

B.Sc. Physical Sciences (Chemistry) I Year

Chemistry- Chemical Energetics, Equilibria and Functional Organic Chemistry

Section B Organic Chemistry

Unit 6

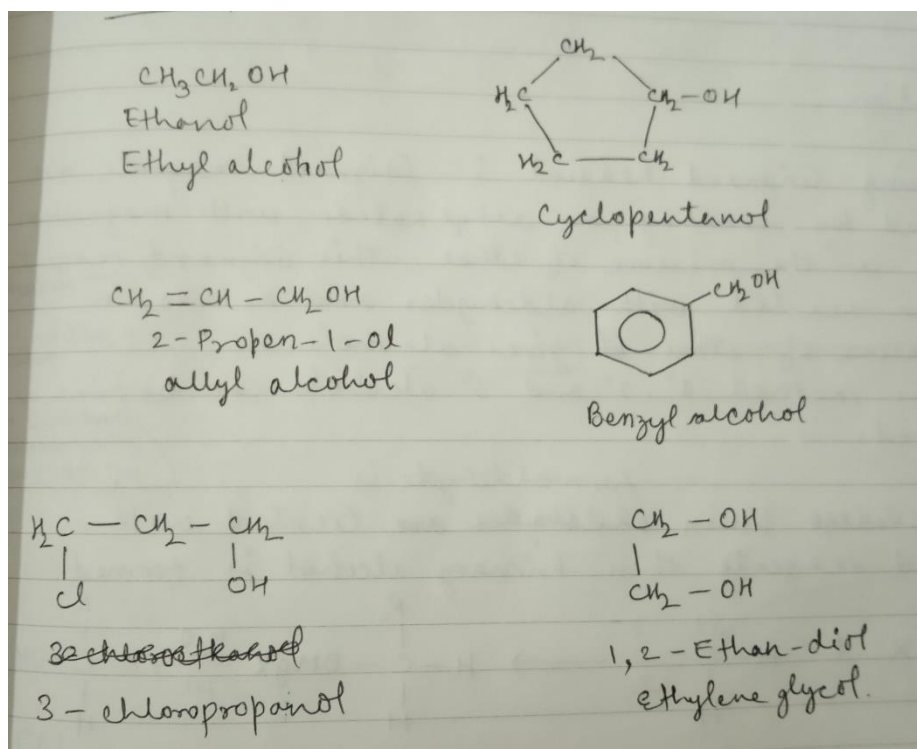
**Alcohols, Phenols, Ether, aldehydes and Ketones**

**Alcohols**

**Structure**

Alcohols are the organic compounds in which a hydroxyl group is present on a  $sp^3$  carbon atom. Based on the number of C - OH groups present on the molecule it can be monohydric, dihydric, trihydric or polyhydric alcohols.

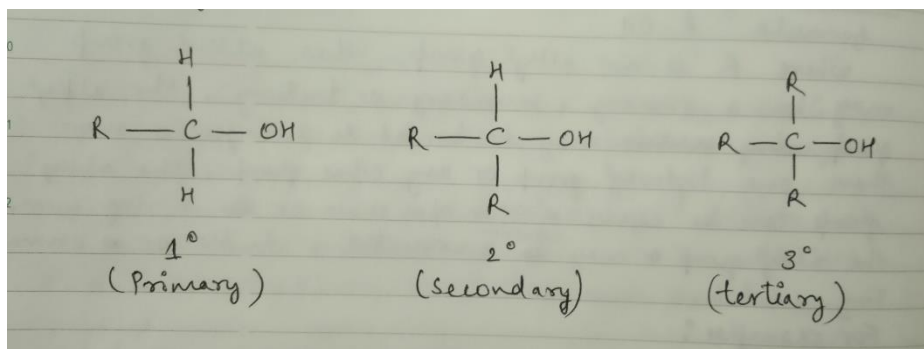
Examples:



**Classification of Alcohols**

Alcohols can be classified as Primary, secondary or tertiary alcohols based on the carbon atom to which the -OH group is attached.

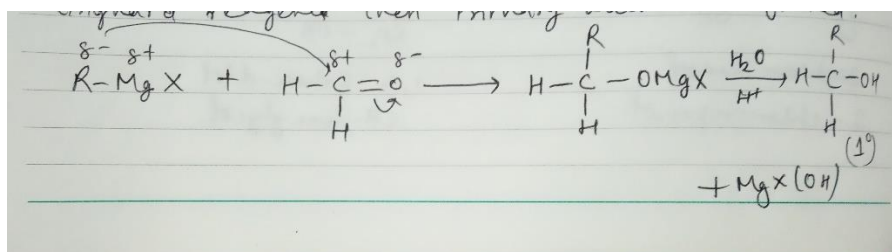
References: Organic Chemistry, R.T. Morrison, R.N. Boyd and S.K. Bhattacharjee, Pearson, 7<sup>th</sup> Edition and advance Organic Chemistry, Bahl and Bahl, S.Chand & Company Ltd.



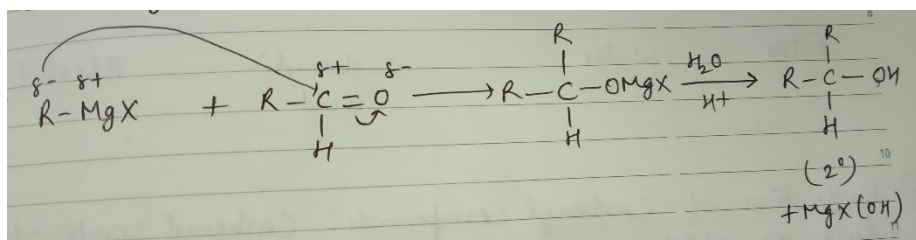
## Preparation

1) By Grignard reagents: Grignard reagents are prepared by treating an alkyl halide with magnesium ribbons in the presence of ether. This Grignard reagent when added to aldehydes and ketones it gives nucleophilic addition product which on hydrolysis in the presence of dilute acid gives alcohol.

(a) When formaldehyde is treated with Grignard reagent primary alcohols are formed.

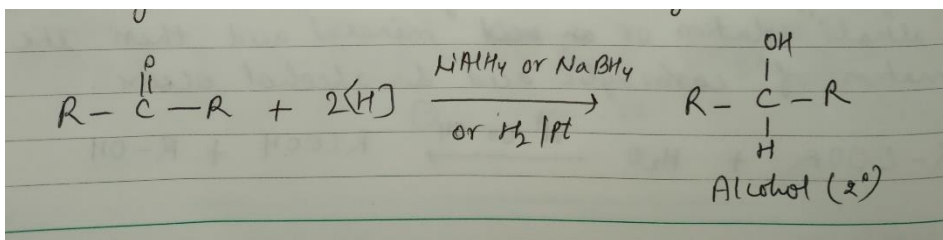


(b) When other aldehydes except formaldehyde are treated with Grignard reagent secondary alcohols are formed.

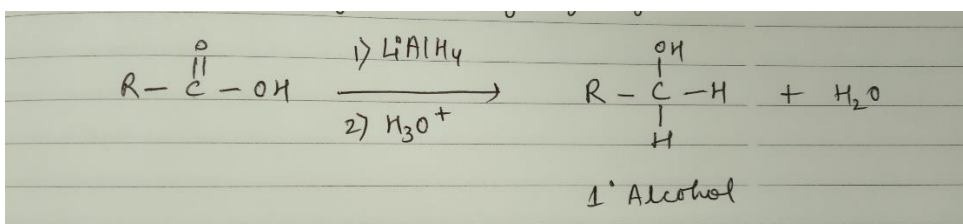


(c) When ketones are treated with Grignard reagent tertiary alcohols are formed.





- 5) Reduction of Carboxylic acids: Carboxylic acids can be converted to alcohols by treating it with lithium aluminium hydride followed by hydrolysis in the presence of dilute hydrochloric acid.



- 6) Reduction of Carboxylic esters: Carboxylic esters can be converted to alcohols by treating it with lithium aluminium hydride followed by hydrolysis in the presence of dilute hydrochloric acid.

