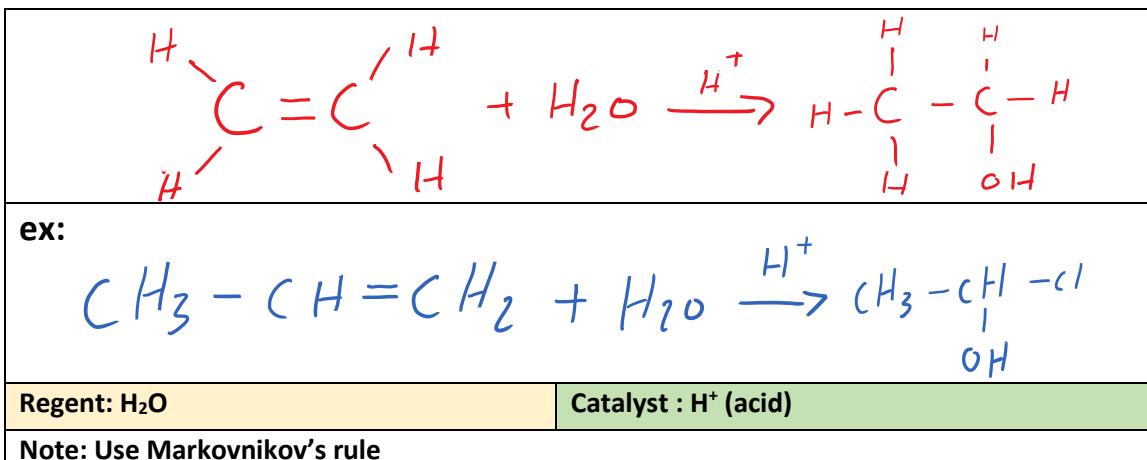


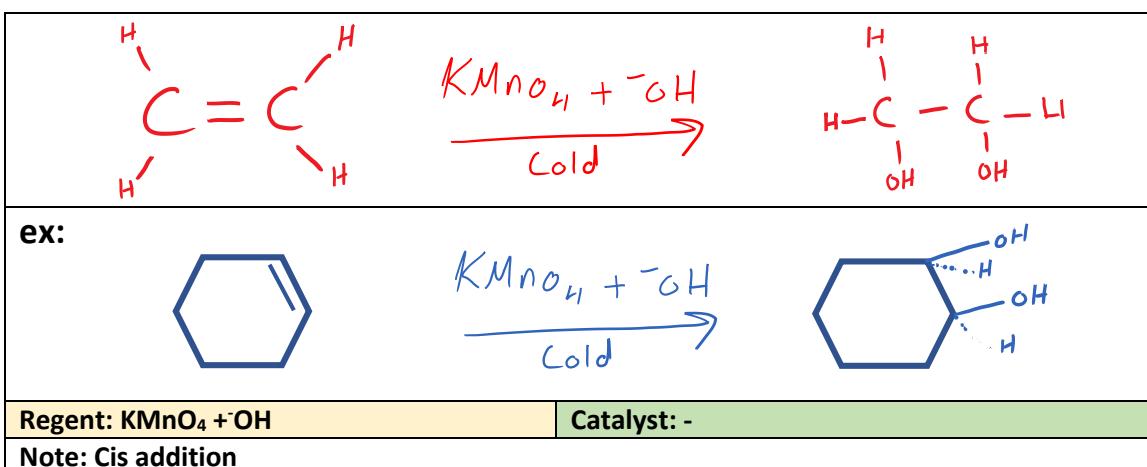
SUMMARY OF REACTIONS CHAPTER 4

Preparation of alcohol

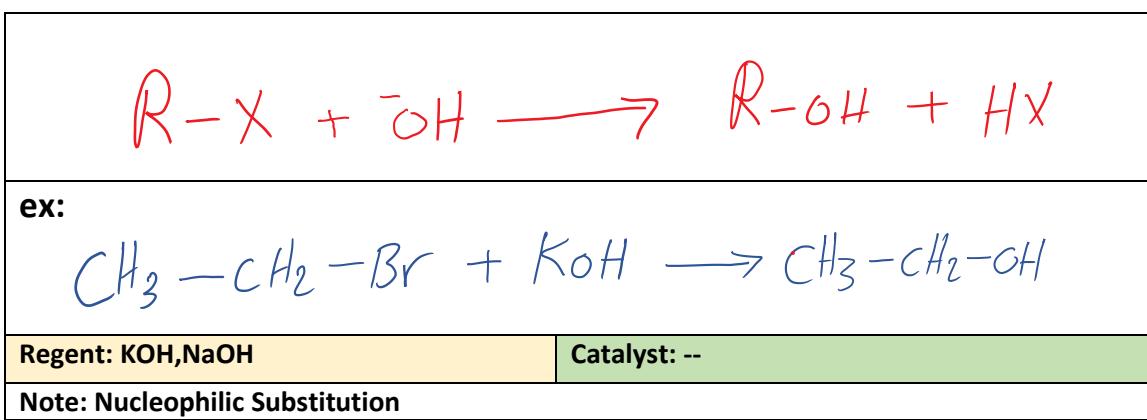
1. Form alkene (Hydrolysis):



2. From alkene (Oxidation):

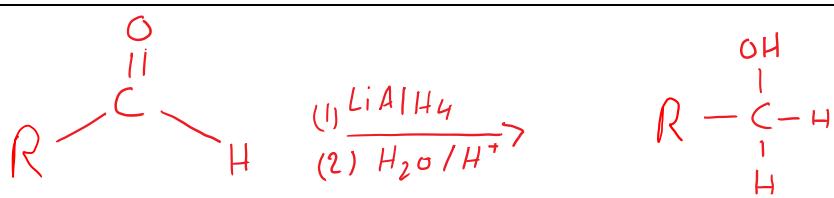


3. From Alkyl Halide (Nucleophilic Substitution):

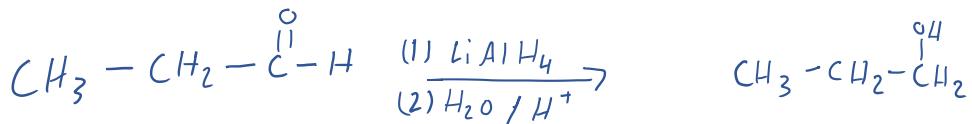


4. Reduction of Ketones and Aldehydes

aldehydes:



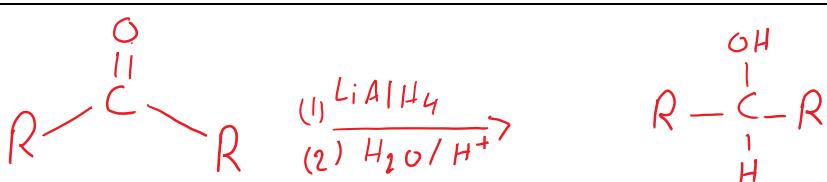
ex:



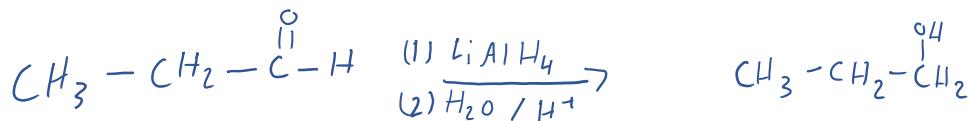
Regent: 1) LiAlH₄ 2) H₂O\H⁺ Or 1) NaBH₄ 2) H₂O\H⁺ Catalyst: --

Note: Reduction of aldehydes gives primary alcohol (1°)

ketones:



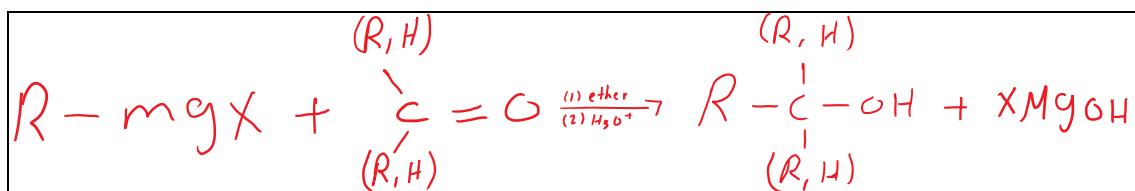
ex:



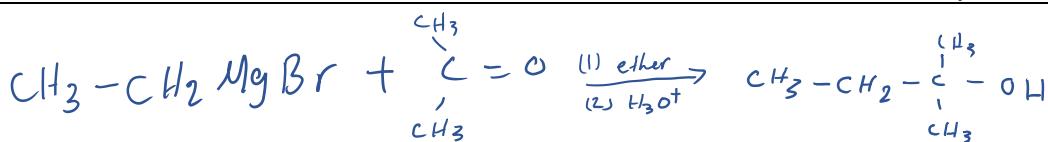
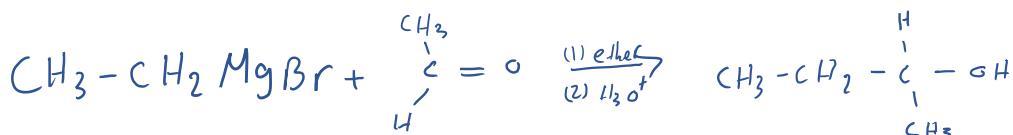
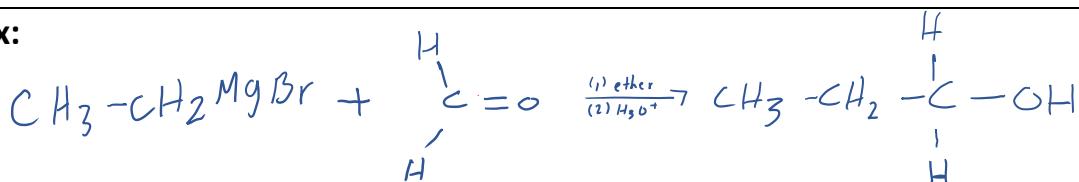
Regent: 1) LiAlH₄ 2) H₂O\H⁺ Or 1) NaBH₄ 2) H₂O\H⁺ Catalyst: --

Note: Reduction of ketones gives secondary alcohol (2°)

5. Addition of Grignard's Reagent to Aldehydes and Ketones



ex:



Regent: 1) formaldehyde ,aldehydes ,ketones 2) H₃O⁺ Catalyst: ether solvent

Note: formaldehyde gives 1° alcohol ,aldehydes gives 2° alcohol, ketones gives 3° alcohol

Reaction of alcohol

1. Reactions of Alcohols with Hydrogen Halides



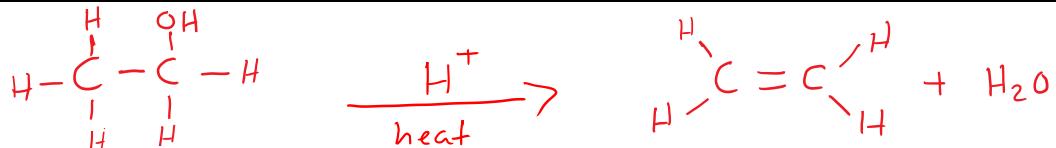
ex:



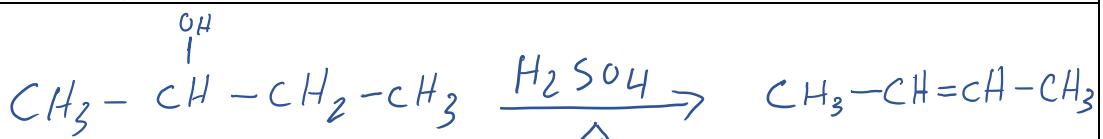
Regent: HBr, HCl, HI

Catalyst: -

2. Dehydration of Alcohols to form Alkenes



ex:



Regent: -

Catalyst: H^+ (acid) + heat

Note: use Saytzeff's rule

3. Oxidation Reaction of Primary alcohol (1°)

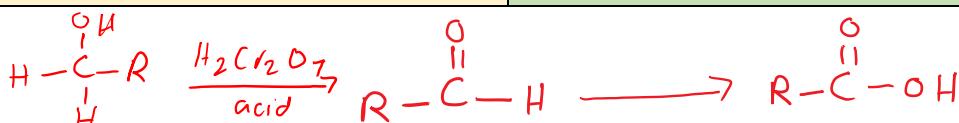


ex:

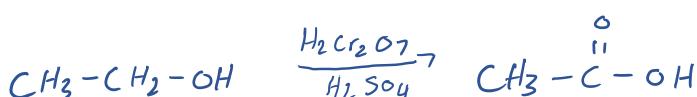


Regent: PCC, CrO_3

Catalyst: -



ex:

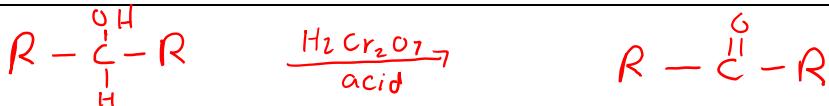


Regent: $H_2Cr_2O_7, Na_2Cr_2O_7$

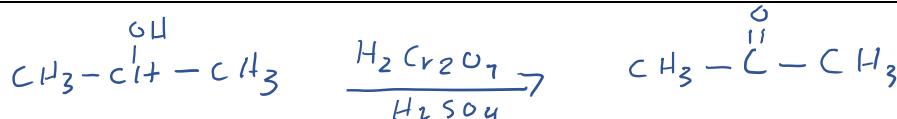
Catalyst: H_2SO_4 (acid)

Note:

4. Oxidation Reaction of secondary alcohol (2°)



ex:



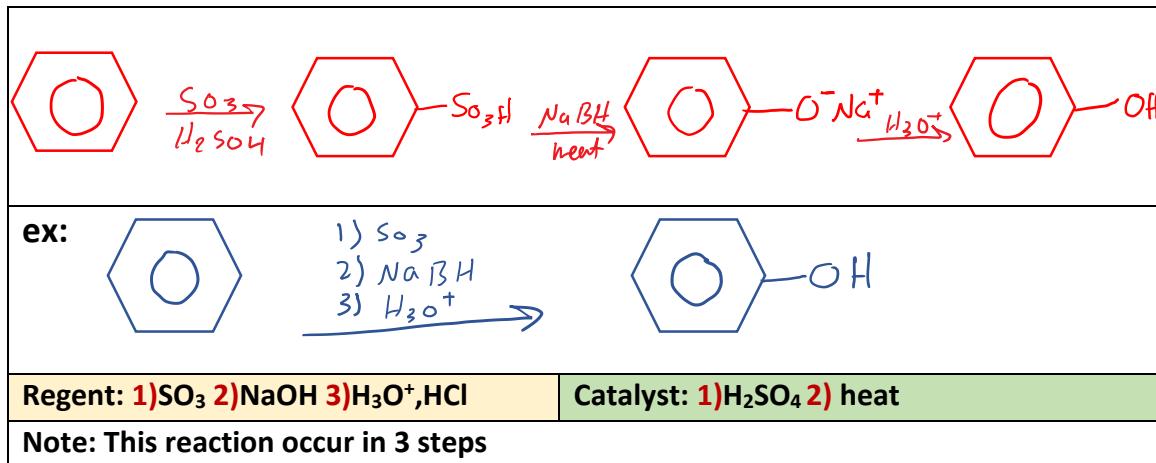
Regent: $H_2Cr_2O_7, Na_2Cr_2O_7$

Catalyst: H_2SO_4 (acid)

Note: There is no oxidation reaction for tertiary alcohol (3°) at all

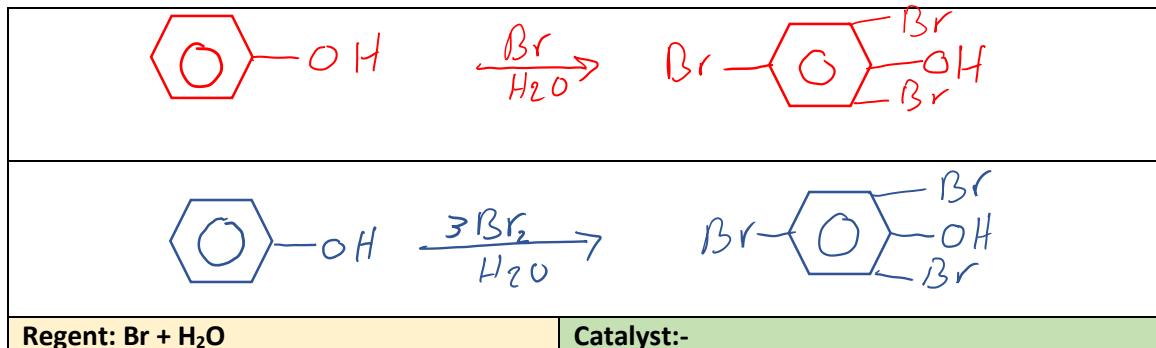
Preparation of Phenol

1. Alkali fusion of sulfonates

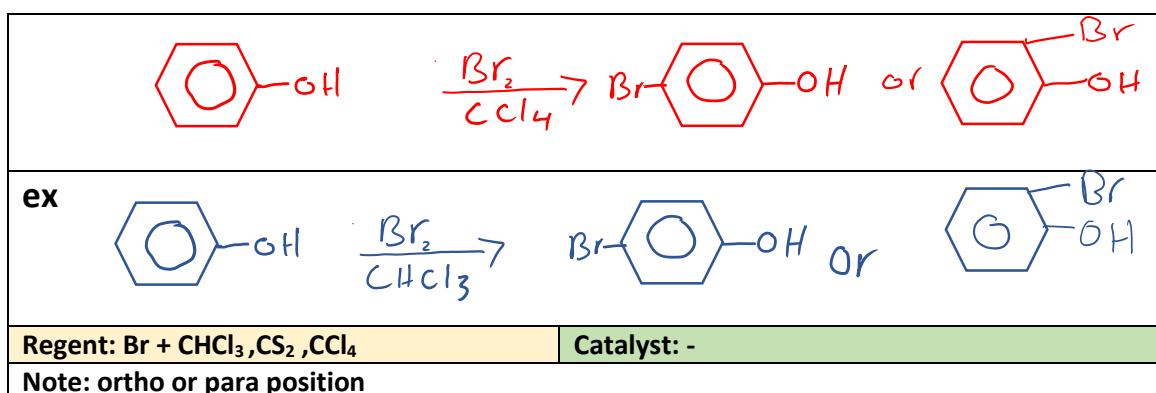


Reaction of Phenol

1. Halogenation with protic solvents (water)



2. Halogenation with aprotic solvents



Preparation of Ether

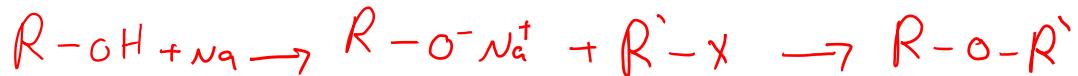
1. Ethers by dehydration of alcohols



Regent: - Catalyst: H^+ (acid) + heat

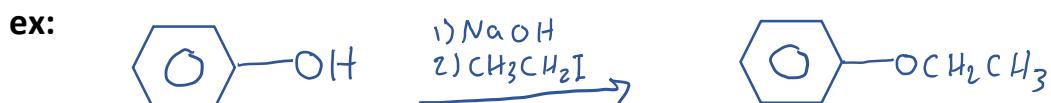
Note:

2. The Williamson synthesis of ethers



Regent: 1)Na ,NaH 2)R-X Catalyst: -

Synthesis of Phenyl Ethers



Regent: 1)NaOH 2)R-X Catalyst: -

Note: the second reagent has to be primary alkyl halide 1°

Reaction of ether

1. Cleavage of ethers by hot concentrated acids



Regent: H-X Catalyst: heat



Regent: 2H-X, conc H-X ,excess H-X Catalyst: heat

نهاية التفاعلات... عمل طلابي ان اصبتنا فمن الله وان أخطأنا فمن افسينا والشيطان ،،، لاتنسونا من دعائكم