

NAME:

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DEPT: MEDICINE AND SURGERY

① Alcohols are very important Organic Compounds. Discuss briefly their classification and give an example.

Ans: → 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 two or three it is a primary alcohol (1°). If it is one hydrogen atom, it is called secondary alcohol (2°) and if no hydrogen atom is attached to the Carbon atom bearing the hydroxyl group, it is called tertiary alcohol.

Examples:- Primary alcohol (1°) = Methanol

- Secondary alcohol (2°) = propan-2-ol

- Tertiary alcohol (3°) = 2-Methylpropan-2-ol

→ Based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure.

Dihydric alcohols are also called Glycols have two hydroxyl groups present in the structure while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol. polyhydric alcohols or polyols have more than three hydroxyl groups.

Examples:- Monohydric alcohols = propanol

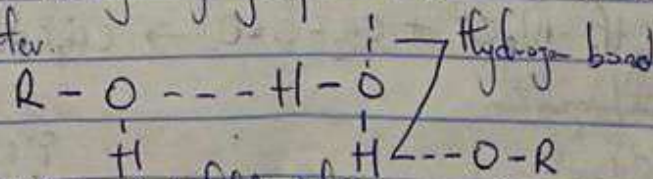
Dihydric alcohol = Ethane-1,2-diol

Trihydric alcohol = Propane-1,2,3-triol

Polyhydric alcohol = Heptane-2,3,4,5,6-pentanol

② Discuss the solubility of alcohols in Water, Organic Solvent

→ Generally hydrocarbons are not soluble in water but alcohols are because of the hydroxyl groups in their molecules can form hydrogen bond with water.



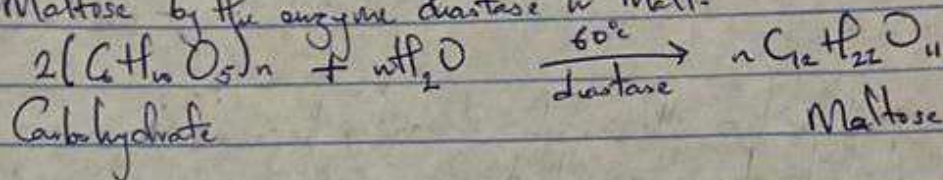
Solubility and Volatility ^{decrease} ~~become~~ as the number of Carbon atoms.

increases in alcohols because the molecules are stuck together due to hydrogen bonding. They are difficult to separate and draw off into the

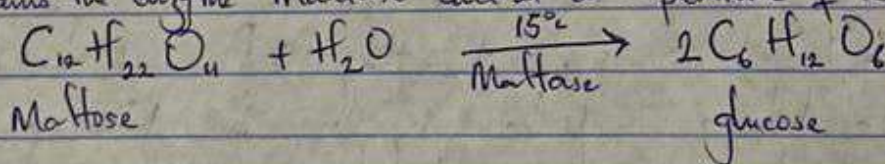
Alkanes; phase. Primary alkanes with more than five carbon atoms are insoluble in water. (6)

(3) Show the 3 steps in the industrial manufacture of ethanol. Equations are mandatory.

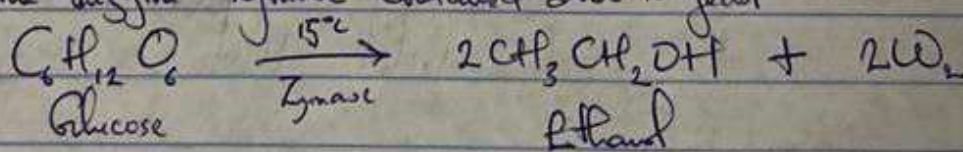
Ans: (a) Carbohydrates such as starch, are major groups of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalysts, enzymes found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%. The starch containing materials include molasses, potatoes, cereals, rice etc and on warming with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase in malt.



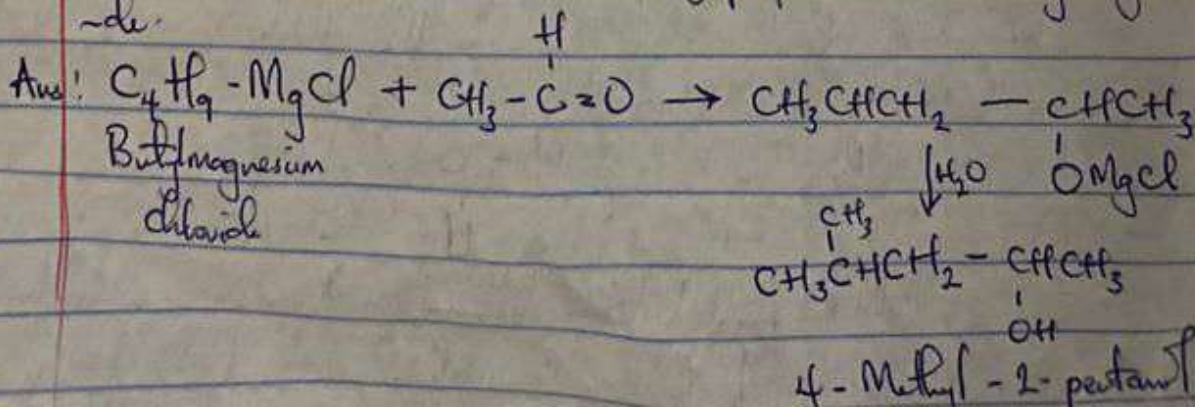
(b) The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15°C



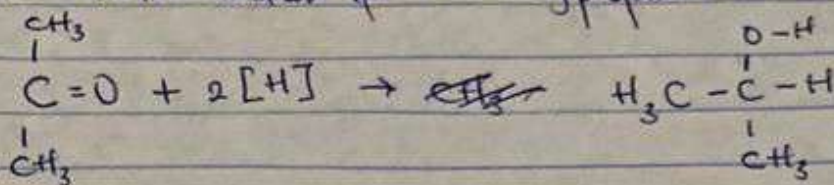
(c) The glucose at constant temperature of 15°C is then converted into alcohol by the enzyme Zymase contained also in yeast



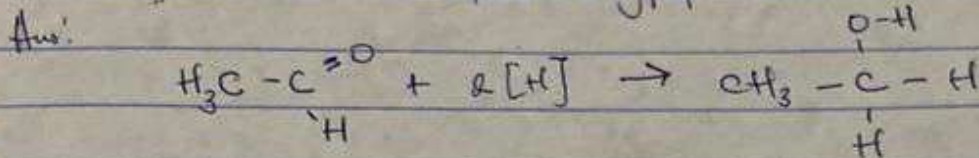
(4) Show the reaction between 2-methylpropanal and butylmagnesium chloride.



⑥ Show the reduction reaction of 2-Methylpropanone

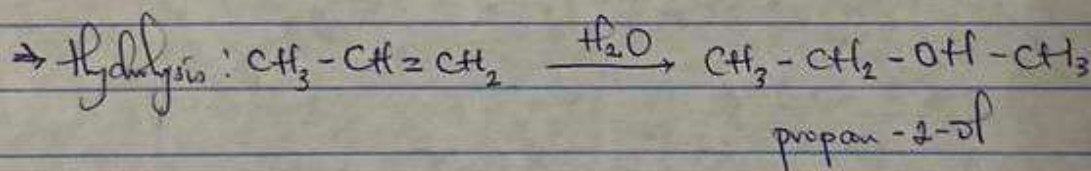
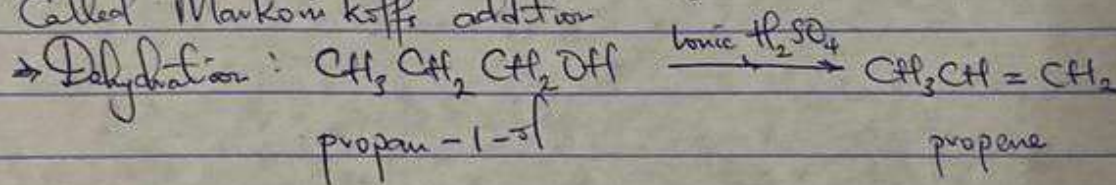


⑦ Show the reduction reaction of 2-Methylpropanal



⑧ Propose a Scheme for the Conversion of propan-1-ol to propan-2-ol

Ans: The conversion of propan-1-ol to propan-2-ol involves dehydration and hydrolysis. The propan-1-ol is dehydrated using concentrated H_2SO_4 to produce propene. The propene is then hydrolysed to produce propan-2-ol. It is called Markovnikov's addition.



⑤ Show the reaction between 2-Methylpropanone and butylmagnesium chloride

Ans:

