

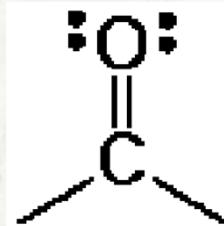
Ketones

Content

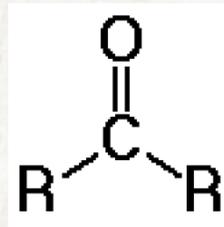
- Ketones
- Nomenclature
- Preparation of Ketons
- Nucleophilic Addition Reaction of Aldehydes and Ketones
- Conjugate Additions to α , β -Unsaturated Aldehyde & Ketons
- Summary

Ketones

- Carbonyl Functional Groups



- Aldehydes and Ketones
- Both R groups are C or H

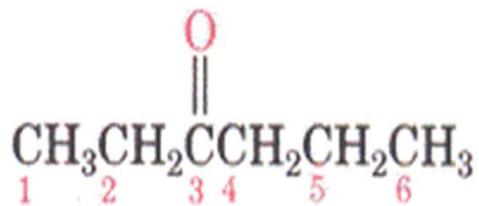


Nomenclature

- Ketones are named by replacing the terminal -e of the parent alkane with the suffix -one.
- Parent chain
 - Contain the carbonyl group
- Number the carbon chain, beginning at the end nearest to the carbonyl group

Nomenclature

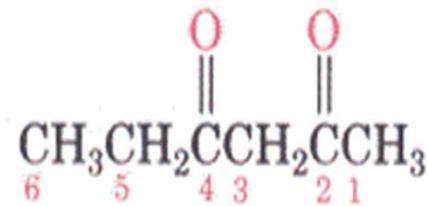
- Number the substituents and write the name, listing substituents alphabetically.



3-Hexanone



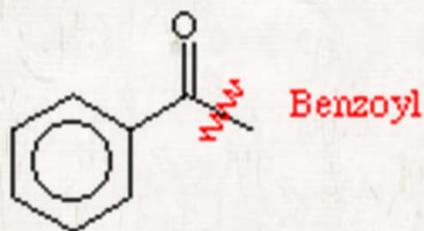
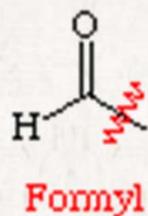
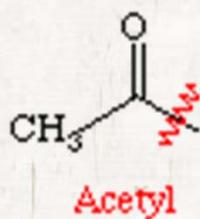
4-Hexen-2-one



2,4-Hexanedione

Nomenclature

- When the $-COR$ group becomes a substituent on another chain, it is referred to as an acyl group and the name is formed using the suffix $-yl$.



Nomenclature

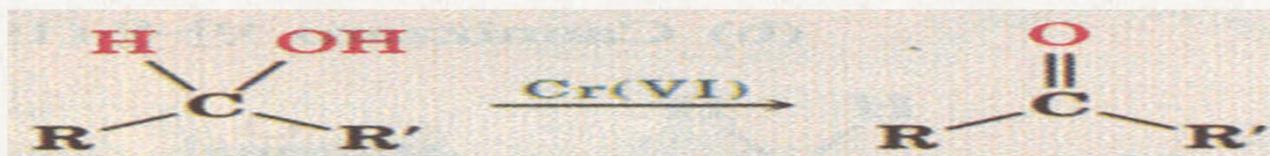
- When the carbonyl group becomes a substituent on another chain, it is referred to as an oxo group.



5-oxohexanal

Preparation of Ketons

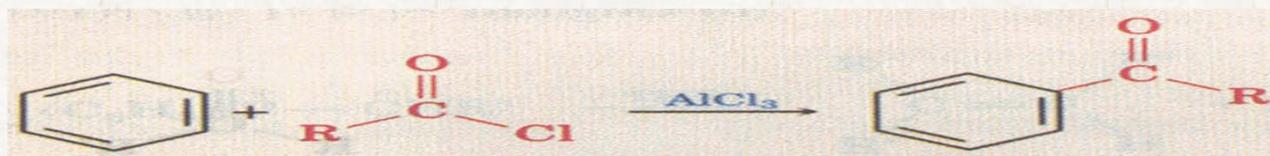
- Oxidation of Secondary Alcohols



- Ozonolysis of Alkenes

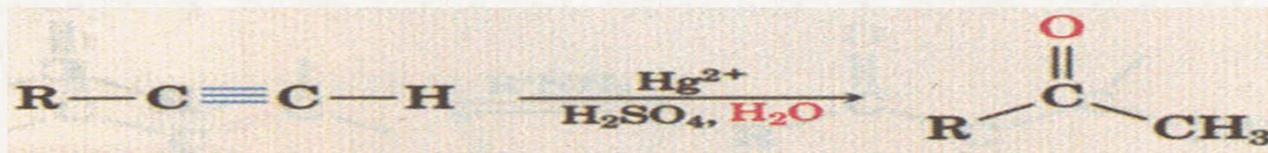


- Friedel-Crafts Acylation

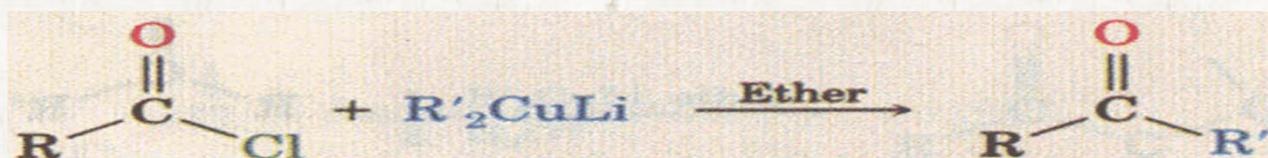


Preparation of Ketons

- Alkyne Hydration

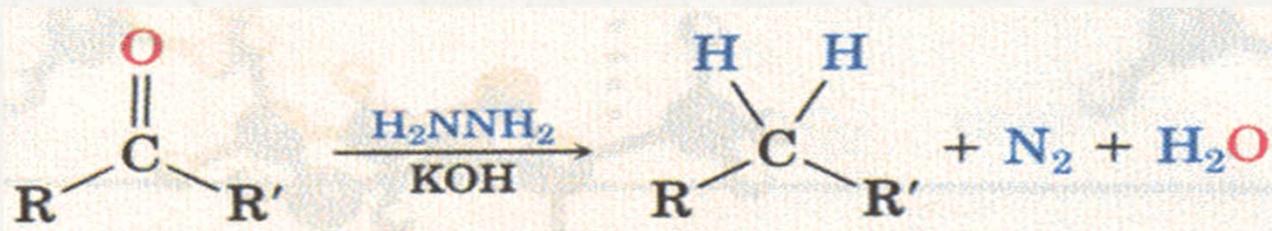


- Diorganocopper Reaction with Acid Chlorides



Hydrazine Addition

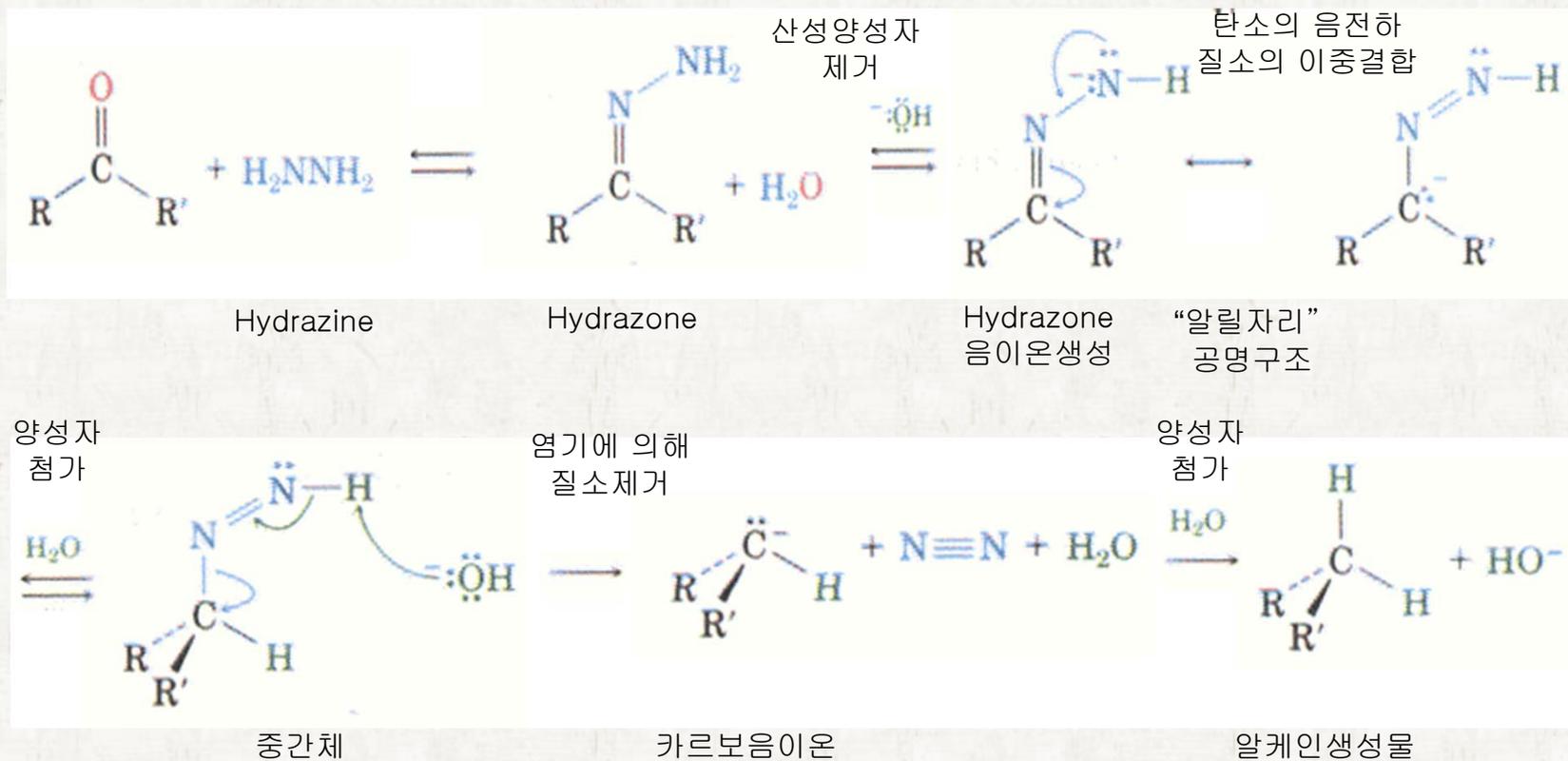
● Wolff–kishner Reaction



- 케톤 혹은 알데하이드를 알케인으로 전환시키는 매우 중요한 합성법
- Wolff-Kishner환원은 아실벤젠을 알킬벤젠으로 바꾸는 촉매 수소화 반응과 전체 변화과정이 동일하게 이루어짐

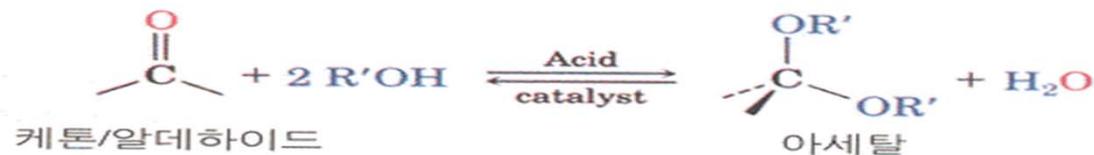
Hydrazine Addition

- 케톤 혹은 알데하이드에서 알케인이 얻어지는 Wolff-Kishner 환원반응 메카니즘

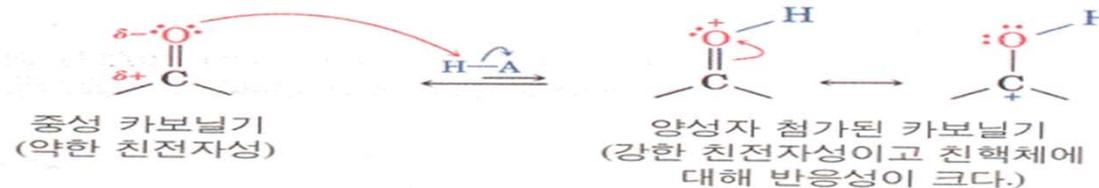


Addition of Alcohols

Acetals

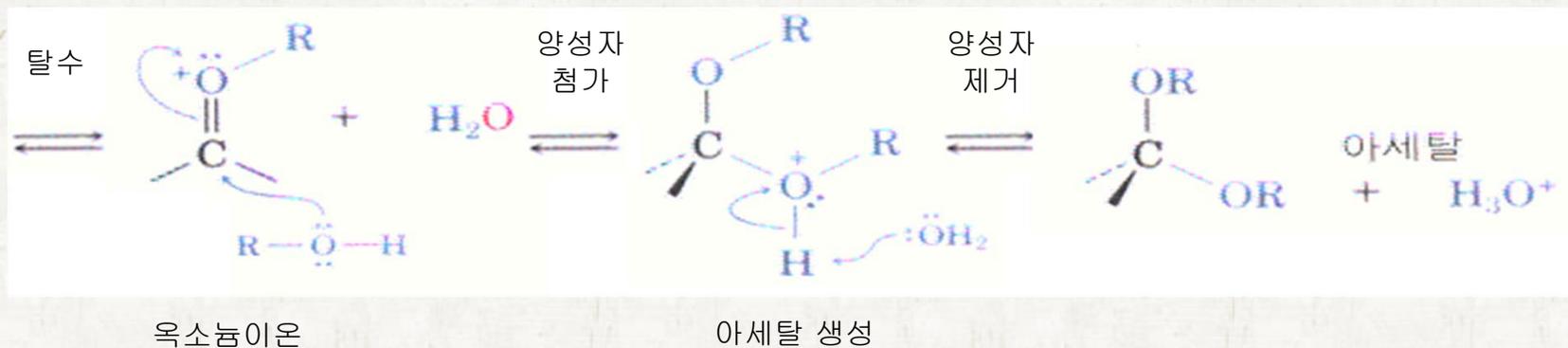
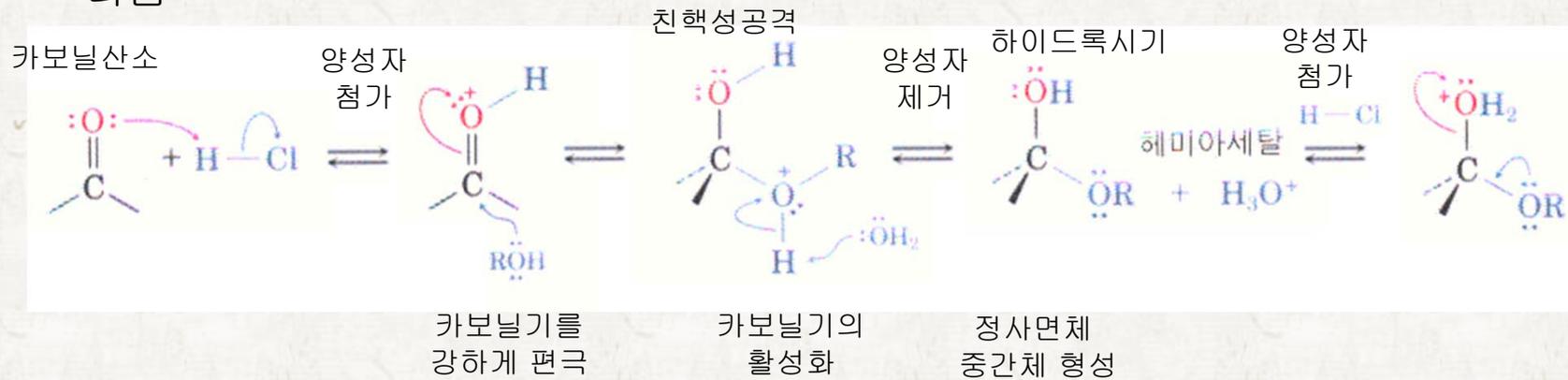


- 케톤과 알데하이드는 산촉매 존재하에 알코올과 가역적으로 반응하여 아세탈 [(acetal), $\text{R}_2\text{C}(\text{OR}')$]을 형성
- 산성조건에서는 양성자 첨가에 의해 카보닐기의 반응성은 커지고 따라서 알코올의 첨가는 빠르게 일어난다.



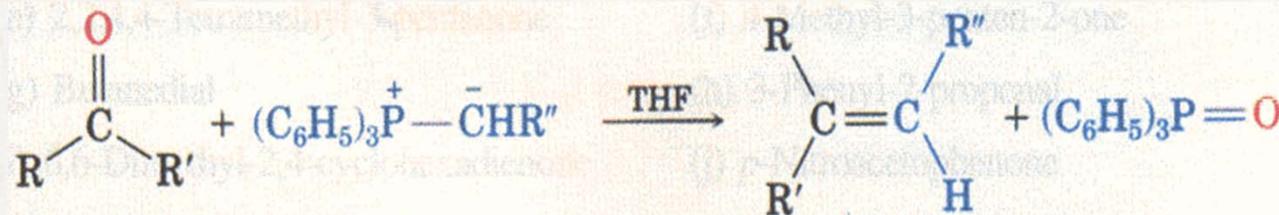
Addition of Alcohols

- 케톤 혹은 알데하이드와 알코올과의 반응에 의한 산-촉매 아세탈 형성반응 메카니즘



Addition of Phosphorus Ylides

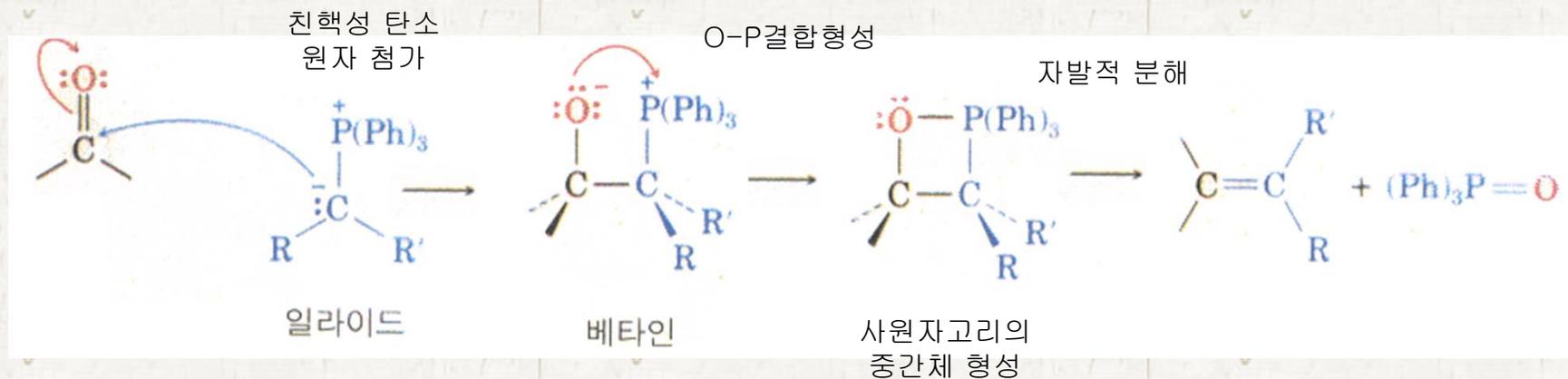
Wittig Reaction



- 케톤과 알데하이드가 알켄으로 전환되는 반응
- 인 일라이드(ylide)를 케톤 혹은 알데하이드에 첨가시켜 베타인(betaine)형성
- 이 반응은 이미 알려진 구조의 알켄을 만들수 있다는점

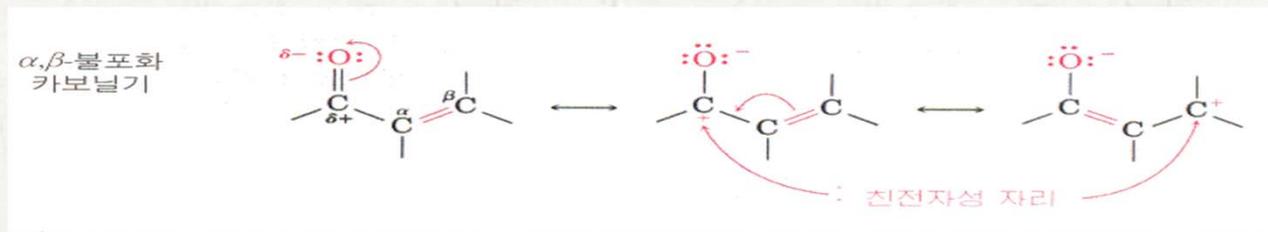
Addition of Phosphorus Ylides

- 케톤 혹은 알데하이드와 인 일라이드 사이에 알켄을 생성하는 Wittig 반응 메카니즘



α, β -Unsaturated Aldehyde & Ketons

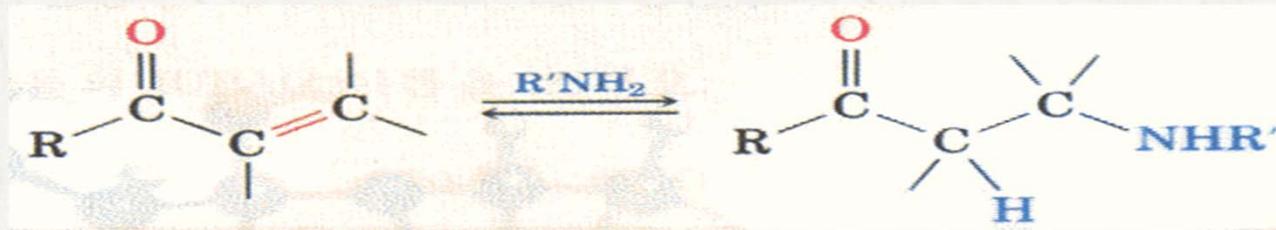
- α 탄소
 - 카보닐기 바로 다음에 위치한 탄소 원자
- β 탄소
 - α 탄소 다음에 위치한 탄소 원자



- α, β -불포화 카보닐 화합물의 β 탄소는 친전자성자리이고, 친핵체와 반응할 수 있다.

Conjugate Additions

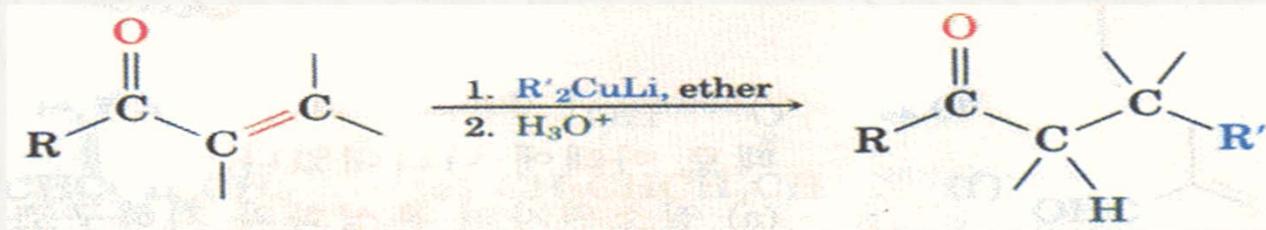
● Addition of Amines



- 일차 및 이차 아민은 α,β -불포화 카보닐 화합물에 첨가되어 β -아미노 케톤과 알데하이드를 형성한다.
- 온화한 조건에서 빠르게 일어나고 수득률이 높다.

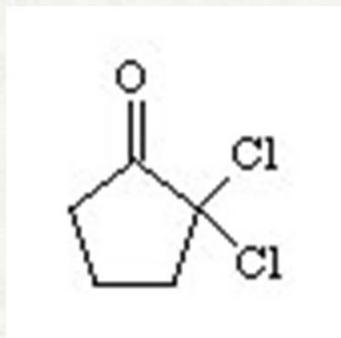
Conjugate Additions

● Addition of Alkyl and Alkyl Groups

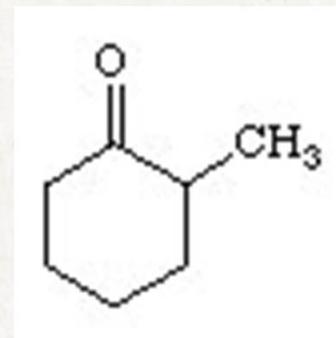


- α,β -불포화 케톤에 알킬기의 콘쥬게이션 첨가는 가장 유용한 1,4-첨가 반응 중에 하나이다.
- 알킬기의 콘쥬게이션 첨가는 α,β -불포화 케톤을 lithium diorganocopper 시약의 처리에 의해 이루어진다.

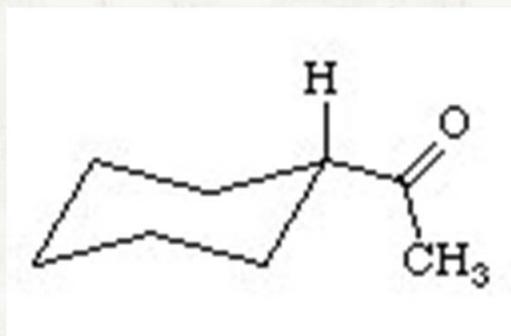
Summary



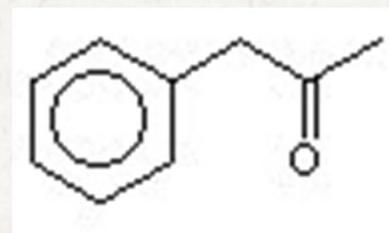
2,2-dichlorocyclopentanone



2-methylcyclohexanone



cyclohexylethanone



1-phenyl-2-propanone

Summary

