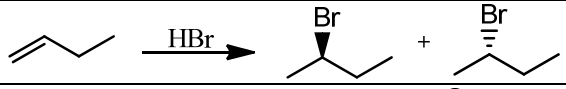
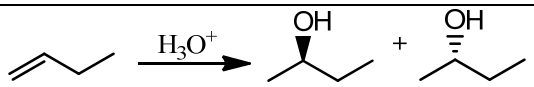
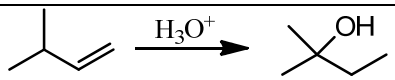
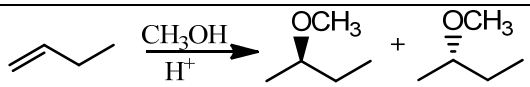
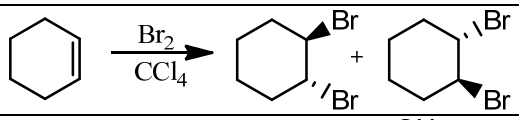
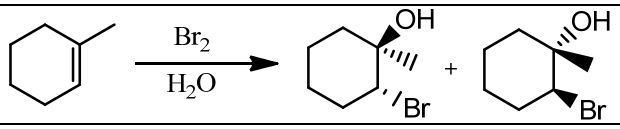
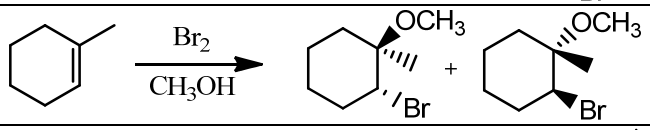
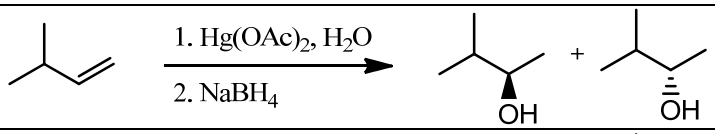
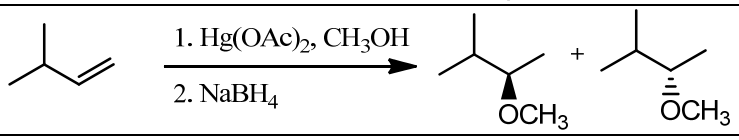
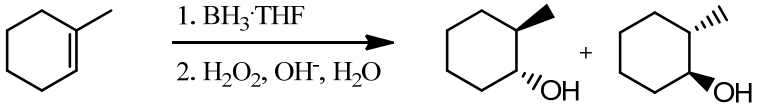
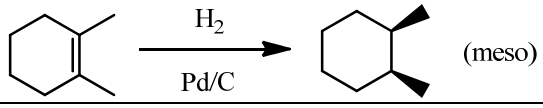
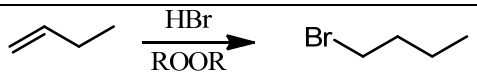
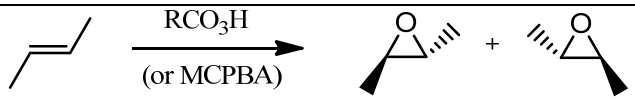
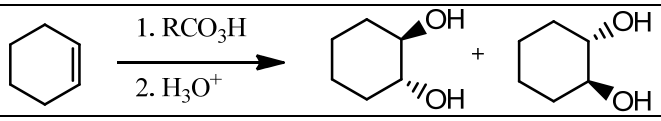
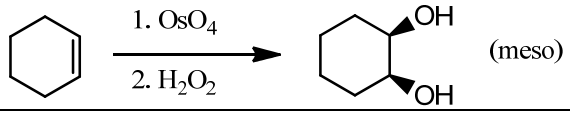
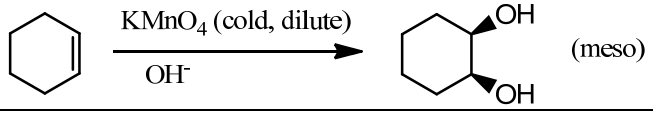
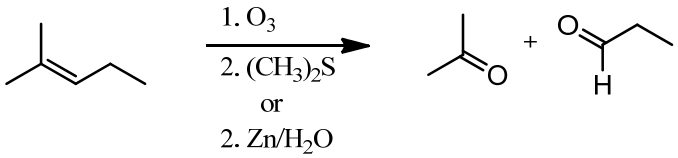
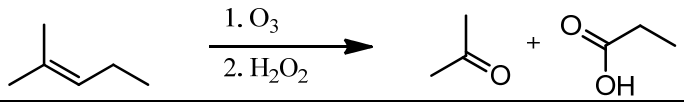
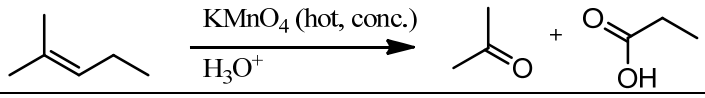
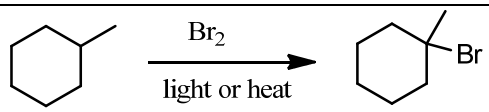
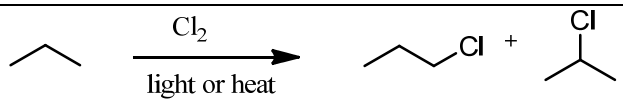
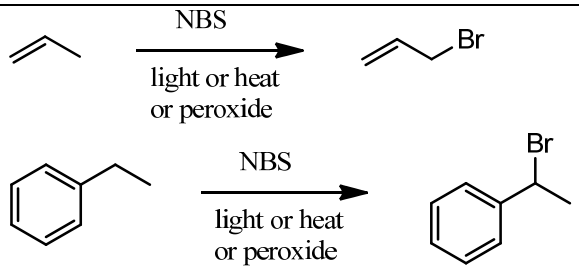
Alkene Rxns

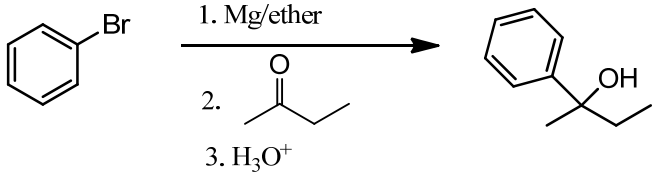
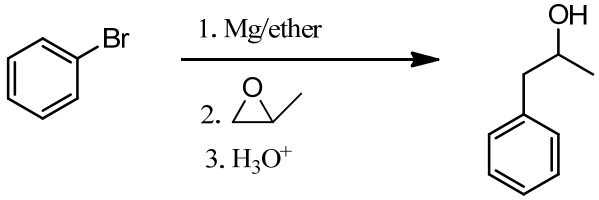
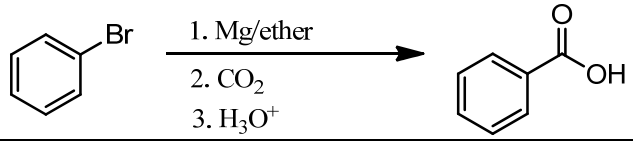
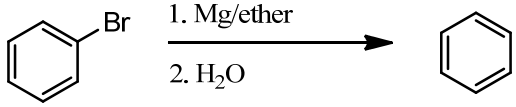
Hydrohalogenation	
Hydration	
Hydration (with rearrangement)	
Addition of Alcohol	
Bromination	
Bromination in H_2O	
Bromination in Alcohol	
Oxymercuration-Demurcuration	
Alkoxymercuration-Demurcuration	
Hydroboration-Oxidation	
Catalytic Hydrogenation (Catalytic Reduction)	
Hydrobromination with Peroxide	
Epoxidation	
Anti-Hydroxylation	
Syn-Hydroxylation	
Syn-Hydroxylation	
Ozonolysis under Reducing Conditions	

Ozonolysis under Oxidizing Conditions	
Oxidative Cleavage	

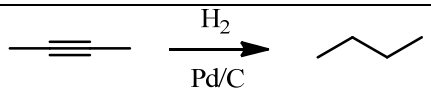
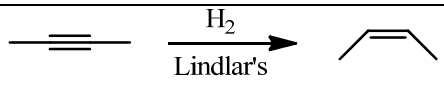
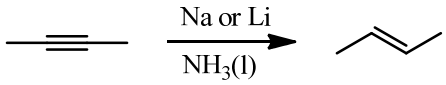
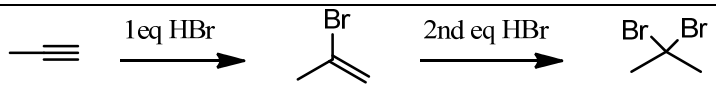
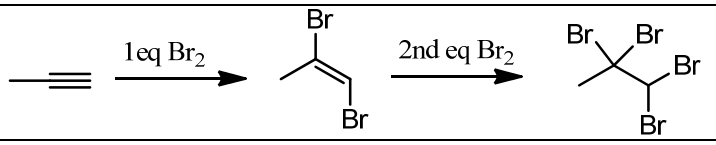
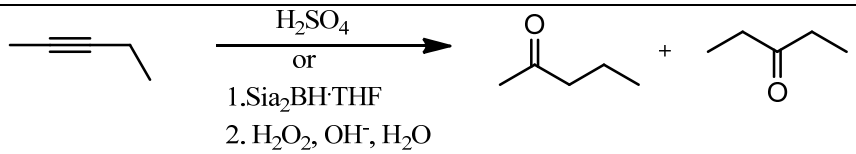
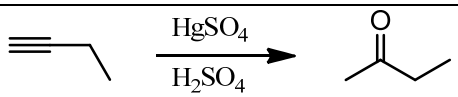
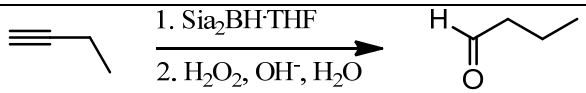
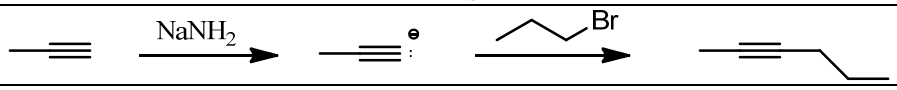
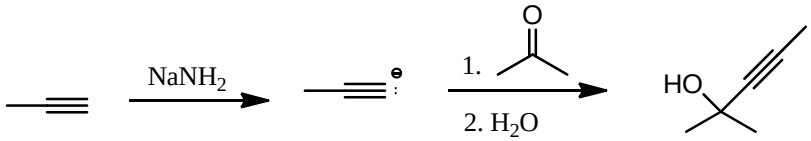
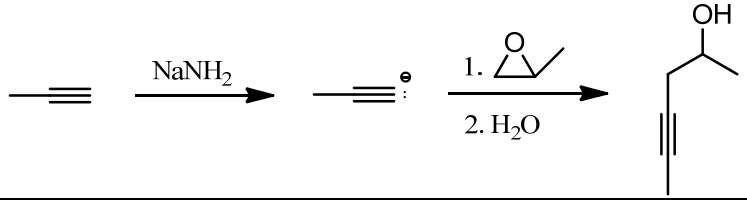
Free Radical Halogenation

Free Radical Bromination (high selectivity)	
Free Radical Chlorination (low selectivity)	
Allylic/Benzylic Bromination	

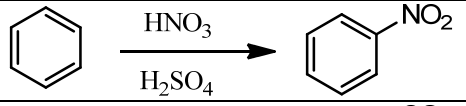
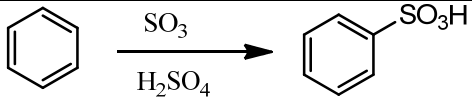
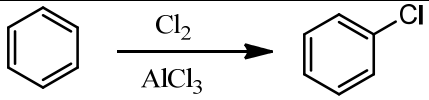
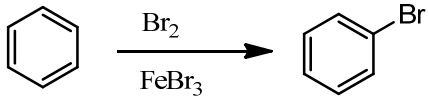
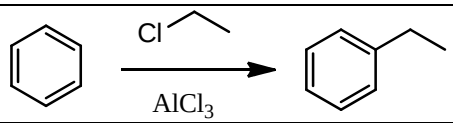
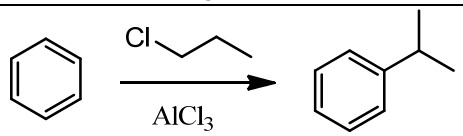
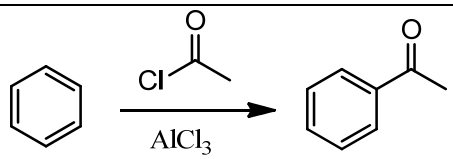
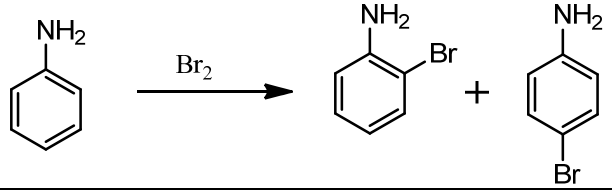
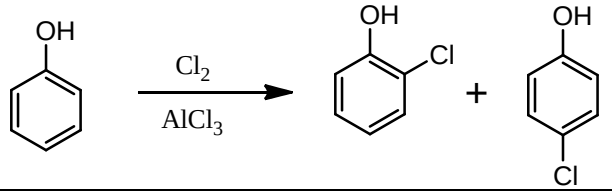
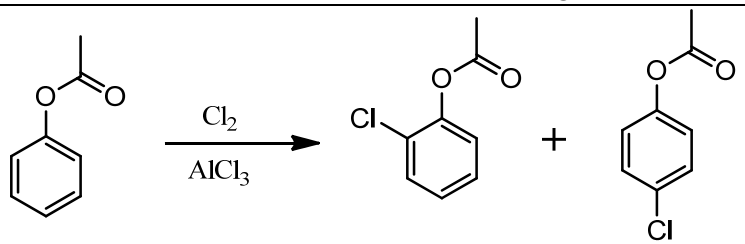
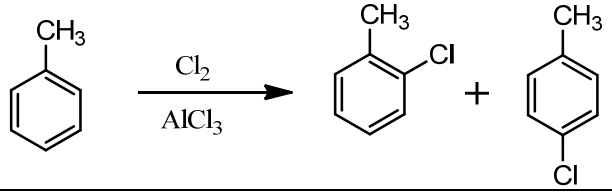
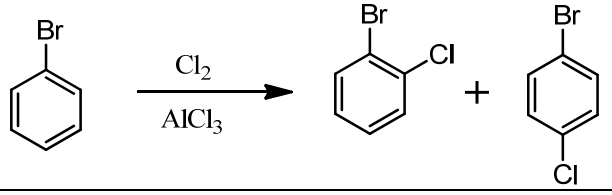
Grignard Rxns

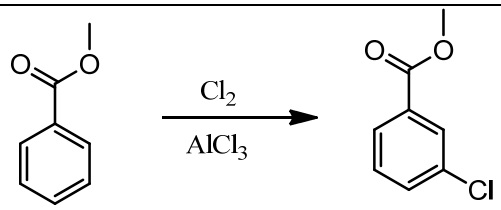
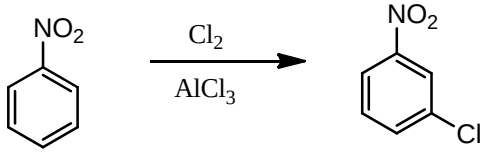
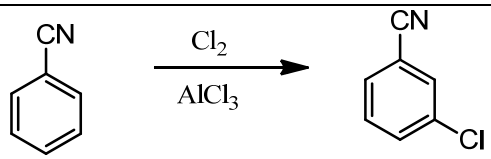
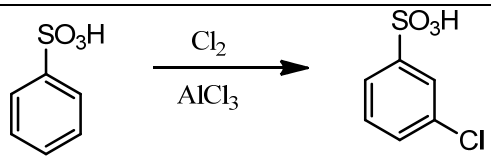
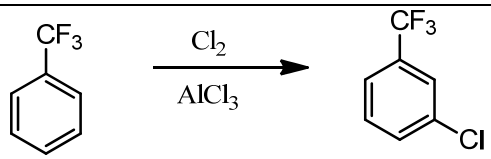
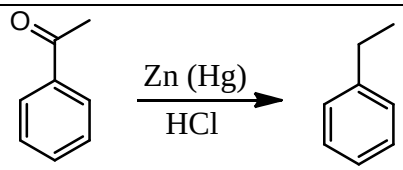
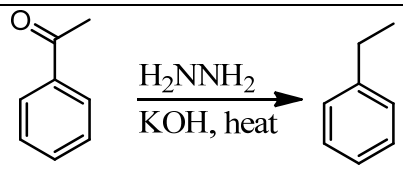
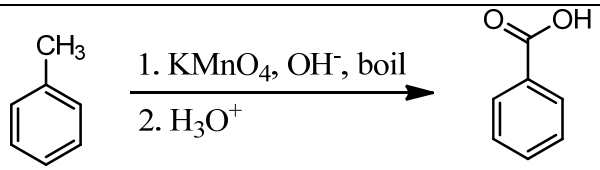
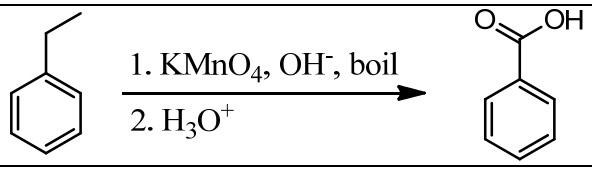
Nucleophilic Addition of a Grignard Reagent to a Ketone	
Nucleophilic Addition of a Grignard Reagent to an Epoxide (attacks less substituted side)	
Nucleophilic Addition of a Grignard Reagent to CO_2	
Protonation of a Grignard Reagent (Grignards are protonated in protic solutions)	

Alkyne Rxns

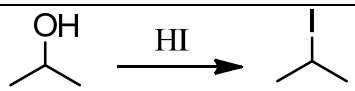
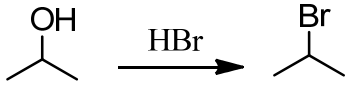
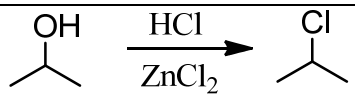
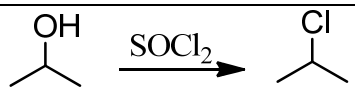
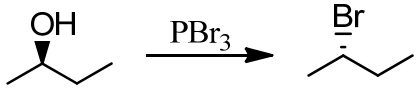
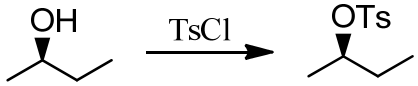
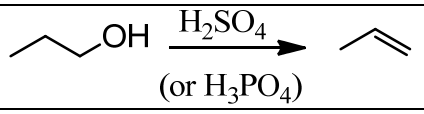
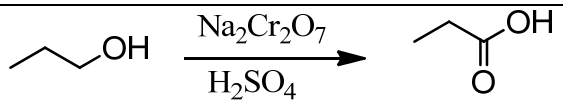
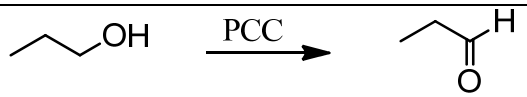
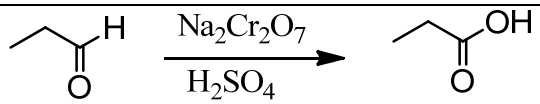
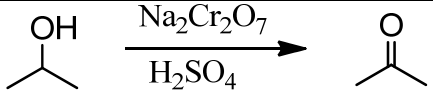
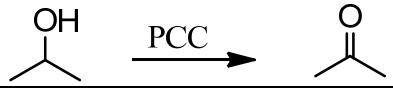
Catalytic Hydrogenation (Catalytic Reduction)	
Reduction to cis-alkene	
Reduction to trans-alkene	
Hydrohalogenation	
	
Hydration of an Internal Alkyne	
Hydration (Markovnikov)	
Hydration (Anti-Markovnikov)	
S_N2 Addition of an Acetylide Ion	
Addition of an Acetylide Ion to a Ketone	
Addition of an Acetylide Ion to an Epoxide	

Benzene Rxns

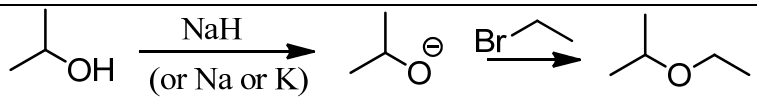
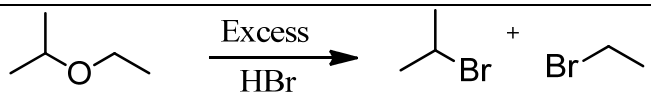
Nitration (EAS)	
Sulfonation (EAS)	
Chlorination (EAS)	
Bromination (EAS)	
Friedel-Crafts Alkylation (EAS)	
Friedel-Crafts Alkylation (EAS) (with rearrangement)	
Friedel-Crafts Acylation (EAS)	
Bromination (EAS) -NH_2 is an ortho/para director and doesn't require a catalyst like $FeBr_3$	
Chlorination (EAS) -OH is an ortho/para director	
Chlorination (EAS) -OR is an ortho/para director	
Chlorination (EAS) -CH_3 is an ortho/para director	
Chlorination (EAS) -Br is an ortho/para director	

Chlorination (EAS) Carbonyl is a meta director	
Chlorination (EAS) -NO_2 is a meta director	
Chlorination (EAS) -CN is a meta director	
Chlorination (EAS) -SO_3H is a meta director	
Chlorination (EAS) -CF_3 is a meta director	
Clemmensen Reduction	
Wolff-Kishner Reduction	
Side-chain Oxidation (Benzylic Oxidation)	
Side-chain Oxidation (Benzylic Oxidation)	

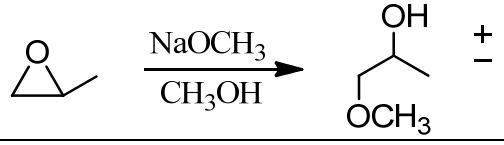
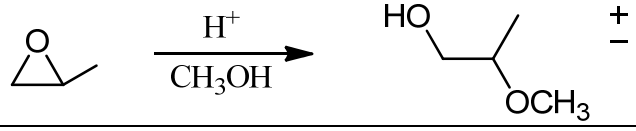
Alcohol Rxns

Conversion to an alkyl iodide	
Conversion to an alkyl bromide	
Conversion to an alkyl chloride	
Conversion to an alkyl chloride with thionyl chloride (only for 1° and 2°)	
Conversion to an alkyl bromide (only for 1° and 2°)	
Conversion to a tosylate ester	
Acid-catalyzed Dehydration	
Chromic Acid Oxidation of a 1° Alcohol (Chromic Acid can also be written as H_2CrO_4 or CrO_3/H_2SO_4)	
PCC Oxidation of a 1° Alcohol	
Chromic Acid Oxidation of an Aldehyde	
Chromic Acid Oxidation of a 2° Alcohol	
PCC Oxidation of a 2° Alcohol	

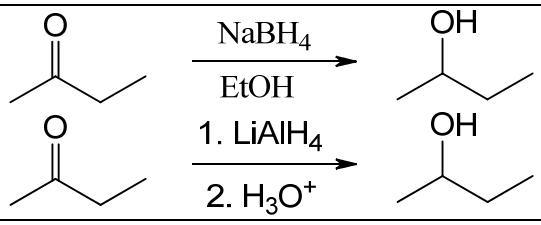
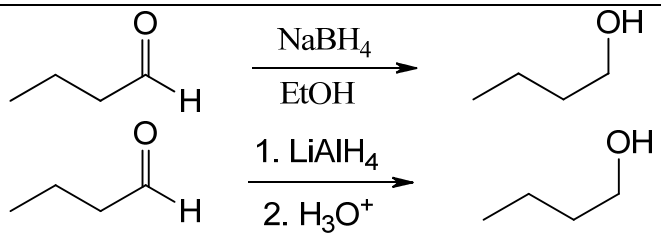
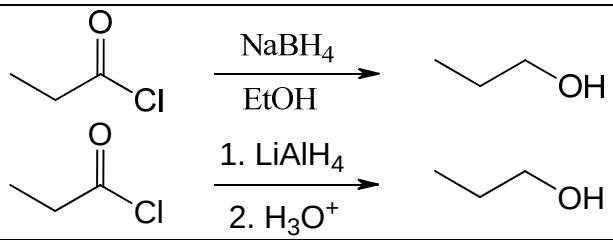
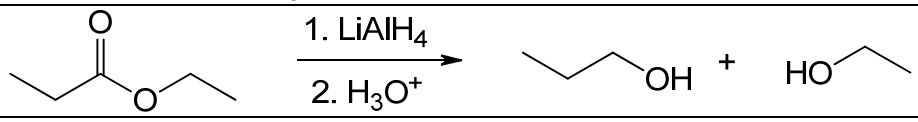
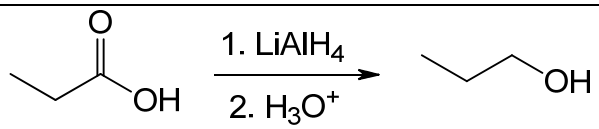
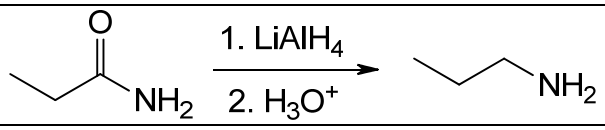
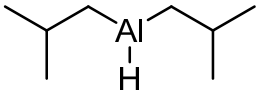
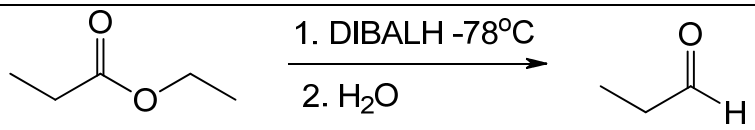
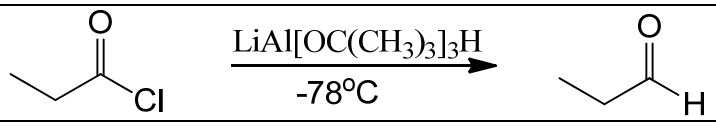
Ether Rxns

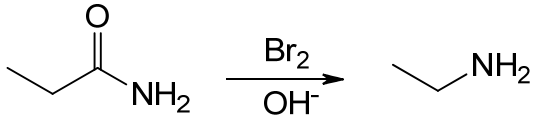
Williamson Ether Synthesis (2^{nd} step is S_N2)	
Acid-Catalyzed cleavage of Ethers (also works with HI and HCl)	

Epoxide Rxns

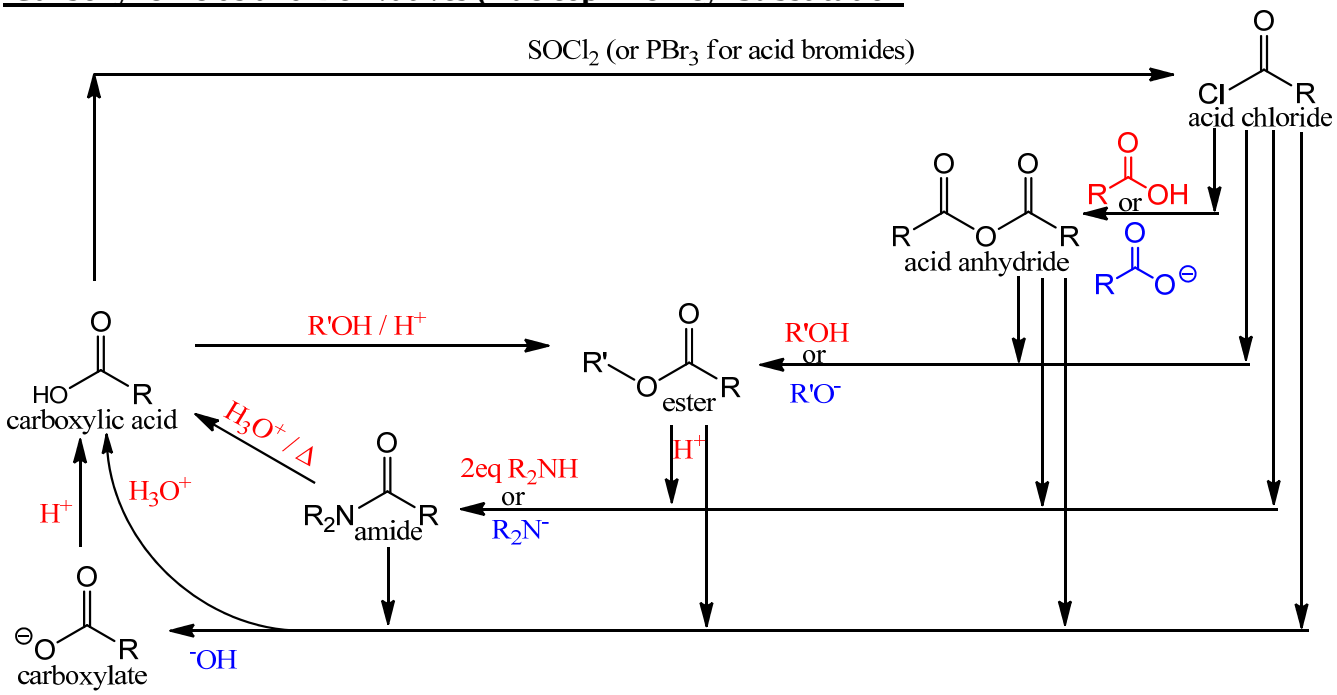
Base-Catalyzed Ring Opening of an Epoxide (Attacks less-substituted side)	
Acid-Catalyzed Ring Opening of an Epoxide (Attacks more-substituted side)	

Hydride Reduction Rxns

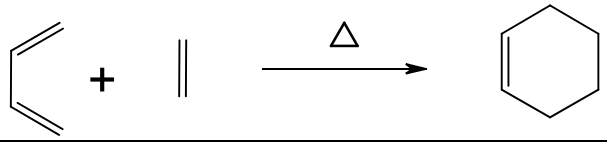
Reduction of a ketone to a 2° alcohol	
Reduction of a aldehyde to a 1° alcohol	
Reduction of an acid chloride to a 1° alcohol	
Reduction of an ester to two alcohols	
Reduction of a carboxylic acid to a 1° alcohol	
Reduction of an amide to an amine	
Reduction of an ester to an aldehyde using DIBALH (also called DIBAH) DIBALH is diisobutylaluminum hydride (shown below) 	
Reduction of an acid chloride to an aldehyde using tri-*t*-butoxyaluminum hydride	

Hoffman Rearrangment Converts an amide to an amine with the loss of a carbon (note the difference with reduction of an amide with $LiAlH_4$ where there is no loss of carbon)	

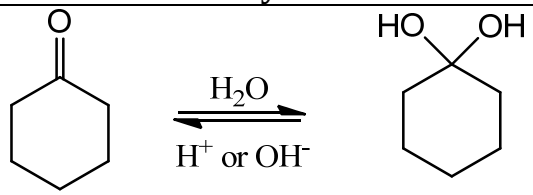
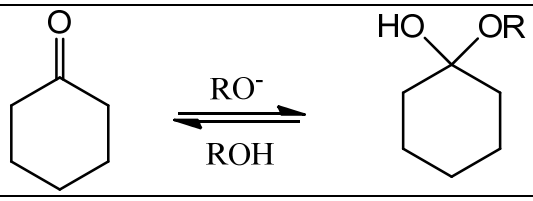
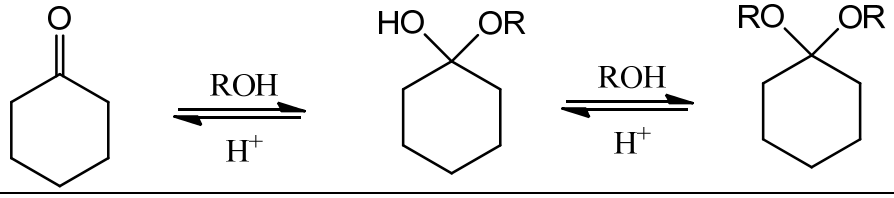
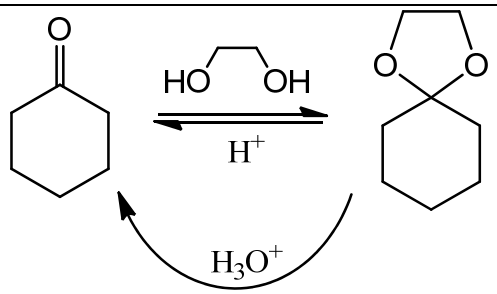
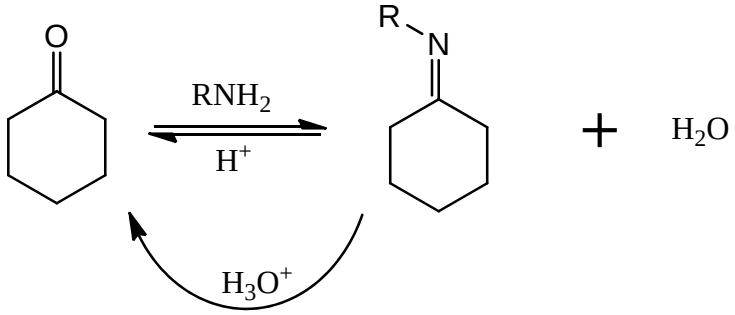
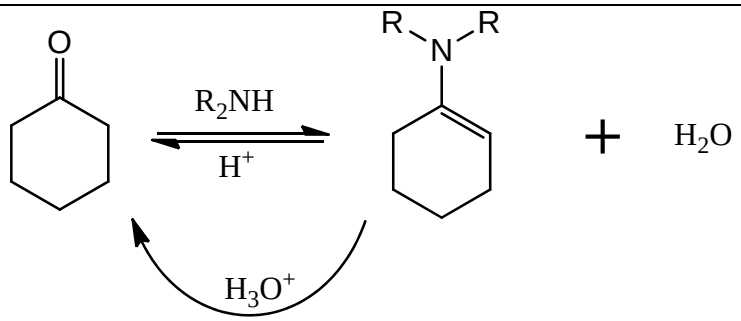
Carboxylic Acids and Derivatives (Nucleophilic Acyl Substitution

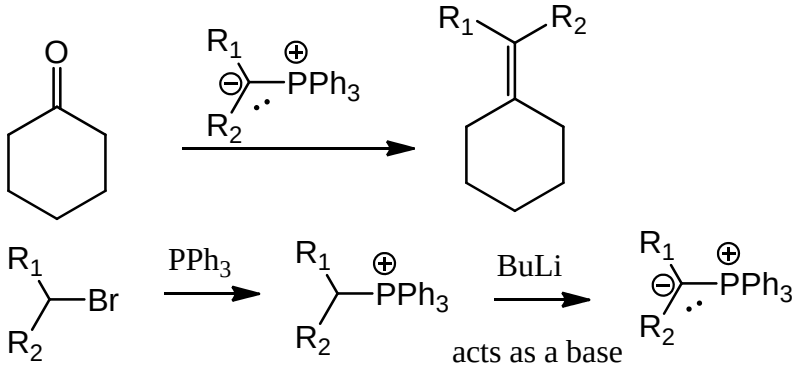
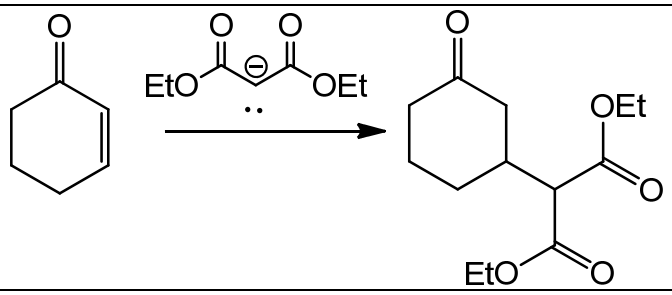
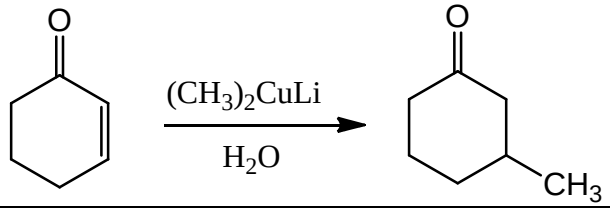


Diels-Alder Rxns

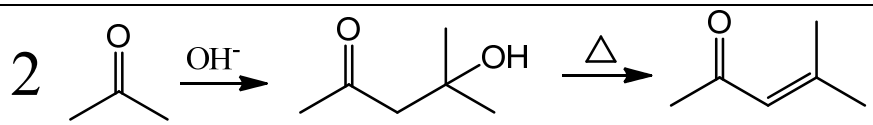
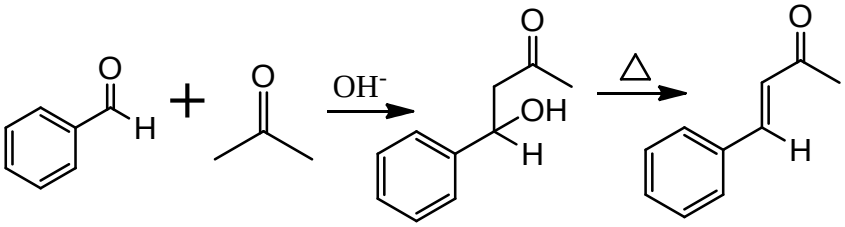
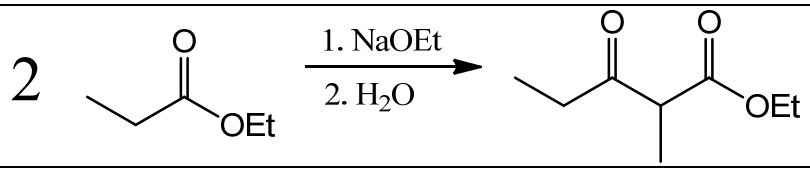
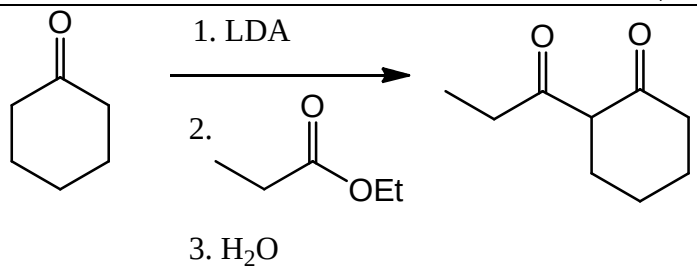
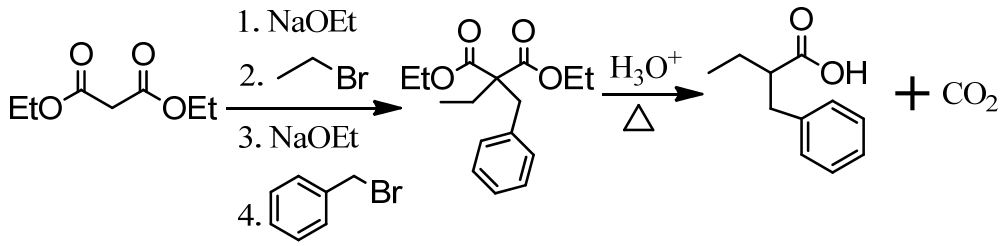
Basic Diels-Alder Rxn (a 4+2 cycloaddition rxn)	

Nucleophilic Addition to Ketones and Aldehydes

Addition of water to form a hydrate	
Addition of an alcohol under basic conditions to form a hemi-ketal	
Addition of 1eq of an alcohol in acid to form a hemi-ketal and then a 2nd eq to form a ketal	
Addition of ethylene glycol to from a cyclic ketal which functions as a protecting group for ketones and aldehydes H_3O^+ is used to de-protect	
Addition of a 1° amine to form an imine (can be reversed with H_3O^+)	
Addition of a 2° amine to form an enamine Forms on less substituted side if there's a difference (can be reversed with H_3O^+)	

Wittig Rxn Addition of a phosphylide to form an alkene Formation of a phosphoylide from an alkyl halide	
Michael Addition (also called β-addition or conjugate addition)	
Michael Addition with a lithium dialkylcuprate	

Alpha Addition Rxns

Self Aldol Condensation	
Mixed Aldol Condensation	
Self Claisen Condensation	
Mixed Claisen Condensation	
Malonic Ester Synthesis	
Acetoacetic Ester Synthesis