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CHEM 102

19/MHS01/211

### 1. Classification of Alcohols

- Alcohols are classified according to the number of hydrogens attached to the carbon atom ~~considering~~ containing the hydroxyl group. It is called primary alcohol if it has three or two hydrogen atom attached to the carbon atom bearing the hydroxyl group. One hydrogen atom attached to the carbon atom bearing the hydroxyl group, it is a secondary alcohol and if it has no hydrogen atom attached to the carbon bearing the hydroxyl group, it is a tertiary

containing the hydroxyl group. It is called primary alcohol if it has three or two hydrogen atom attached to the carbon atom bearing the hydroxyl group. One hydrogen atom attached to the carbon atom bearing the hydroxyl group, it is a secondary alcohol and if it is has no hydrogen atom attached to the carbon bearing the hydroxyl group, it is a tertiary alcohol. Example  $\text{CH}_3\text{OH}$  - Methanol (Primary alcohol)

- Alcohols are also classified based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group. Dihydric alcohols have two hydroxyl group and trihydric alcohol have three hydroxyl group.

Example:  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$  - Propanol (Monohydric alcohol)

2

## 2 Solubility of alcohols in water

Their water solubility decreases with increasing relative molecular mass. <sup>Lower</sup> Alcohols with up to three carbon atoms in their molecules are soluble in water due to hydrogen bond with water.

groups they form. Divalent alcohols have two hydroxyl group and trihydric alcohol have three hydroxyl group.

Example:  $\text{C}_3\text{H}_7\text{O}_2$  - Propanol (Monohydric alcohol)

2

2 Solubility of alcohols in water

Their water solubility decreases with increasing relative molecular mass. <sup>lower</sup> Alcohols with up to three carbon atoms in their molecules are soluble in water due to hydrogen bond with water.

Solubility of alcohols in organic solvent

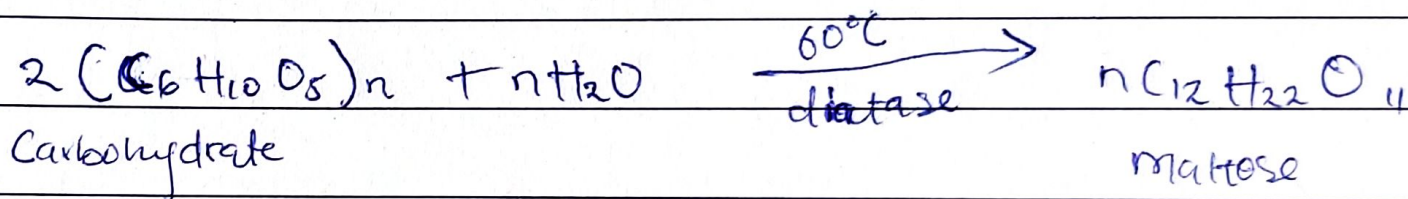
All monohydric alcohols are soluble in organic solvent.

~~There~~

### 3 Manufacture of ethanol

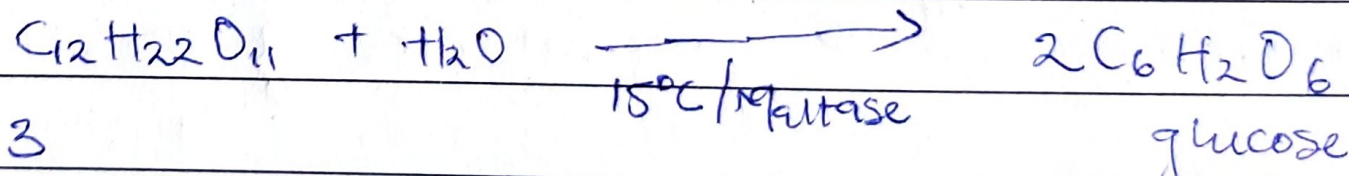
#### • Step 1

starch is broken converted into maltose by the enzyme diastase contained in malt at warming at  $60^{\circ}\text{C}$  for a specific period of time



#### • Step 2

Maltose is broken down into glucose on addition of yeast containing the enzyme maltase and at a temperature of  $15^{\circ}\text{C}$

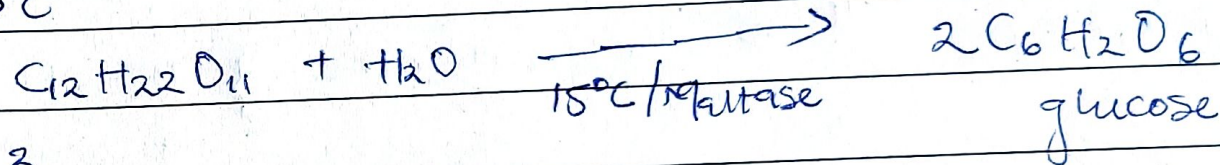


#### • Step 3

2 (C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>)<sub>n</sub> + H<sub>2</sub>O → ~~glucose~~ maltose  
 Carbohydrate

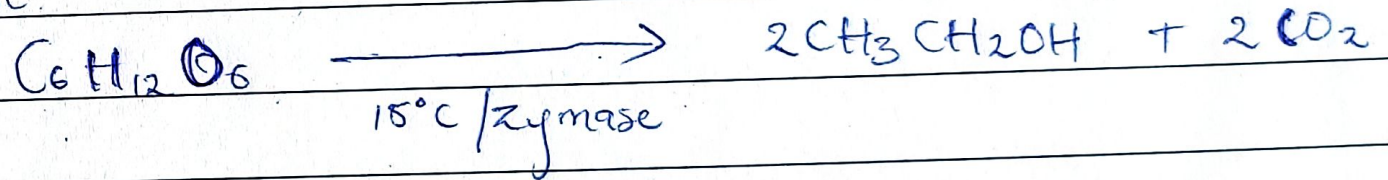
Step 2

Maltose is broken down into glucose on addition of yeast containing the enzyme maltase and at a temperature of 15°C

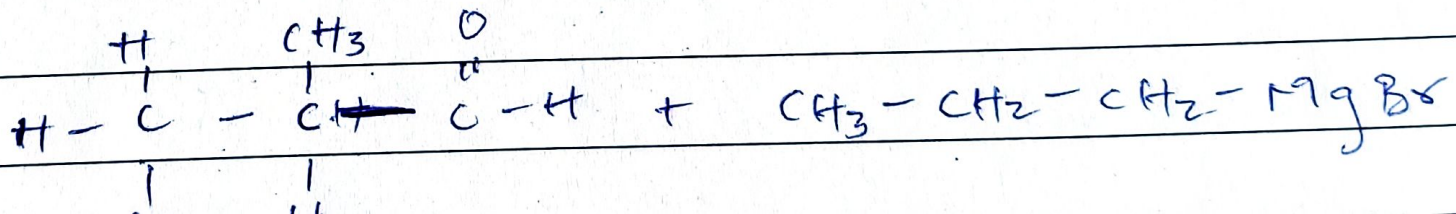


Step 3

The glucose at constant temperature of 15°C is then converted into alcohol by the enzyme Zymase contained also in yeast.

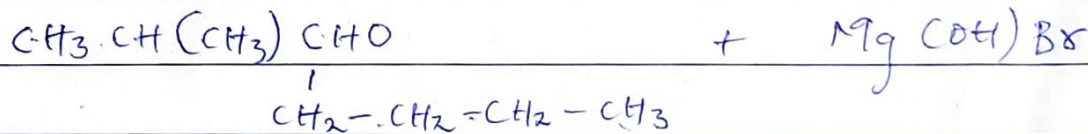
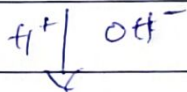
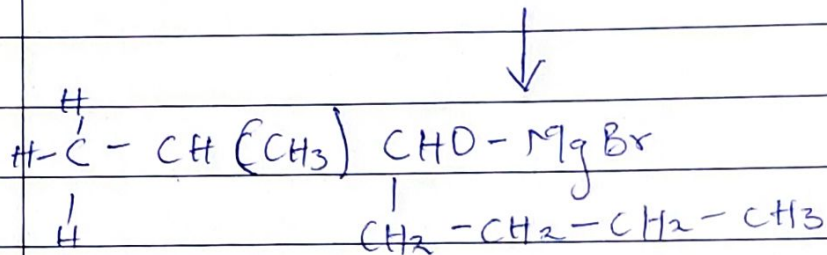
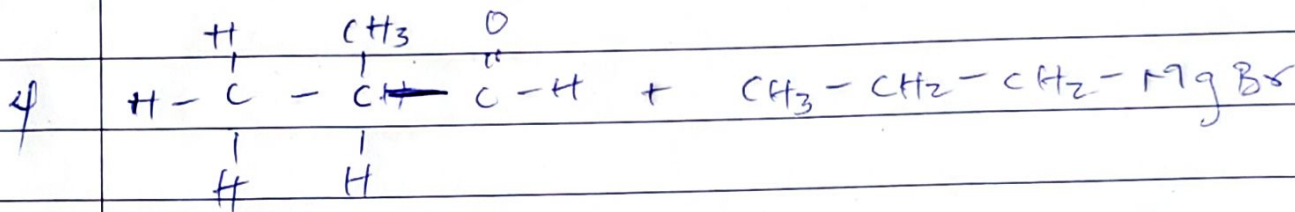
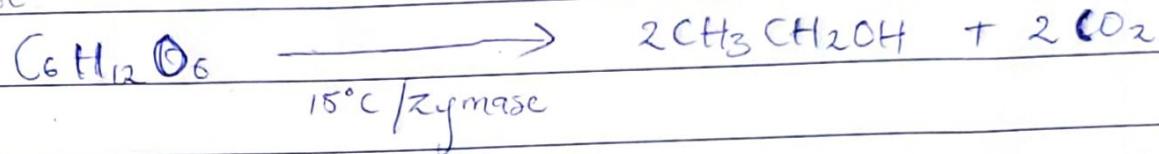


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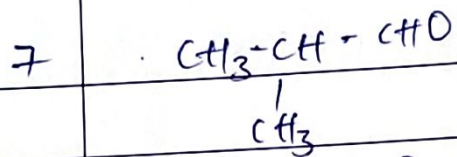


Step 3

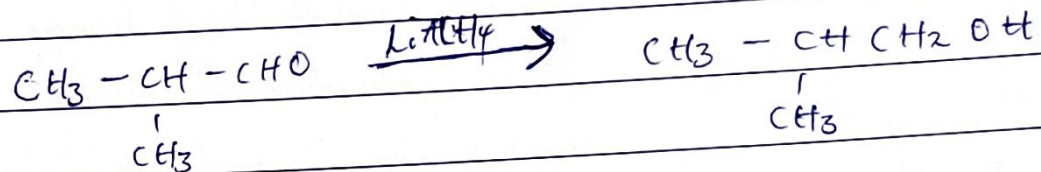
The glucose at constant temperature of  $15^{\circ}\text{C}$  is then converted into ~~the~~ alcohol by the enzyme Zymase contained also in yeast



2-methyl hept 3-one



Reduction



Primary alcohol alcohol

8 Propan-1-ol to propan-2-ol

