

① Classification of Alcohol

① 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°). 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 a TERTIARY ALCOHOL (3°). E.g.  $\text{CH}_3\text{OH}$  (1°),  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$  (2°).

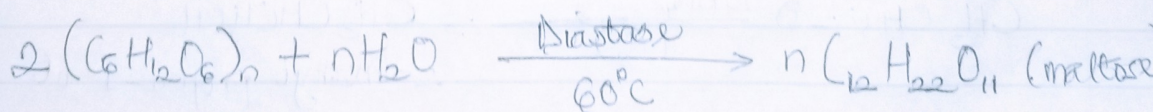
② Based on the number of hydroxyl group they possess: Monohydric alcohol have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called GLYCOLS, which have two hydroxyl groups present in the alcohol structure. Trihydric alcohol have three hydroxyl groups in the alcohol structure. Polyhydric alcohol (polyols) have more than three hydroxyl groups. E.g.  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$  (propanol)

③ Lower alcohol with up to three carbon atoms in their molecules are soluble in water because these lower alcohol can form hydrogen bond with water molecules. The water solubility of alcohol decrease with increase in relative molecular mass. All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols are largely due to their ability to form hydrogen bonds with water molecules.

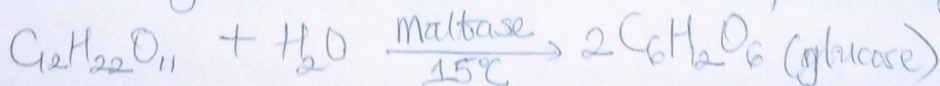
③ INDUSTRIAL MANUFACTURE OF ETHANOL

① Carbohydrates such as starch can be used for the manufacture of ethanol.

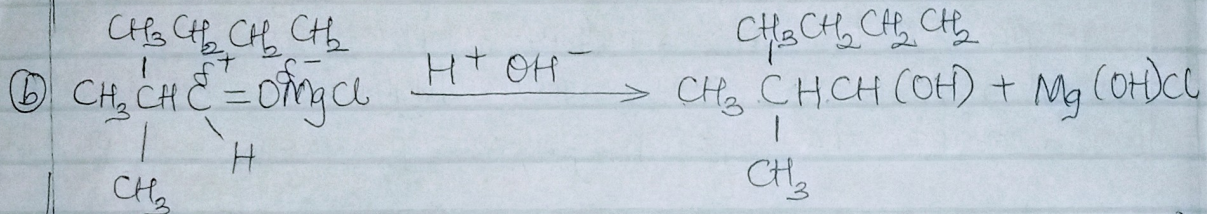
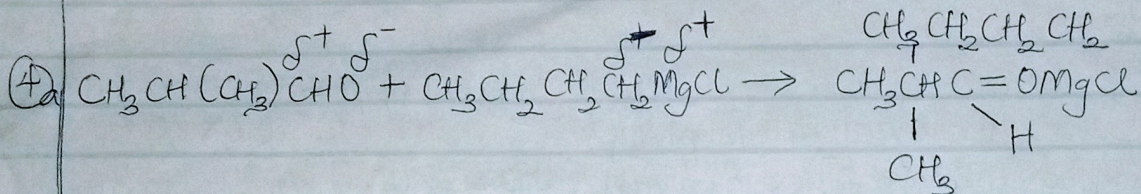
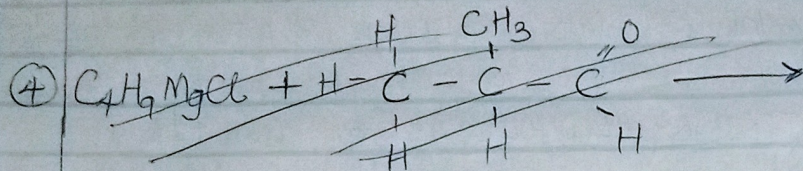
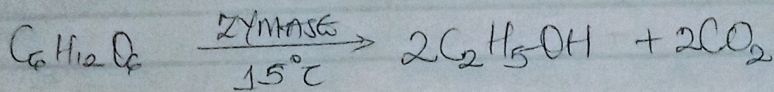
STEP 1: this involves the breakdown of carbohydrates into disaccharides using an enzyme DIASTASE under a temperature of 60°C



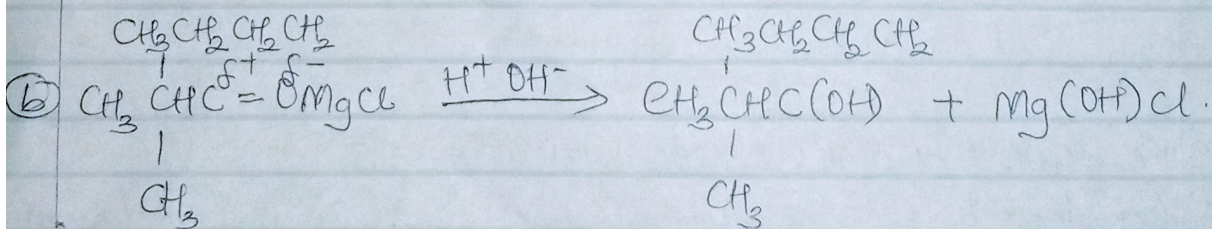
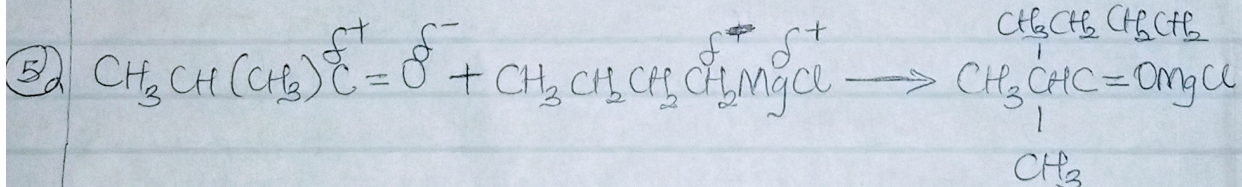
STEP 2: this involves the breakdown of ~~malt~~ disaccharides into monosaccharides using MALTASE (~~KASE~~) under a temperature of 45°C.



STEPS: This involves the conversion of glucose to ethanol using ZYMASE under a temperature of 15°C

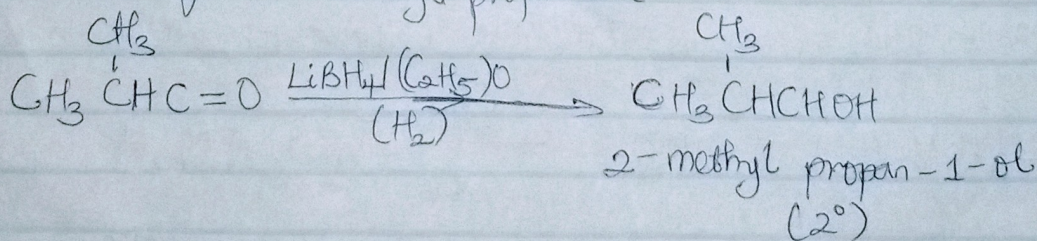


2,2-butyl methyl propan-1-ol (2°)

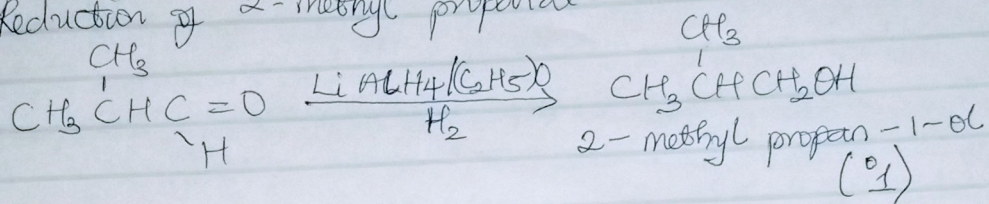


2,2-butyl methyl propanol (3°)

⑥ Reduction of 2-methyl propanone.



⑦ Reduction of 2-methyl propanal.



⑧ Conversion of propan-1-ol to propan-2-ol.

