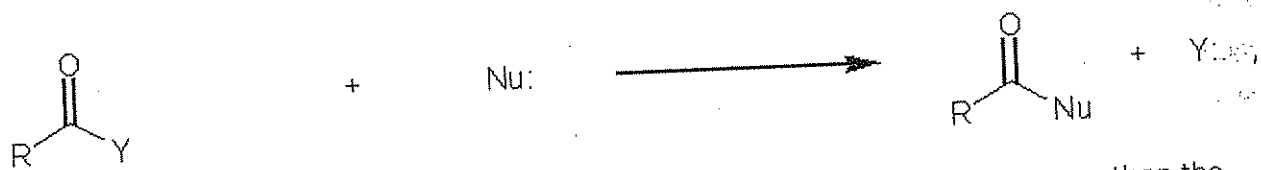


[Back to Study Aids]

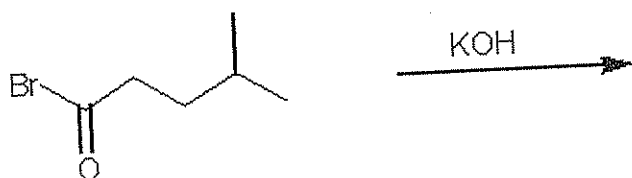
Please note that on 3/3/00 I gave an acid type mechanism for the addition of HCN. This is the mechanism that one would write under acid conditions. In your textbook, Loudon writes the best mechanism as though the cyanide is adding first. This is because the way the reaction is done best is under basic conditions. The HCN is generated by the addition of sulfuric acid to an excess of a sodium or potassium cyanide. Under these conditions there is free cyanide. This is the approach Loudon is taking.

### III. Addition of Nucleophiles to Carboxylic Acid Derivatives Under Basic Conditions

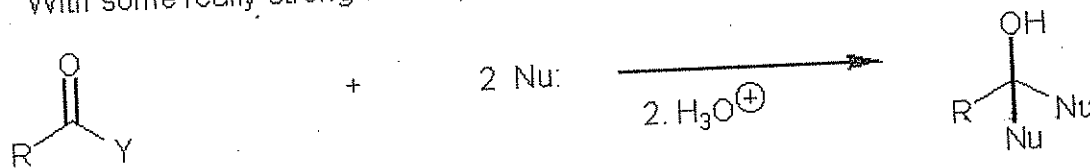


Y = things like X, OCOR or OR, normally a weaker base or better leaving group than the incoming nucleophile

Try to write a mechanism for the following reaction:

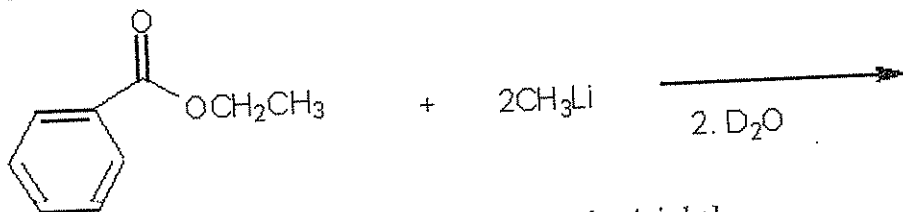


Please note that the weakest bond breaks first with the nucleophilic attack. With some really strong nucleophiles, the nucleophile will react twice as shown below....



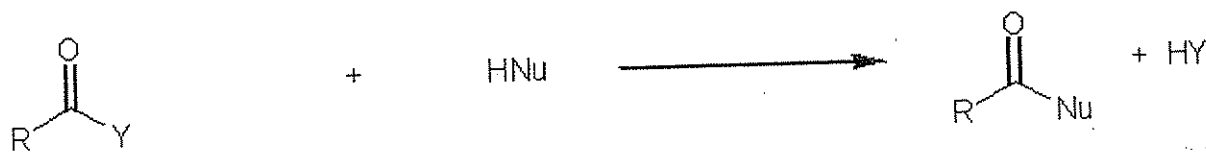
Y = things like X, OCOR or OR, normally a weaker base or better leaving group than the incoming nucleophile

Using the above as a model, write a mechanism for the following organolithium reaction.



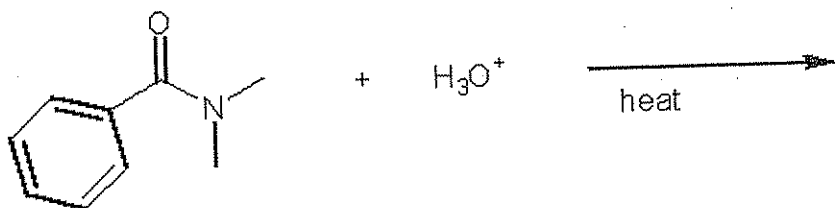
BacktoStudyAids

V. Addition of Nucleophiles to Carbonyl Compounds Under acidic Conditions

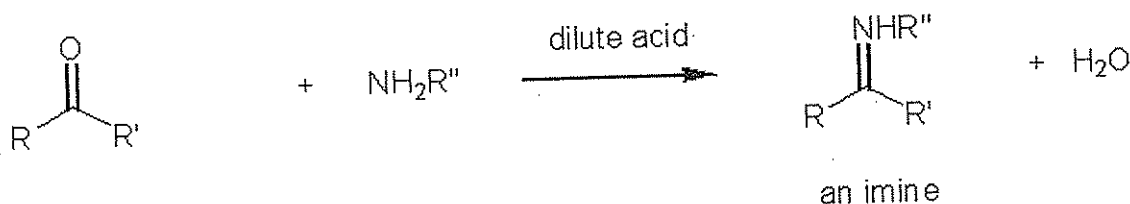


Y = things like X, OCOR, OR, or NR<sub>2</sub>

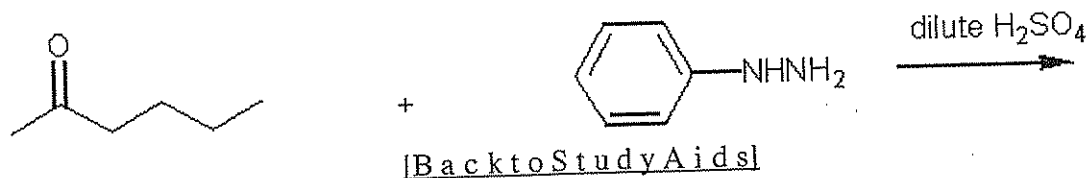
Write the product for the following reaction. Can you write a mechanism? Remember it is under acidic conditions.....



V. Reaction of Aldehydes and ketones with amines.....



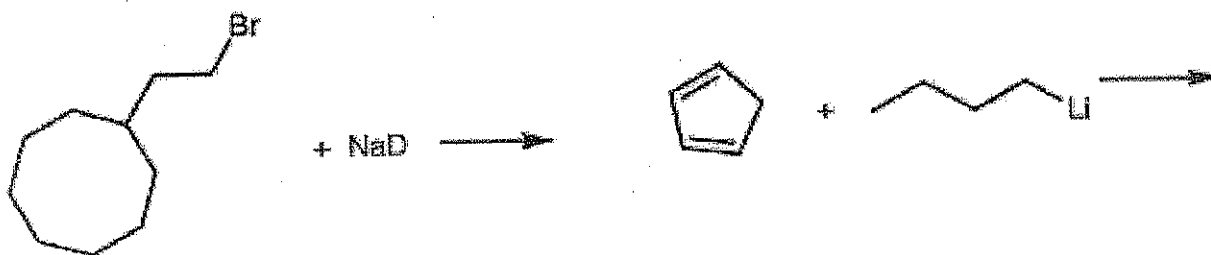
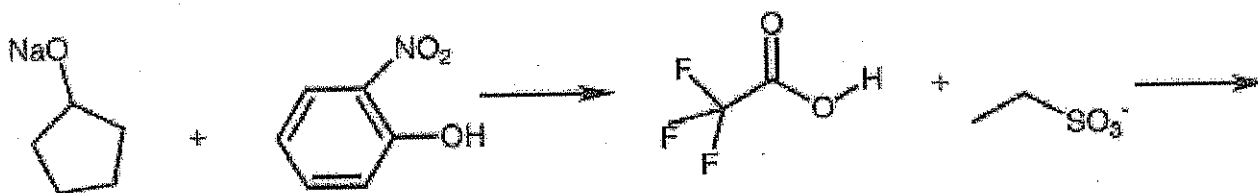
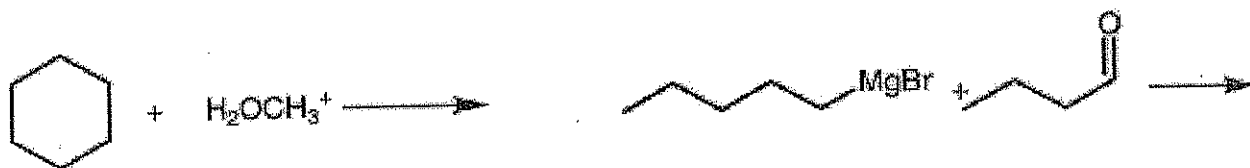
Try to write a logical mechanism for the following reaction. As in all these reactions, the mechanism proceeds through a tetrahedral intermediate.



## Carboxylic Acid Derivatives - Summary

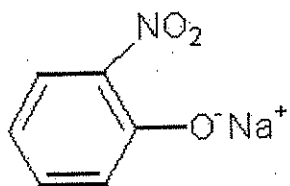
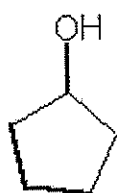
Name of Derivative In order of Reactivity	Reaction with Water	Reaction with Amine	Reaction with Alcohols	Reaction with LAH	Reaction with Organometallic Reagents
Acyl Halide RCOCl	$\text{H}_2\text{O}, \text{Na}_2\text{CO}_3$				
Acid Anhydride	$\text{H}_2\text{O}$				
Ester	$\text{H}_3\text{O}^+$ or $\text{OH}^-$ -aq				
Amide	$\text{H}_3\text{O}^+$ or $\text{OH}^-$ -aq				
Nitrile	$\text{H}_3\text{O}^+$				

## Flash Cards Sheet no. 1

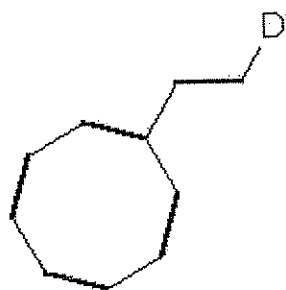


Flash Cards no. 1 - Products Answers are in their relative positions on the cards

No Reaction - There is nothing to protonate in the cycloalkane

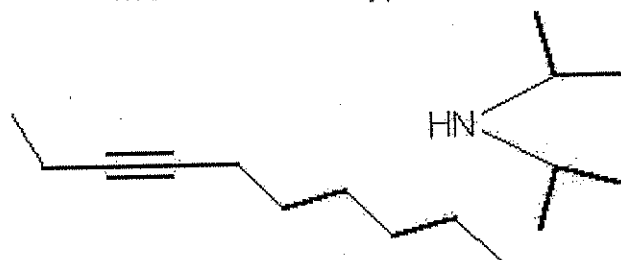


The second structure has resonance stabilization - can you draw structures?

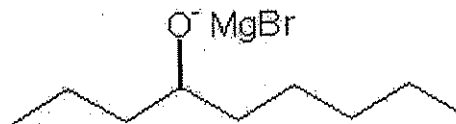


NaBr

Attacking most positive site in molecule - SN2 type reaction

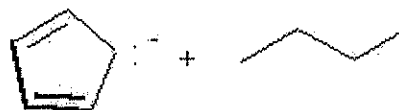


proton abstraction from the terminal alkyne followed by SN2 reaction on bromoethane



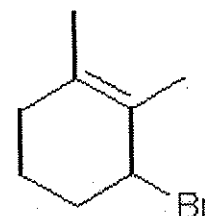
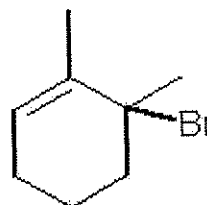
Attacking most positive site in molecule

No Reaction - weaker acid and base going to stronger acid and base - see chart



The first structure has resonance stabilization - can you draw structures?

No Reaction - weaker acid and base leading to stronger acid and base



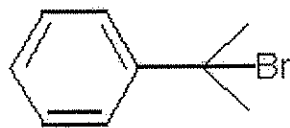
L1

Major, kinetic conditions

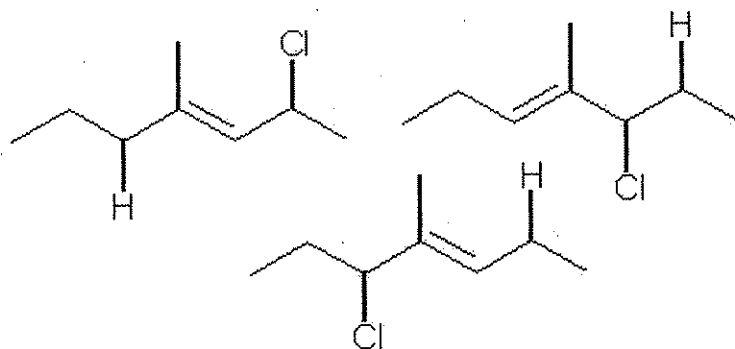
No conditions specified - so both products shown

[Back to Study Aids]

## Reaction Sheet 2 - Products

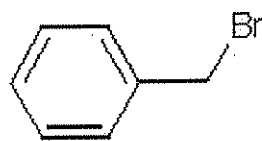


Please note that there is no substitution on the ring in spite of the fact that there is some radical character on ring..... why?

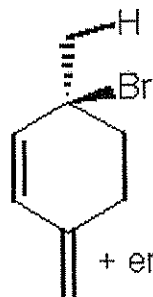
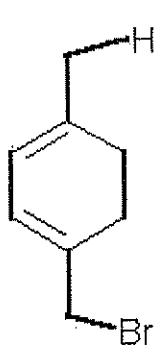


Which stereoisomers are possible here ?

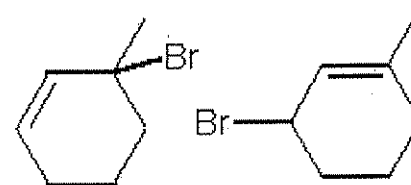
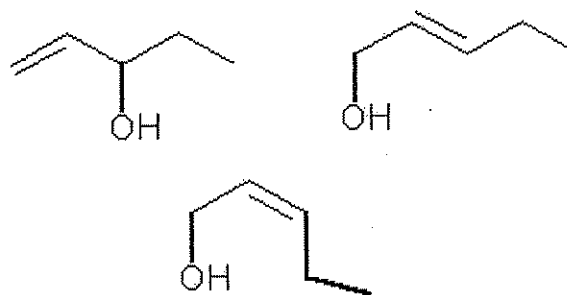
No reaction possible due to high stabilization of benzene ring - they do not undergo addition rxns



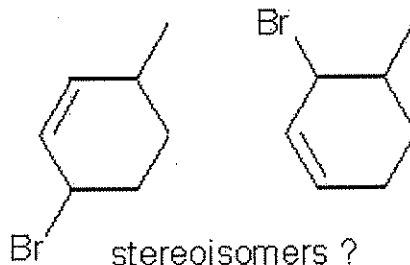
simple, but fast SN2



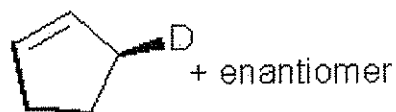
+ enantiomer



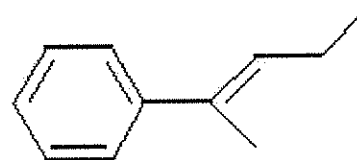
Most likely major



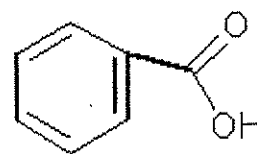
stereoisomers ?



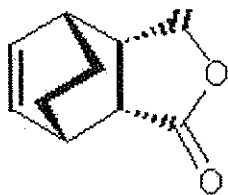
+ enantiomer



+ geometric isomer



we have not done this one yet

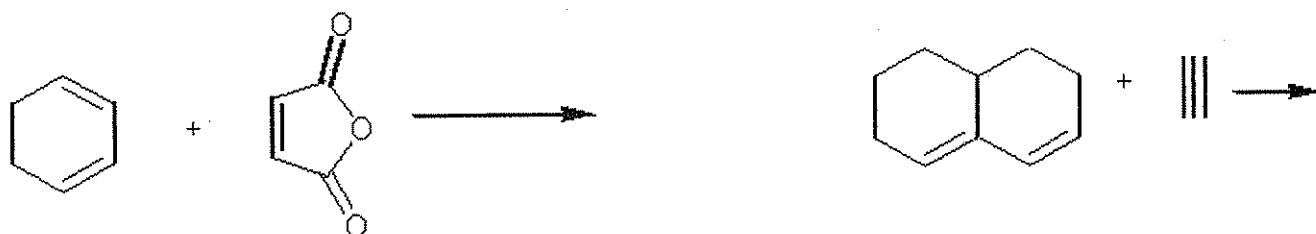
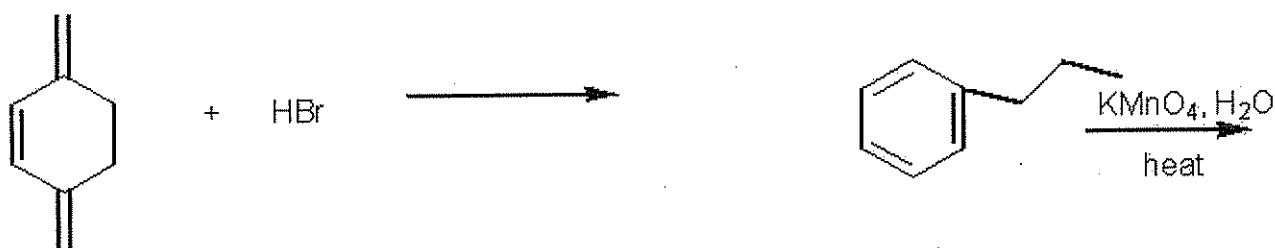
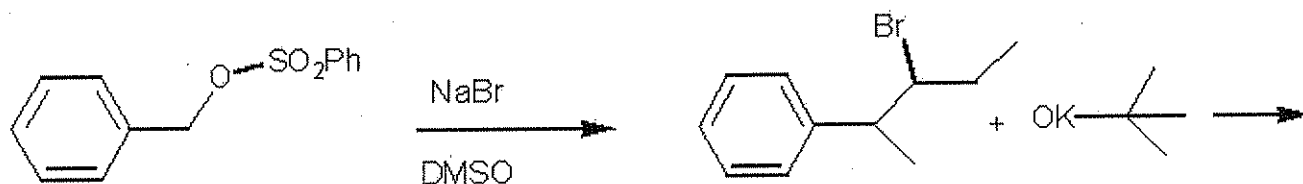
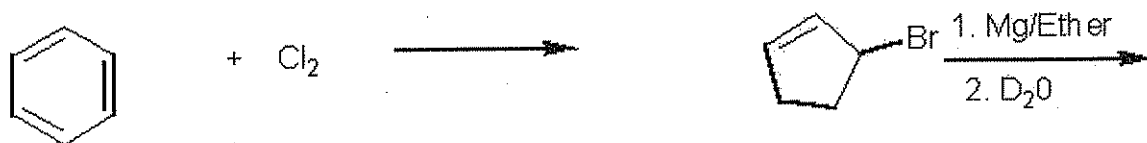
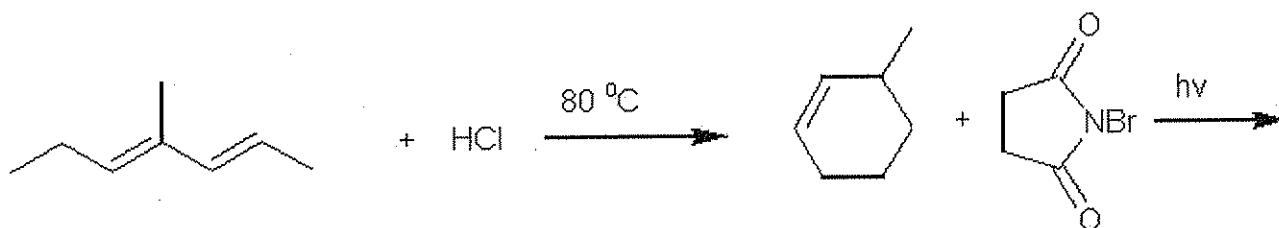


endo normally favored

no reaction

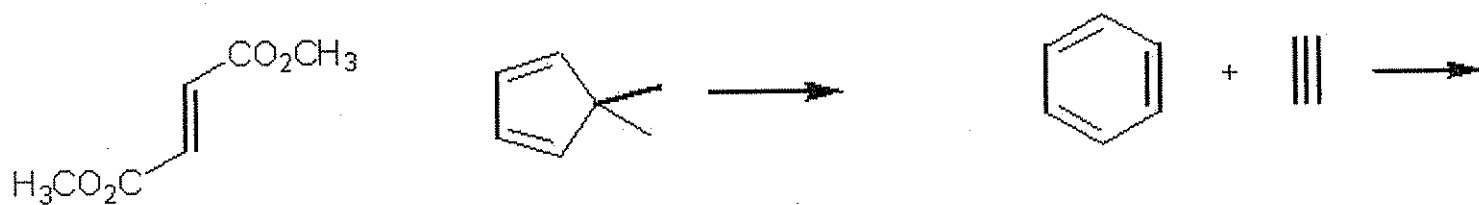
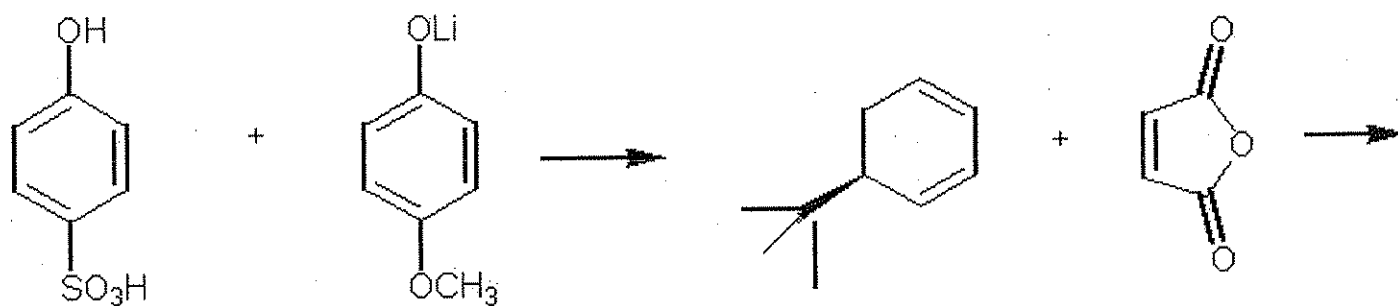
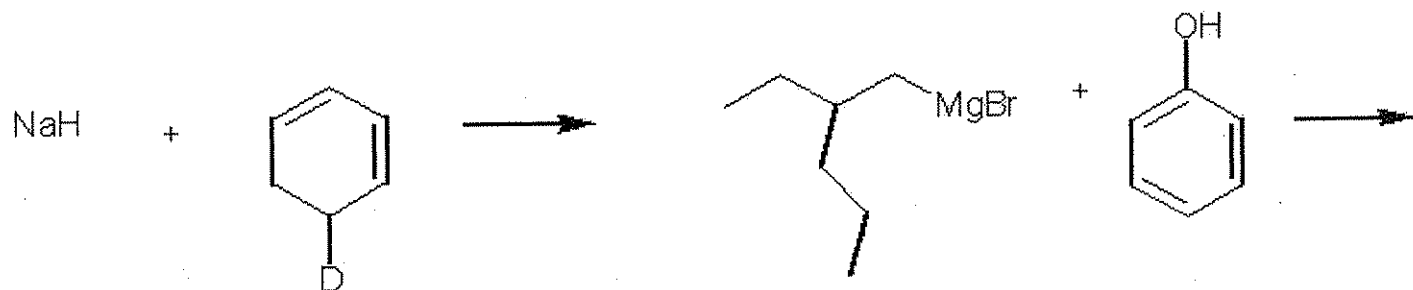
[Back to Study Aids]

## Chem 212 - Reactions no. 2 Chapter 15/ 17

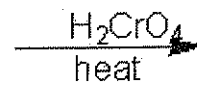
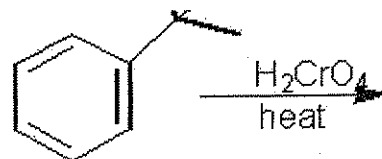
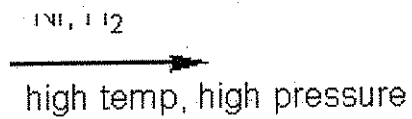
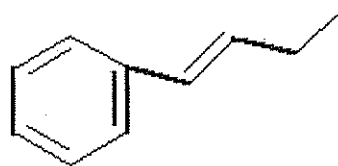


[Back to Study Aids](#)

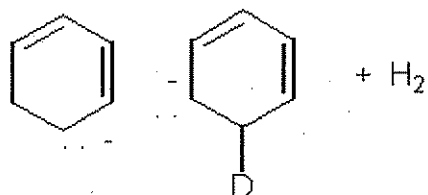
## Reaction Sheet no. 3



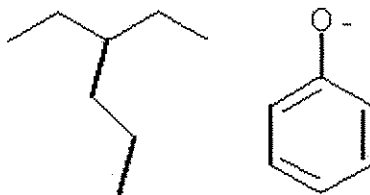
Ni L



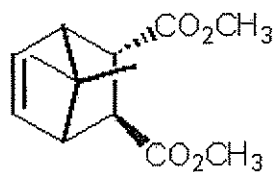
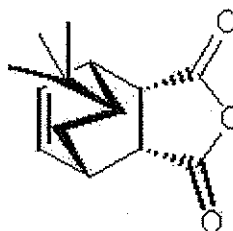
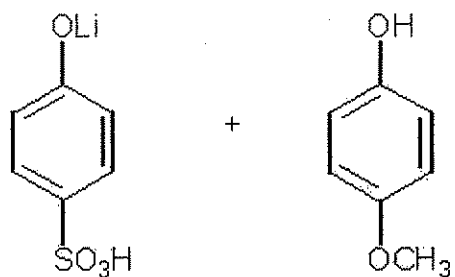
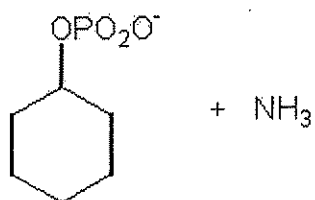
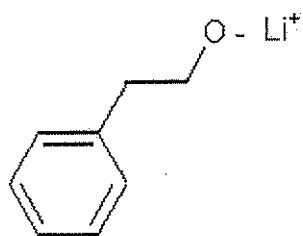
[Back to Study Aids]



resonance forms

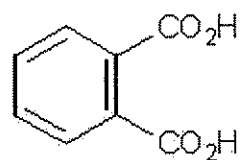


resonance forms



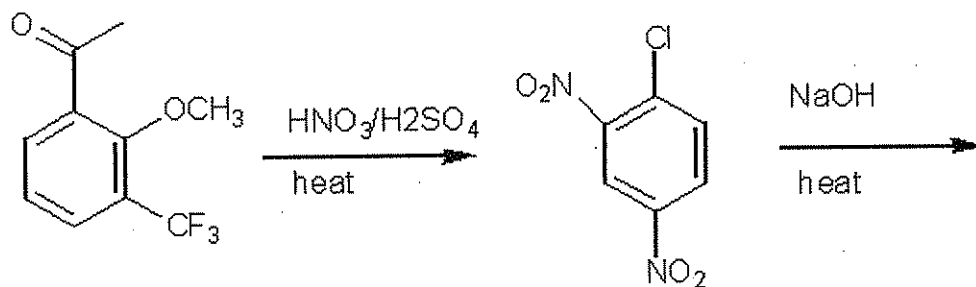
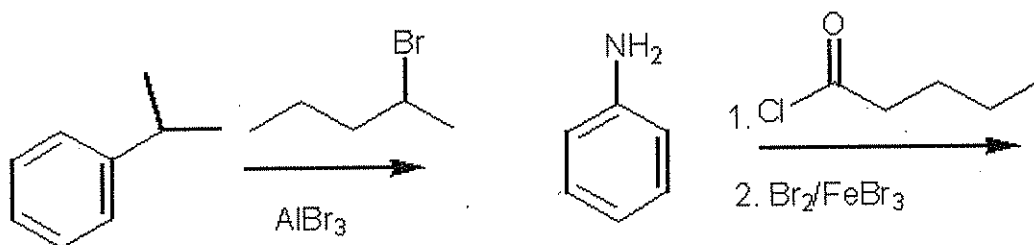
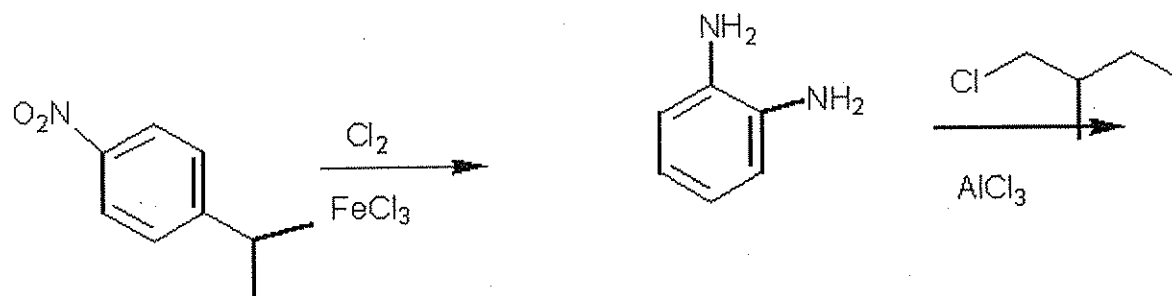
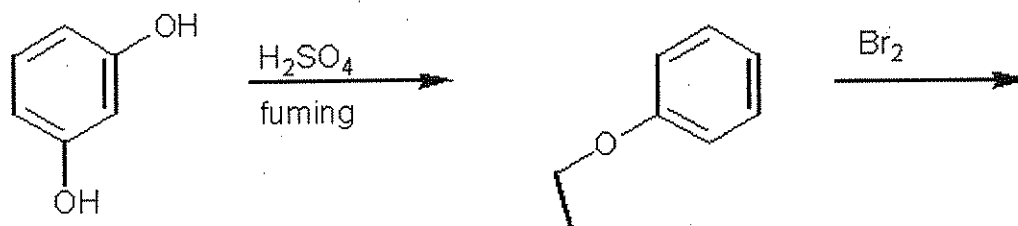
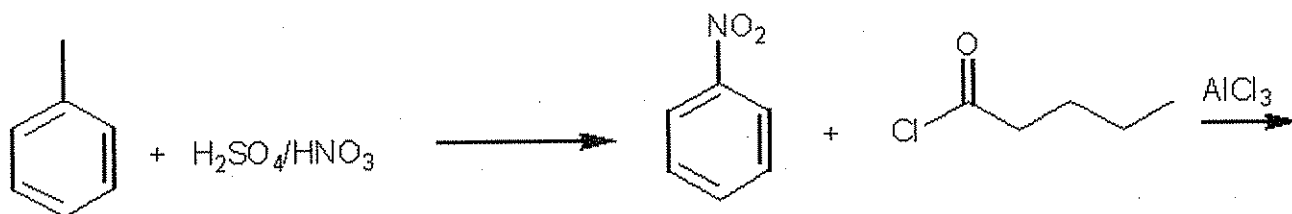
No Reaction

No Reaction

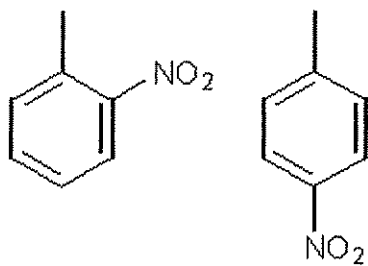


No Reaction

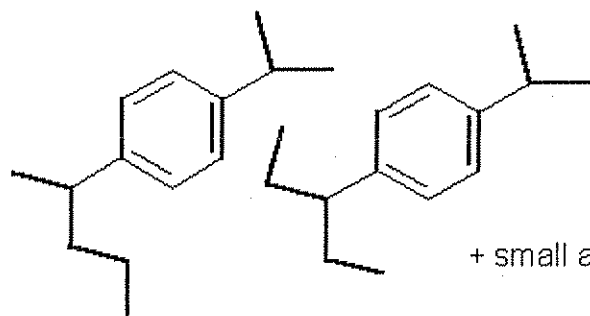
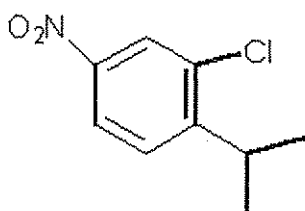
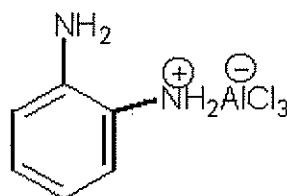
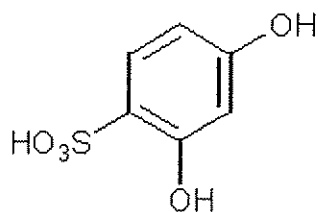
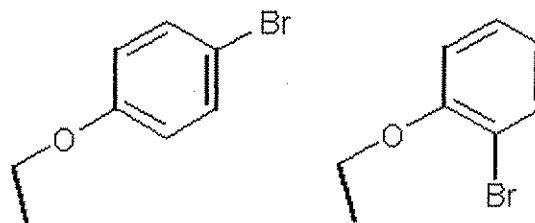
[Back to Study Aids]



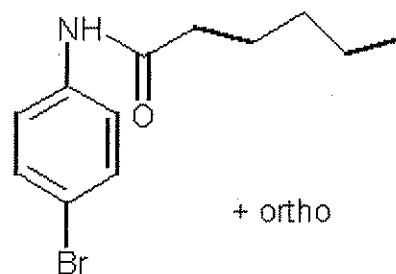
[BacktoStudyAids]



no reaction

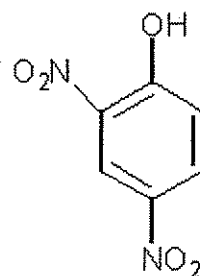
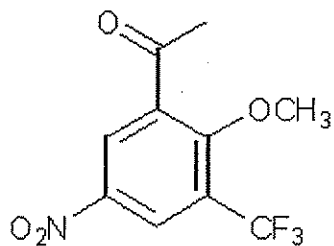


+ small amount of ortho



+ ortho

+ a small amount of ortho



Nucleophilic Aromatic Substitution

[Back to Study Aids]