

What are **Alcohols**?

- ❖ Belong to a homologous series of organic compounds similar to alkanes and alkenes.
- ❖ The hydrocarbon chains contain the functional group -OH (hydroxyl group)

Structural Formula



=

Chemical Formula

$\text{C}_2\text{H}_5\text{OH}$ (molecular formula)

or

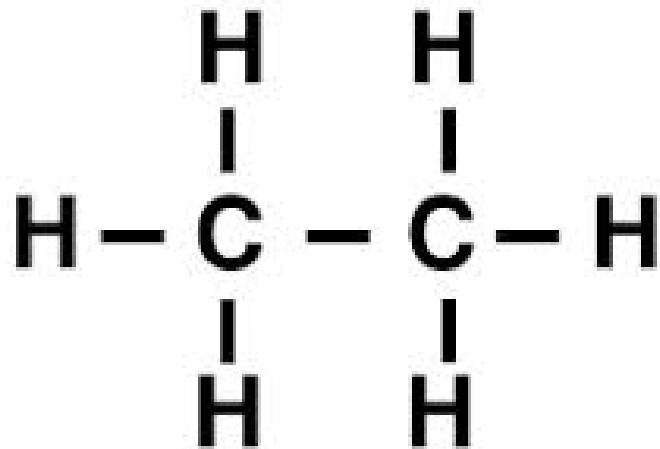
$\text{CH}_3\text{CH}_2\text{OH}$

(condensed structural formula)

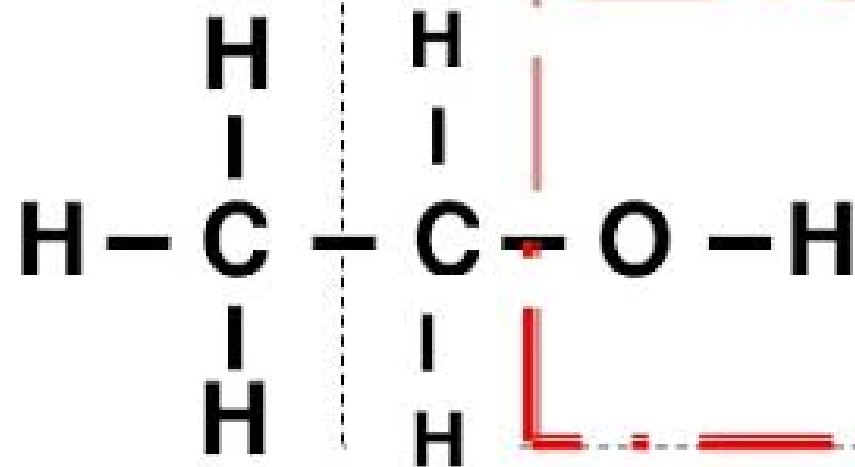
Naming Alcohol

- Replace the 'e' with 'anol' at the end of the name of the hydrocarbon

Example:



ethane^e



ethan^{anol}

ALCOHOLS

The organic compound which has -OH functional group are called **alcohols**.
The general formula for alcohol is $C_nH_{2n+1}OH$ / **R-OH**.

Classification of Alcohol:

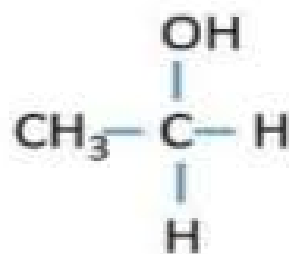
On the basis of -OH group attached to the carbon atom, alcohols are divided into three categories:

Primary alcohol: When the carbon atom attached to the hydroxyl group is bonded to only one carbon atom such type of alcohol is known as **primary alcohol**.

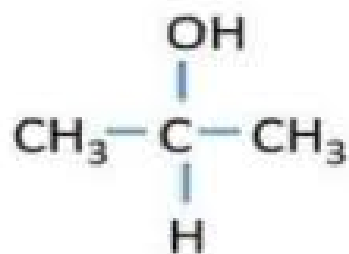
Secondary alcohol: When it is bonded to two carbon atoms such type of alcohol is known as **secondary alcohol**.

Tertiary alcohol: When it is bonded to three carbon atoms such type of alcohol is known as **tertiary alcohol**.

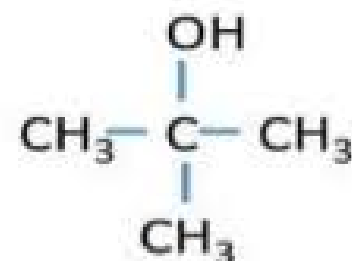
Primary alcohols



Secondary alcohols



Tertiary alcohols

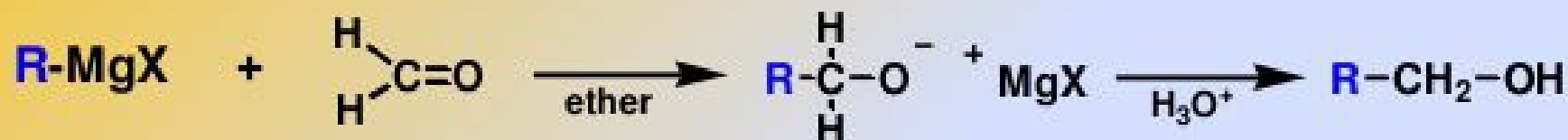


Polyhydroxy Alcohols

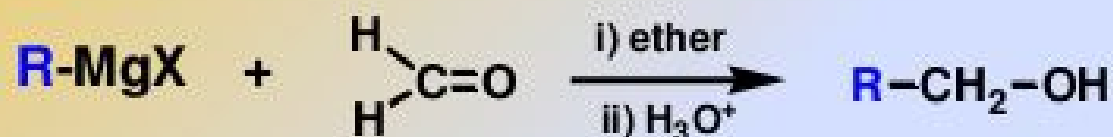
- Alcohols that contain more than one OH group - polyhydroxy alcohols.
- Monohydroxy: one OH group.
- Dihydroxy: two OH groups.
- Trihydroxy: three OH groups.

Grignard reactions of carbonyl compounds

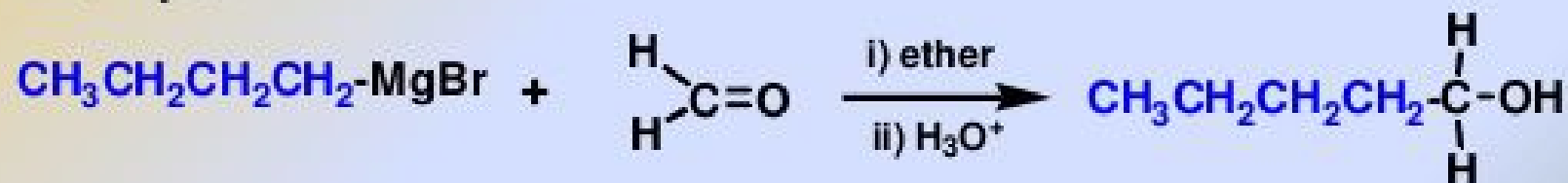
- Formaldehyde ($\text{H}_2\text{C}=\text{O}$) reacts with Grignard reagents giving primary alcohol.



or



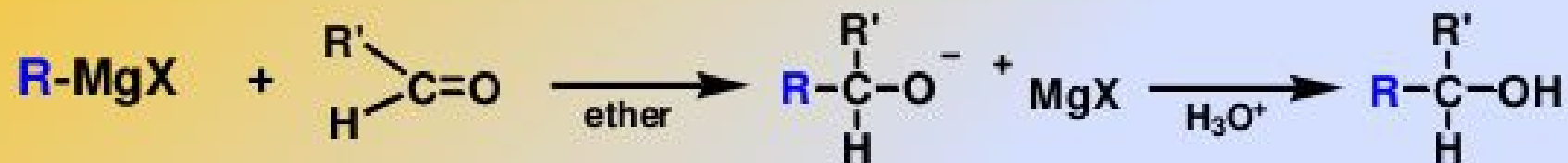
Example:



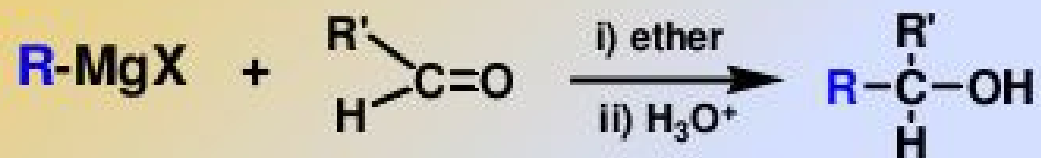
butylmagnesium bromide

1-pentanol (92%)

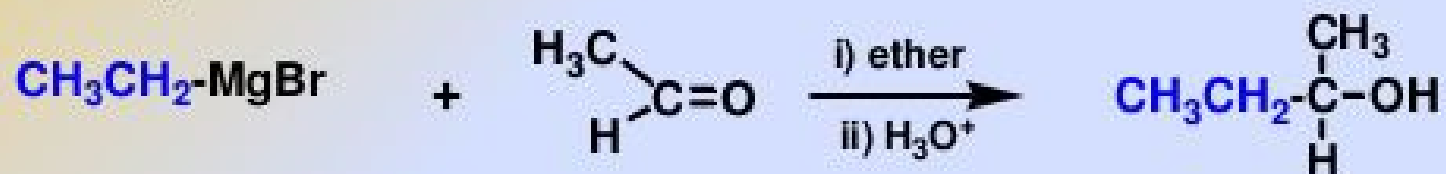
- Aldehydes reacts with Grignard reagents giving secondary alcohols.



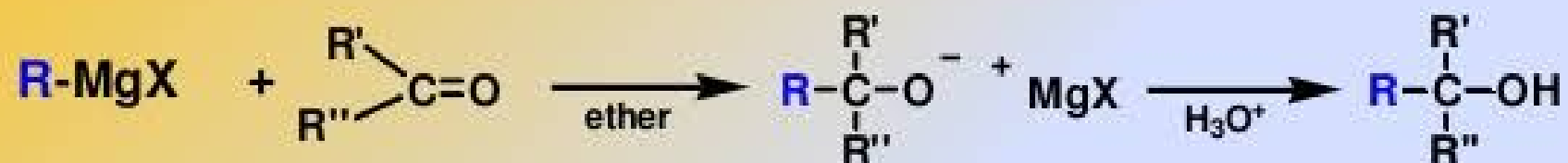
or



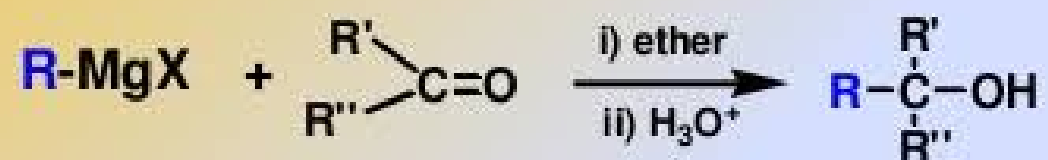
Example:



- Ketones reacts with Grignard reagents giving tertiary alcohols.



or



Example:

