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COLLEGE: MEDICINE AND HEALTH SCIENCES

DEPARTMENT: PHARMACOLOGY

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CHM 102 ASSIGNMENT

1. Major classification of Alcohols and examples

a) Classification based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group.

If the numbers of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called a primary alcohol.

If it is one hydrogen atom, it is called a secondary alcohol,

And if there is no hydrogen atom, it is tertiary alcohol.

Examples are; CH_3OH -methanol(primary alcohol), $\text{CH}_3\text{CH}_2\text{OH}$ (ethanol) (Primary Alcohol)

b) Classification based on the number of hydroxyl group they possess.

Monohydric alcohols have one hydroxyl group present.

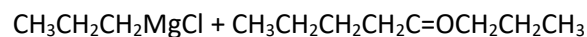
Dihydric alcohols or glycols have two hydroxyl groups present

while trihydric alcohols or triols have three hydroxyl groups present in the alcohol structure. Polyhydric alcohols or polyols have more than three hydroxyl groups present.

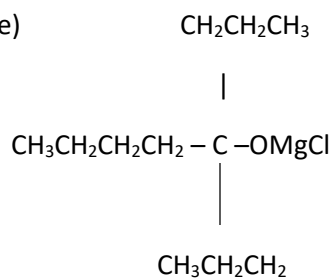
Examples are; $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$ hexane-2,4-diol (Dihydric alcohol)

$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ propanol(monohydric alcohol).

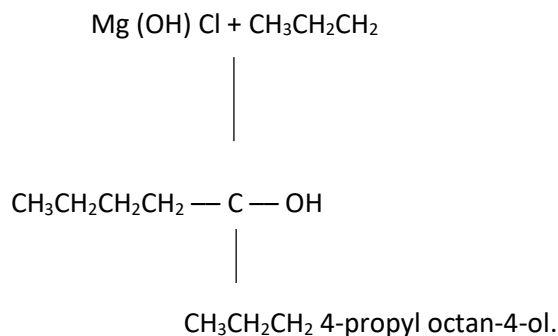
2. Grignard synthesis of alcohol.



(Grignard reagent; Propyl magnesium chloride)

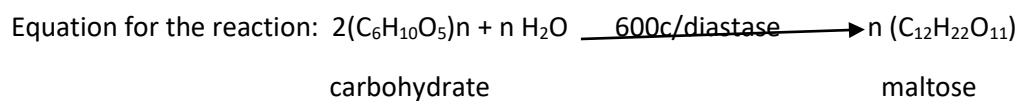


React with water ($\text{H}+\text{OH}^-$) and dilute acid

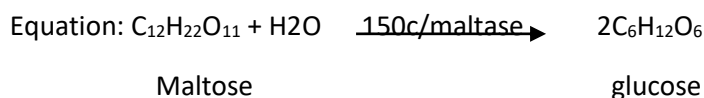


3. Industrial manufacture of ethanol

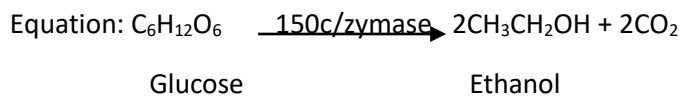
i) Carbohydrate such as starch is broken down by diastase contained in malt at a temperature of 600c to give maltose.



ii) Maltose is broken down into glucose by maltase found in yeast at a temperature of 150c to give glucose.

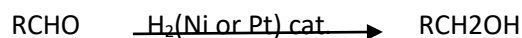


iii) Glucose is converted to ethanol at constant temperature of 150c by enzyme zymase also contained in yeast.

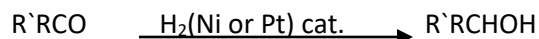


4) Reduction of aldehydes and ketones.

Aldehydes and ketones are reduced to primary and secondary alcohols respectively by reaction with hydrogen in the presence of a platinum or nickel catalyst or with complex metal hydride, such as lithium tetrahydridoaluminate (III) (LiAlH₄)



Aldehyde or LiAlH₄ primary alcohol



Ketone or LiAlH₄ secondary alcohol

Specific examples include:

