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Chemistry Assignment

1) Classification of Alkanols

a) They can be classified based on the number of hydrogen atom ^{attached} present to the carbon atom carrying the hydroxyl group. If the number of hydrogen atom attached to the carbon atom carrying the hydroxyl group are ^{three} 3 or ^{two} 2, it is called primary alcohol. If its 1 hydrogen atom it is called secondary alcohol and if there is no hydrogen atom it is called tertiary alcohols.

E.g $\text{CH}_3\text{OH} \rightarrow$ methanol (1°) $\text{CH}_3\text{CH}_2\text{OH}$ ethanol, $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ propan-1-ol,
 $(\text{CH}_3)_3\text{C}-\text{OH} \rightarrow$ 2-methylpropan-2-ol (3°).

b) They can also be classified on the number of hydroxyl group they possess. Monohydric alcohol has one hydroxyl group present in the alcohol structure. Dihydric alcohols have 2 hydroxyl group while ^{tri}hydric have ~~two~~ three hydroxyl group. while polyhydric have more than ~~three~~ three.

E.g $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

Monohydric

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

Dihydric

~~$\text{CH}_2\text{OHCH}_2\text{CH}_2\text{OH}$~~

Trihydric

2) Solubility of alcohol in water:

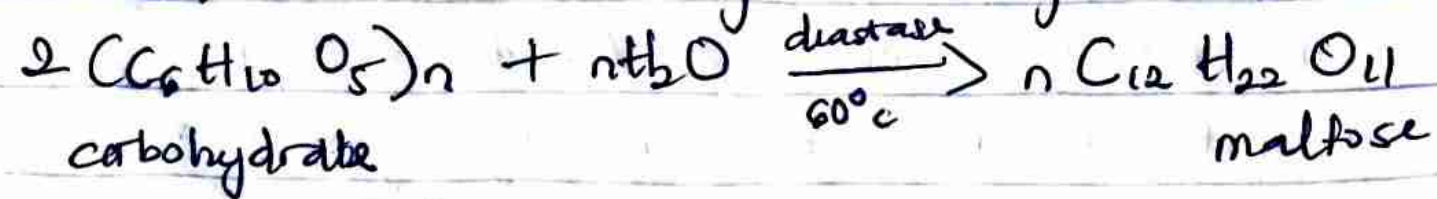
Lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass.

All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohol is largely due to their ability to form hydrogen bonds with water molecules.

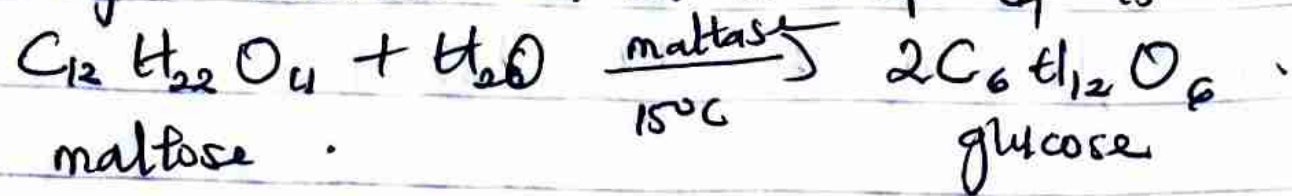
3) Production of Ethanol

This is done through the process of fermentation. The biological catalysts, enzymes found in yeast break down carbohydrate molecules into ethanol to give a yield of 95%.

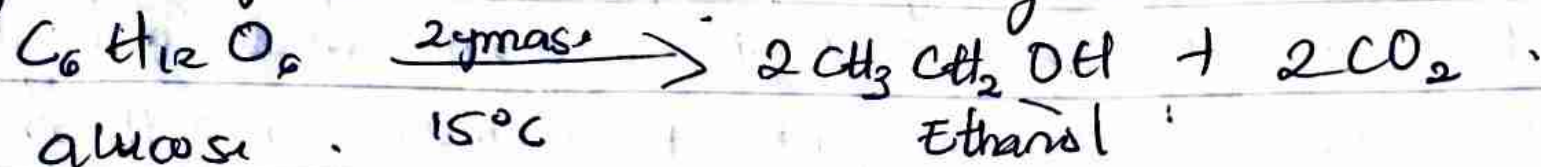
The starch containing material e.g. rice, cereals including and on warming with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase



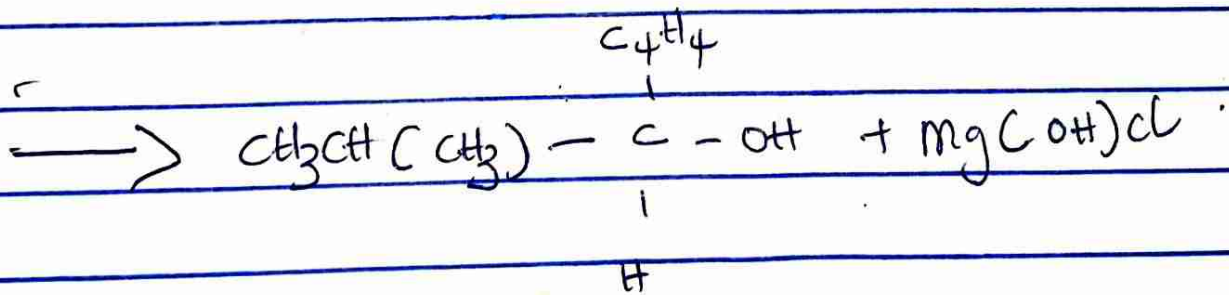
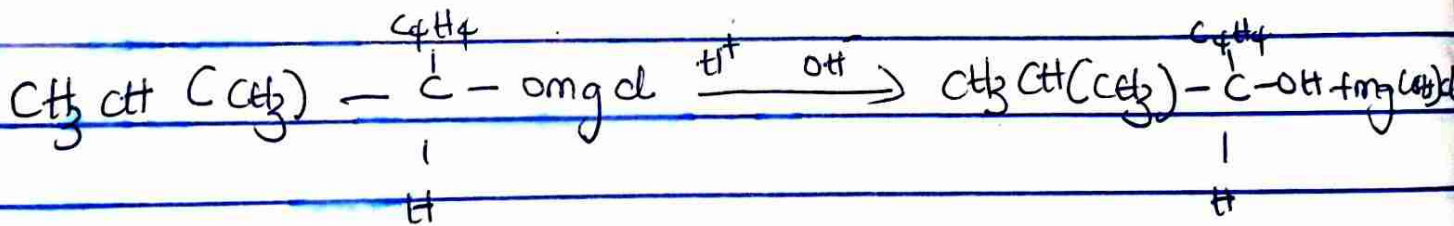
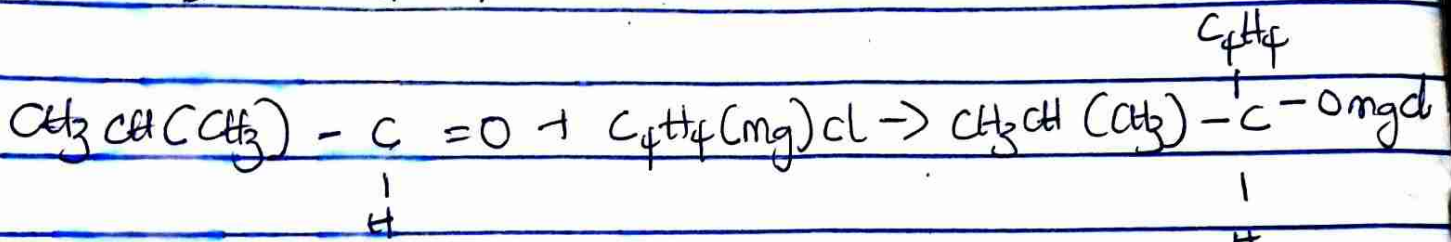
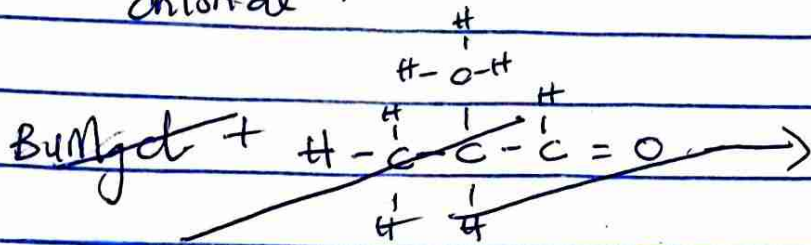
maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temp of 15°C.



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

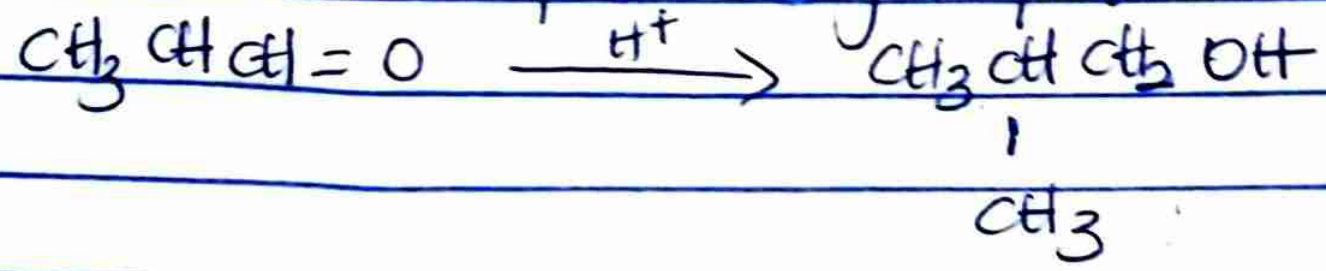


4) Reaction between 2 methyl propanol and butylmagnesium chloride.



2-methyl-heptan-3-ol.

7) Reduction of 2 methyl propanol



8) ~~1~~ propan-1-ol to propan-2-ol

