis Of *tert*-Butyl Esters Occurs Via A Different Mechanism

*stable*  
*without*



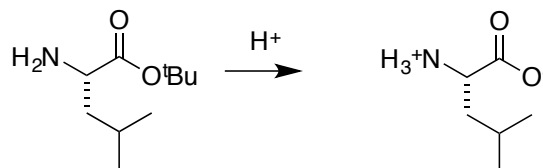
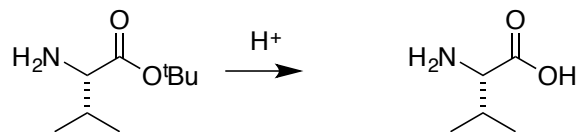


*alanine*



*lactic acid*

*glycine*

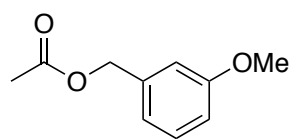


*valine*

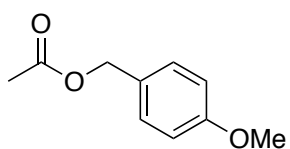
*leucine*

*carbocation.*

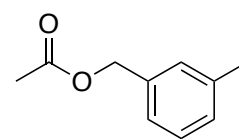




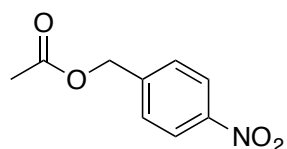
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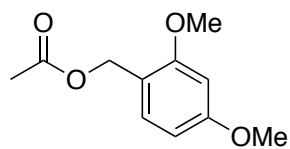
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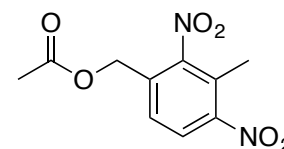
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5



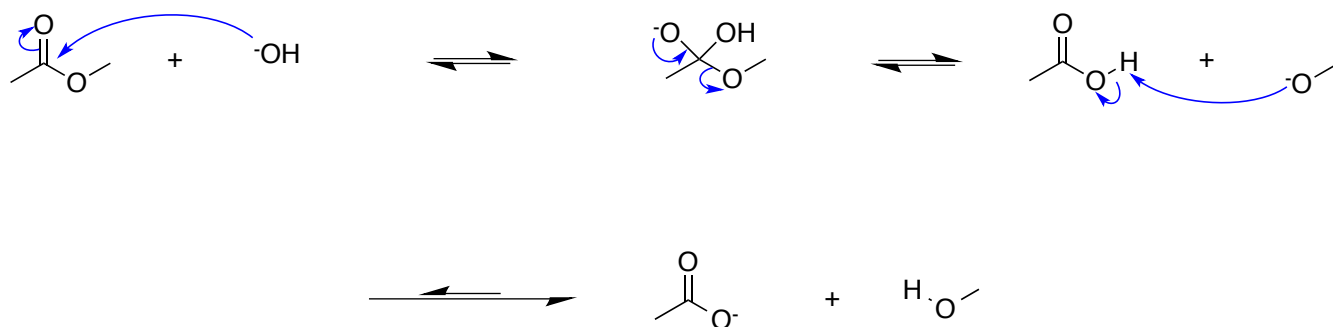
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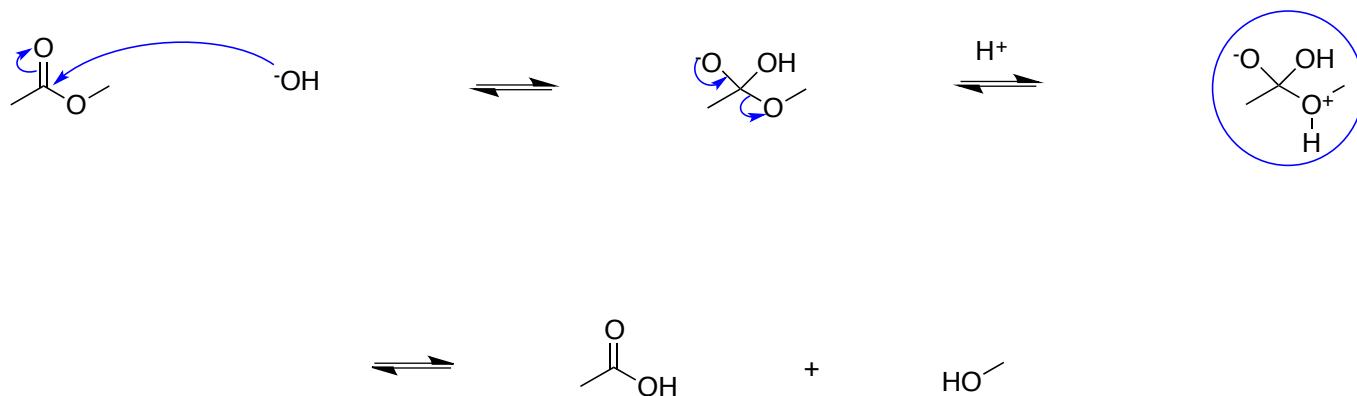
6

## D. Base-mediated Hydrolysis

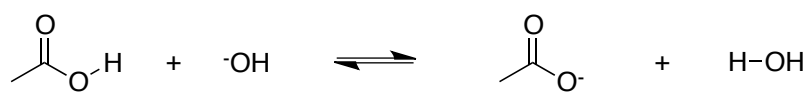
### Mechanism



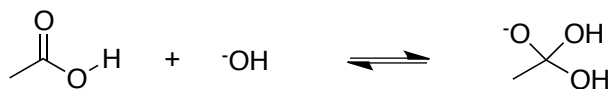
*irreversible*  
*reversible.*



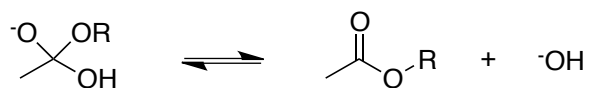
*likely.*

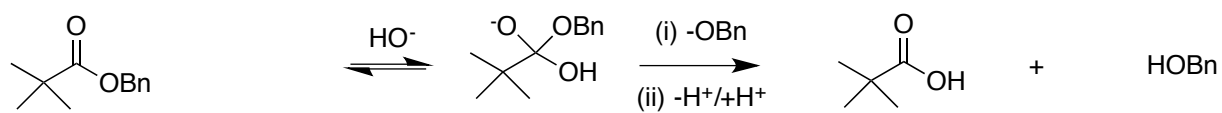
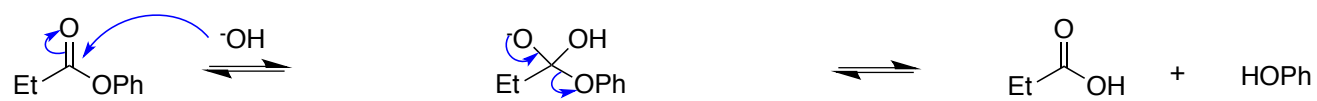


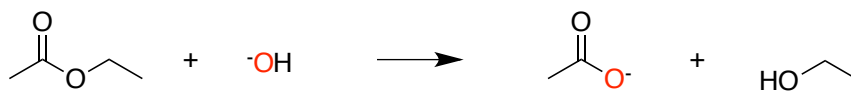
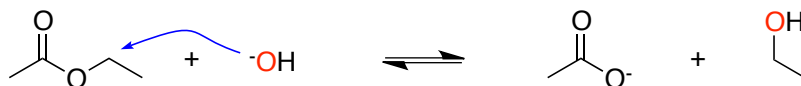
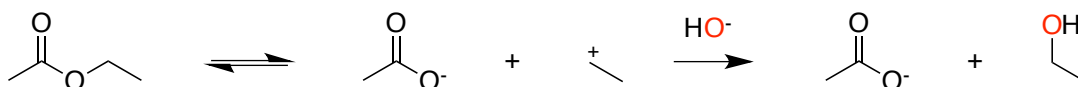
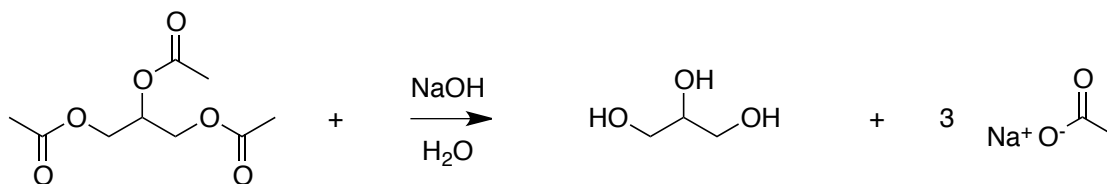
*unlikely.*

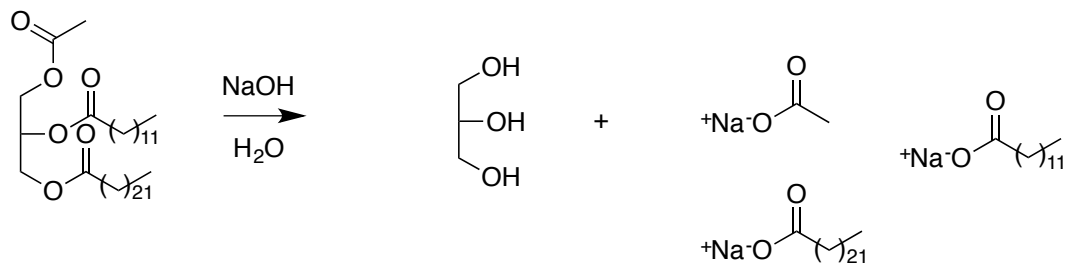
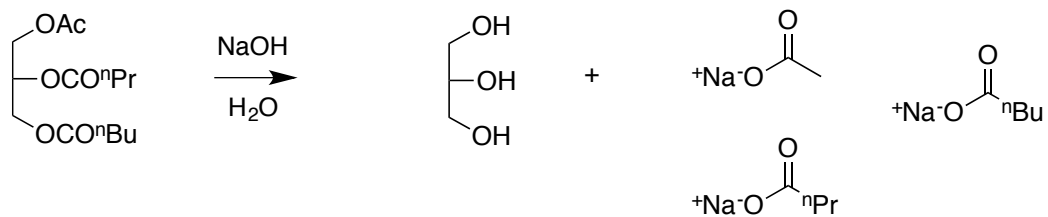


*likely.*

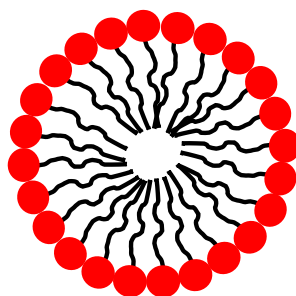




<sup>18</sup>O*would not**would not**can**soaps*



are: Particles that aggregate in the solution with the hydrophilic "head" regions in contact with surrounding solvent and the hydrophobic single-tail regions are in the micelle center.

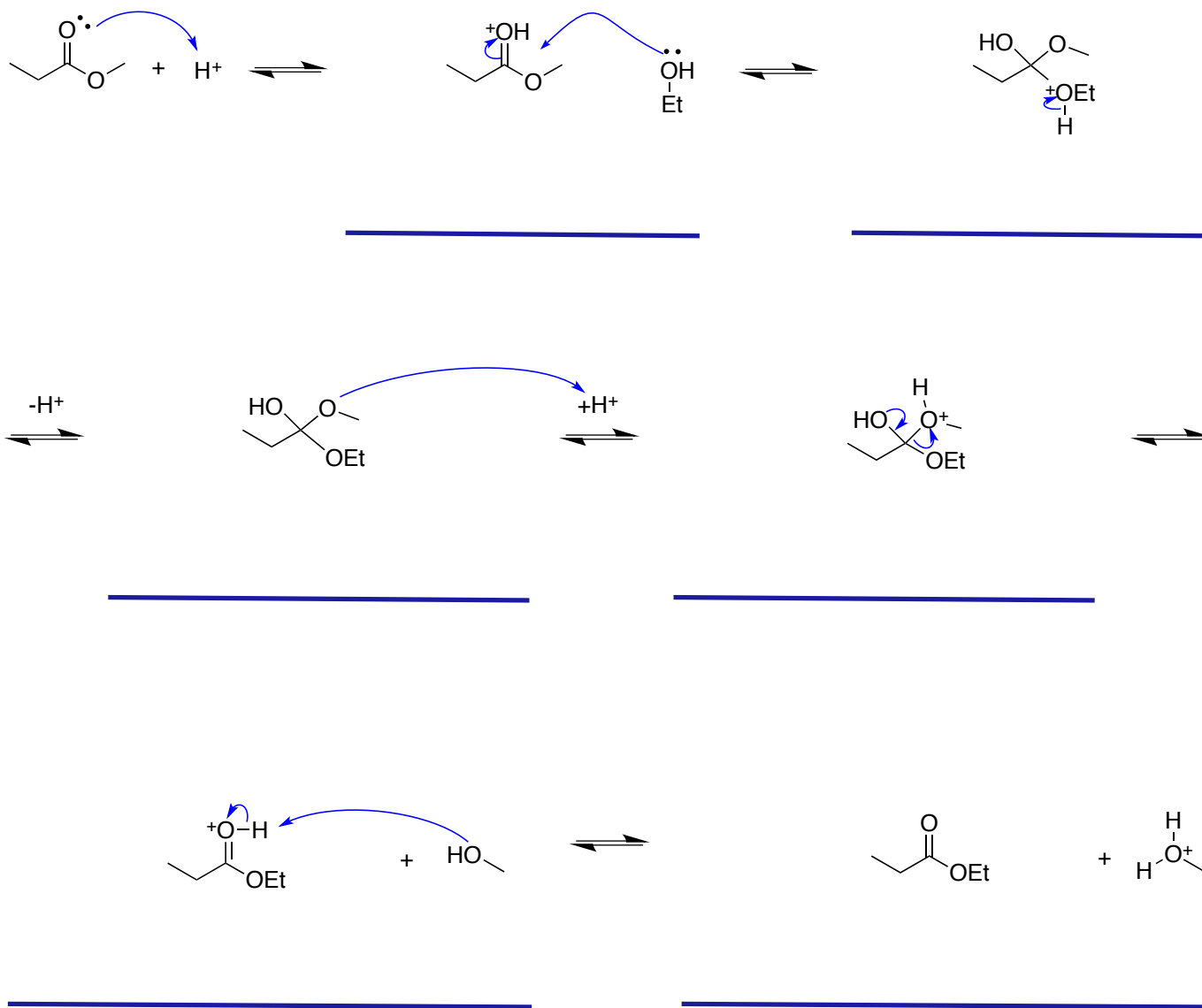


cartoon of a micelle

## E. Transesterification Reactions

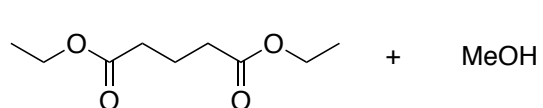
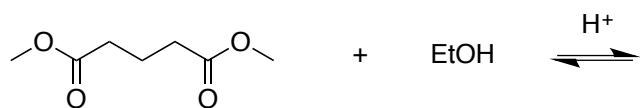
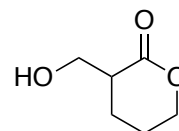
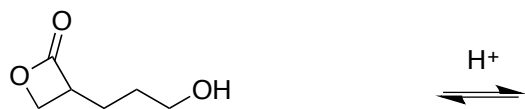
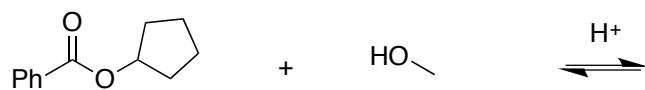
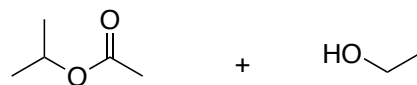
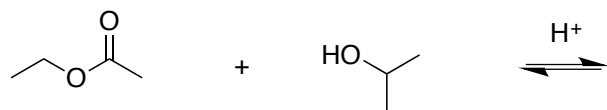
### Mechanism Under Acidic Conditions

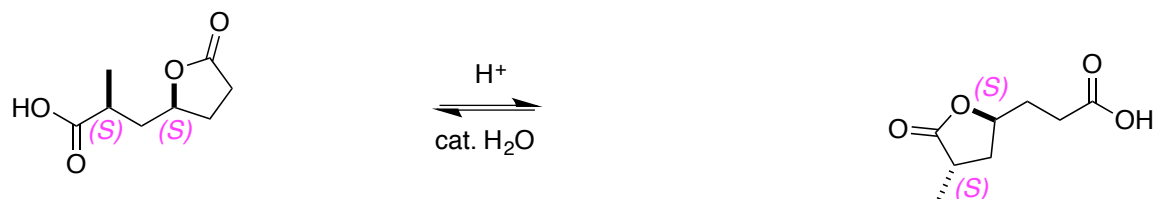
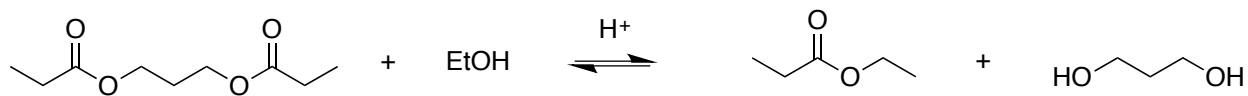
*another ester.*



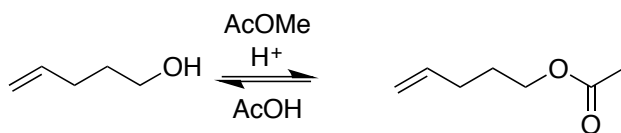
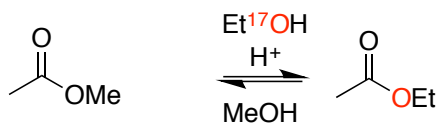
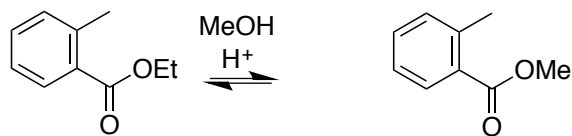
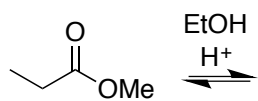
## Examples Of Transesterifications

*alkoxide*





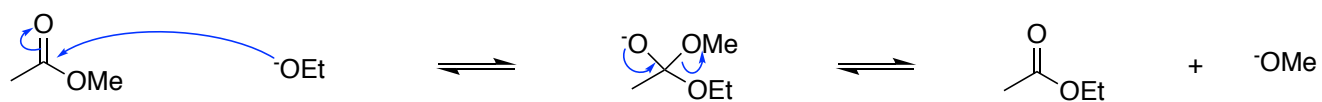
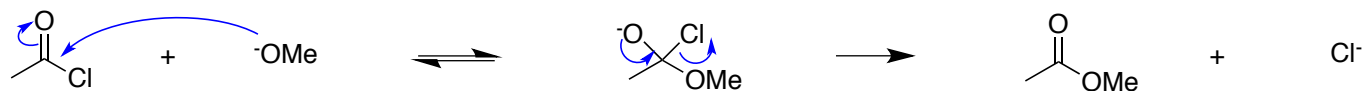
*check by assigning (R)- or (S)-configurations*





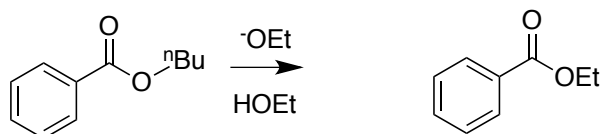
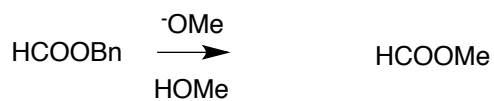
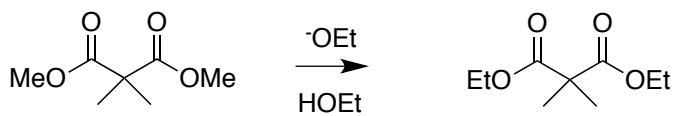
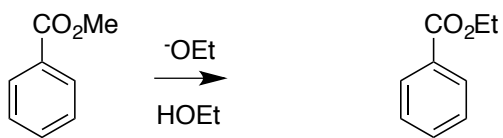
## Mechanism Under Basic Conditions

*alkoxides.*



*show arrows*

## Examples Of Base-Mediated Transesterifications



*more  
sp<sup>3</sup>-  
would not*

## **F. Ester Hydrolyses In Biochemistry In The Central Nervous System**

*esterases.*

*acetylcholinesterase.*

*acetylcholine receptors  
choline.*

*ACHE  
paralysis.*

*nerve gases.*

## **In The Digestive System**

*long chain alkyl groups*

*triglyceride*

*catalysts.*

*neutral*

*nucleophiles*

*electrophiles.*

*can*

*metabolism of triglycerides*

*transesterifications.*

*lipases.*