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Dept: MBBS

SUBJECT: CHEMISTRY ASSIGNMENT

1) This is based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called a primary alcohol ( $1^\circ$ ). If it is one hydrogen atom, it is called secondary alcohol ( $2^\circ$ ) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol ( $3^\circ$ ).

Examples are

$\text{CH}_3\text{OH}$  - Methanol ( $1^\circ$ )

$\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$  - Propan-2-ol ( $2^\circ$ )

$\text{C}(\text{CH}_3)_3\text{COH}$  - 2-Methylpropan-2-ol ( $3^\circ$ )

2) This is based on the number of hydroxyl groups they possess

Examples are:

1)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$  (Propanol) - monohydric alcohol

$\text{HOCH}_2\text{CH}_2\text{OH}$  - Ethane-1,2-diol (Dihydric alcohol)

$\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$  - Propan-1,2,3-triol (Trihydric alcohol)

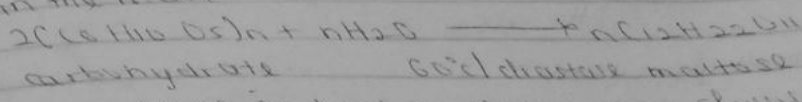
3) Solubility of alcohols in water

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 alcohols is

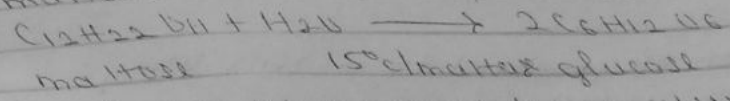
largely due to their ability to form hydrogen bonds with water molecules.

3) Industrial Manufacture of Ethanol:

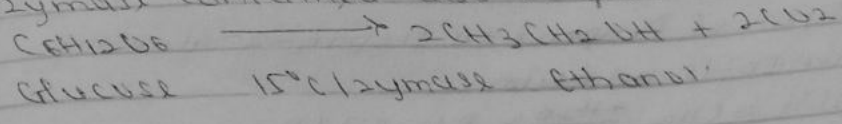
Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological synthesis involves hydrolysis of starch into its constituent monosaccharides by the enzyme amylase. The starch containing materials include malted barley, cereals, rice and so on. Heating with malt at 60°C for a specific period they are converted into maltose by the enzyme diastase contained in the malt.



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



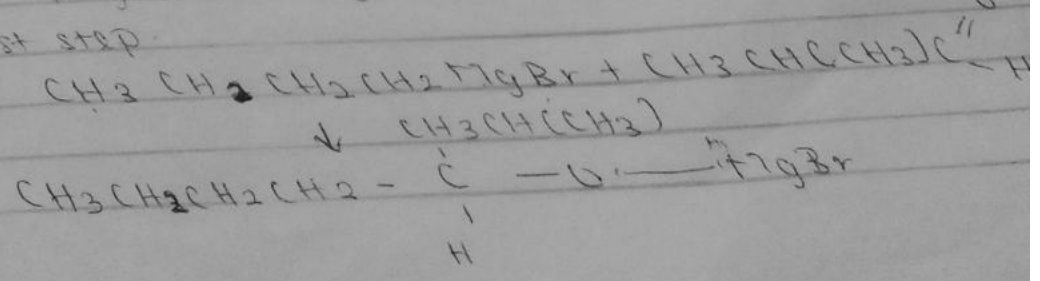
The glucose at constant temperature of 15°C is then converted into alcohol by the enzyme zymase contained also in yeast

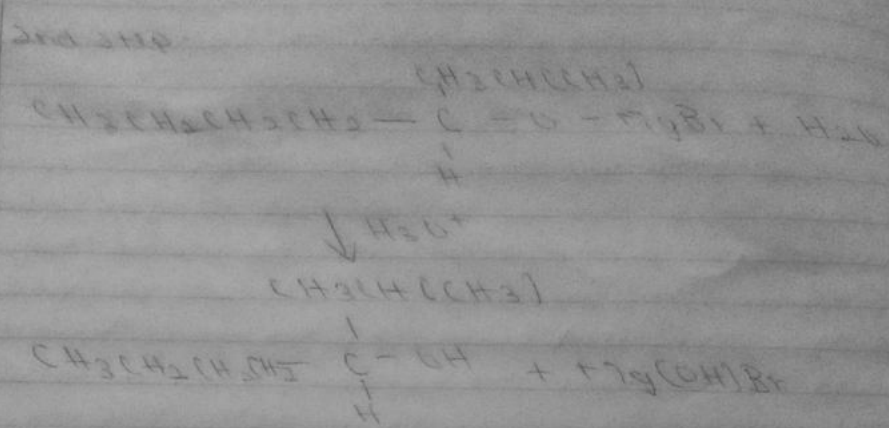


4) React a named Grignard reagent with 2-methyl propanal

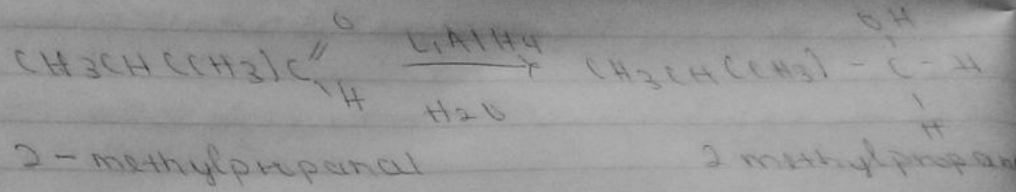
Grignard reagent - Butylmagnesium chloride

1st step:

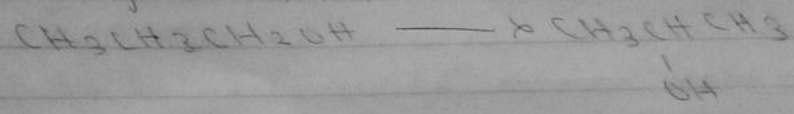




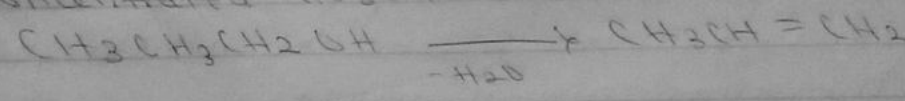
7) Reduction of 2-methylpropanal using lithium aluminium hydride



8) Using Markownikoff's rule



9) Dehydration of propanol to propene using concentrated H<sub>2</sub>SO<sub>4</sub>.



10) Hydrolysis of Propene to Propan-2-al using Markownikoff's addition

