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### Nursing

19/MHS02/013

1a) Classification based on the number of hydrogen atoms attached to the carbon atoms containing the hydroxyl group

They can be classified into;

i) Primary Alcohol; If the numbers of hydrogen atoms attached to the carbon atoms bearing the hydroxyl group is three or two. egg CH<sub>3</sub>OH Methanol

ii) Secondary Alcohol; If it's one hydrogen atoms, it's called secondary alcohol. Eg CH<sub>3</sub>CH(OH)CH<sub>3</sub> Propan-2-ol

iii) Tertiary Alcohol; it is a tertiary alcohol there is no hydrogen atoms attached to the carbon atoms bearing the hydroxyl group.

b) Classification based on the number of hydroxyl group present in the alcohol structure;

They are also classified into 3;

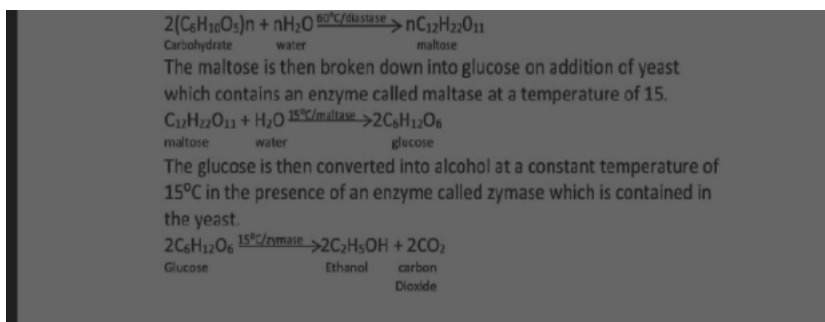
i) Dihydric Alcohol; They are also called Glycols and they have two hydroxyl group present in the alcohol structure.

ii) Trihydric Alcohol: They have three hydroxyl group present in the alcohol structure.

iii) Polyhydric Alcohol; They have more than three alcohol present in the alcohol structure

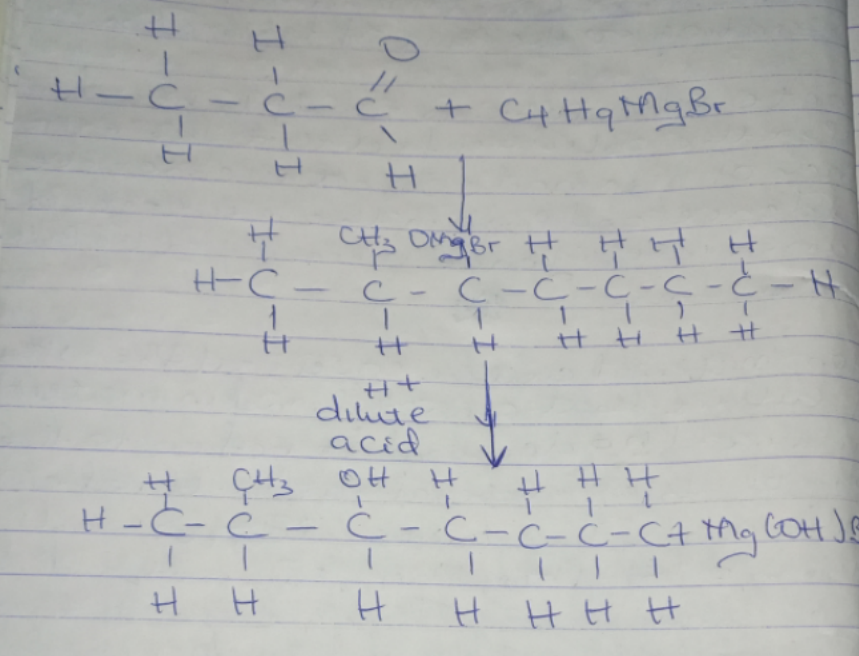
2) Lower Alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass. All monohydric alcohol are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

3) Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process called Fermentation. The starch containing materials include molasses, potatoes, cereals, rice and on warming malt to 60°C for a specific period of time are converted into maltose by enzyme diastase contained in the malt.

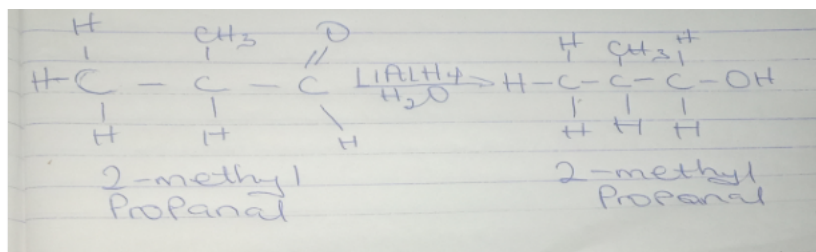


Grignard synthesis between 2-methyl Propanal and butyl Magnesium chloride

4)



7)



8)

8. Propose a scheme for the conversion of propan-1-ol to propan-2-ol.

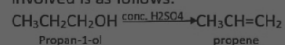
Answers.

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 (H<sub>2</sub>SO<sub>4</sub>) 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 involved is as follows.



b. Hydrolysis of propene to propan-2-ol.

Propene can be hydrolysed to propan-2-ol in accordance 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<sub>2</sub>O which is composed of H<sup>+</sup> and OH<sup>-</sup> part. Due to hydrolysis of water, the negative part attaches itself to the propene and thus converts it as propan-2-ol. The reaction is as follows:

