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19/MHS01/069
MBBS
CHEMISTRY 101 ASSIGNMENT

1. CLASSIFICATION OF ALCOHOL WITH EXAMPLES

-i. This is based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. This is ~~classified into~~: divided into:
Primary alcohol(1°)- If the number of hydrogen atoms are three or two attached.
Secondary alcohol(2°)- If the number of hydrogen atom is one.
Tertiary alcohol(3°)- If there is no hydrogen atom attached.
Example: CH_3OH-(1°), $CH_3CH(OH)CH_3$ (2°), $(CH_3)_3C$-OH-2 (3°)

-ii This is based on the number of hydroxyl groups they Posses. This is divided into:
Monohydric alcohol- If one hydroxyl group is present in the alcohol structure.
Dihydric alcohol- If two hydroxyl group is Present in the alcohol structure.
Trihydric alcohol- If three hydroxyl group are present in the alcohol structure.
Polyhydric alcohol- If they have more than three hydroxyl group present in the alcohol structure.
Example: $CH_3CH_2CH_2OH$ Propanol (Monohydric), $HOCH_2CH_2OH$ Ethane-1,2-diol (Dihydric), $OHCH_2CH(OH)CH_2OH$ Propane-1,2,3-triol (Trihydric), $CH_3CH(OH)CH(OH)CH(OH)CH(OH)CH(OH)CH_3$ Heptane-2,3,4,5,6-Pentaol (polyhdric).

2. THE SOLUBILITY OF ALCOHOLS IN WATER, ORGANIC SOLVENTS

-Lower alcohol with up to three carbon atms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass. All monohydric alcohols are soluble in organic solvents.

3 SHOW THE THREE STEPS IN THE INDUSTRIAL MANUFACTURE OF ETHANOL. Equation of reaction are mandatory.

- Starch containing materials include molasses, Potatoes, cereals, rice etc. These starches are broken down on warming with malt to 60°c for a specific period of time are then converted to maltose by an enzyme called diastase containing in the malt

$$2(C_6H_{10}O_5)_n + nH_2O \xrightarrow{60^\circ c/\text{diastase}} nC_{12}H_{22}O_{11}$$

Carbohydrate Water Maltose

The maltose is then broken down into glucose on addition of yeast which contains an enzyme called maltase at a temperature of 15.

$$C_{12}H_{22}O_{11} + H_2O + H_2O \xrightarrow{15^\circ c/\text{maltase}} 2C_6H_{12}O_6$$

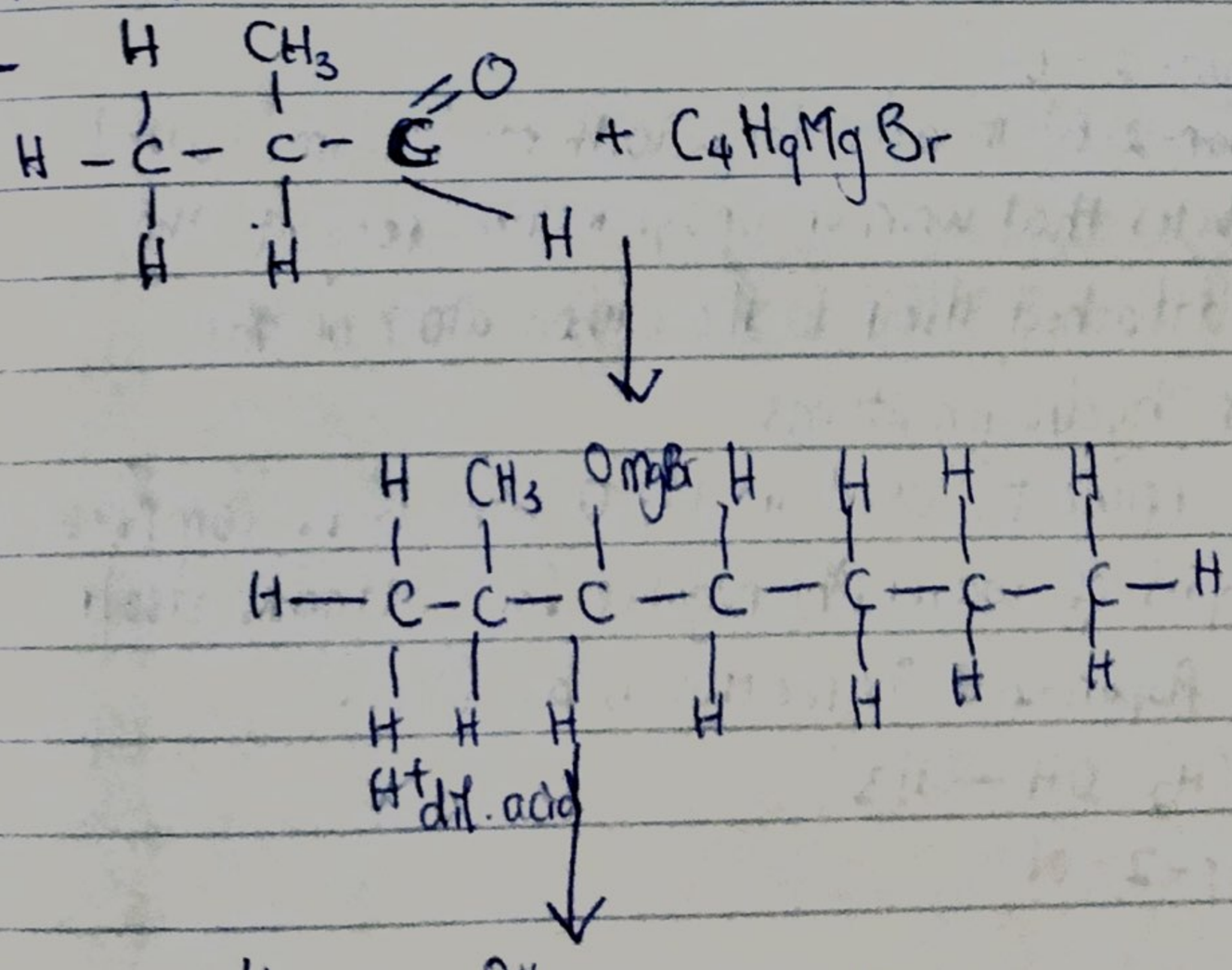
Maltose Water glucose

The glucose is then converted into alcohol at a constant temperature of 15°c in the presence of an enzyme called Zymase which is contained in the yeast.

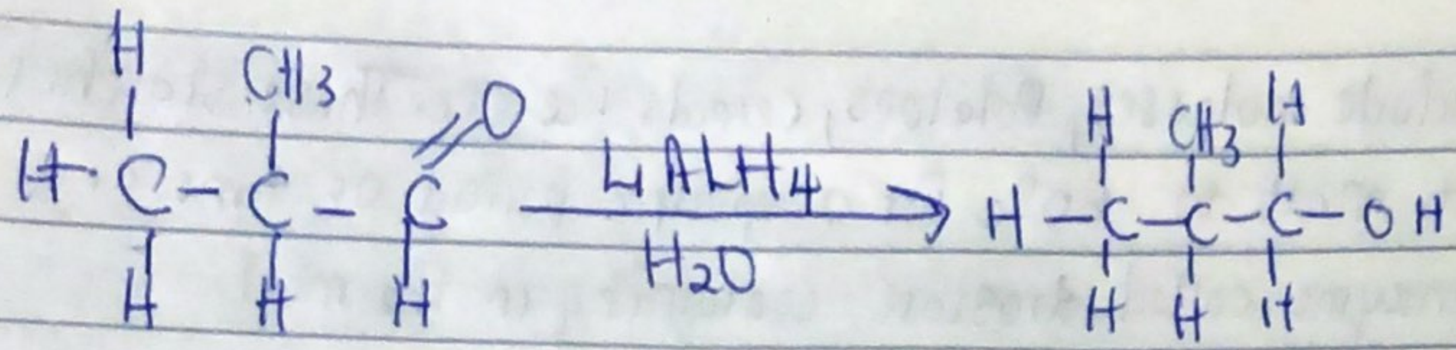
$$2C_6H_{12}O_6 \xrightarrow{15^\circ c/\text{Zymase}} 2C_2H_5OH + 2CO_2$$

Glucose Ethanol Carbon dioxide

4) SHOW THE REACTION BETWEEN 2-METHYL PROPANONE AND BUTYLMAGNESIUMCHLORIDE

- 

7. SHOW THE REDUCTION REACTION OF 2-METHYLPROPANAL



2methylpropanal — 2 methyl propanal

8. PROPOSE A SCHEME FOR THE CONVERSION OF PROPAN-1-OL to Propan-2-OL

a. Dehydration of Propan-1-ol to propene.

When Propan-1-ol is treated with Concentrated Sulfuric acid (CH_2SO_4) the Phenomenon called dehydration occurs due to which a water molecule from Propan-1-ol gets eliminated.

Due to this Propan-1-ol gets converted into propene. The reaction is as follows

$CH_3CH_2CH_2OH \xrightarrow{Conc\ H_2SO_4} CH_3CH=CH_2$

Propan-1-ol — Propene

b. Hydrolysis of Propene to Propan-2-ol

Propene can be hydrolysed to propan-2-ol in accoidance with mechanism called Markownikoffs reaction which states that when an unsymmetrical reagent the negative Part of the reagent gets attached itself to the carbon atom of the alkene which has less number of hydrogen atoms.

In this case, the unsymmetrical reagents used in H_2O which is compressed of H^+ and OH^+ Part. Due to hydrolysis of water, the negative Part attaches itself to the Propene and thus coverts it as Propan-2-ol. The reaction is as follows:

$CH_3-CH=CH_2 \xrightarrow{H_2O} CH_3-CH_2-OH-CH_3$

Propene — Propan-2-ol