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COLLEGE: MEDICINE AND HEALTH SCIENCES

DEPARTMENT: MEDICINE AND SURGERY

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1 There are 2 methods of classification of alcohols:

a 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 e.g.  $\text{CH}_3\text{OH}$  (Methanol).

It is called a secondary alcohol if one hydrogen atom is attached to the carbon atom bearing the hydroxyl group e.g.  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$  (Propan-2-ol)

If no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol e.g.  $(\text{CH}_3)_3\text{C-OH}$  (2-methylpropan-2-ol).

b Based on the number of hydroxyl groups they possess:

Monohydric alcohols have one hydroxyl group present in the alcohol structure e.g.  $\text{C}_3\text{H}_7\text{OH}$  (Propanol)

Dihydric alcohols, also known as Glycols, have two hydroxyl groups present in the alcohol structure e.g.  $\text{HOCH}_2\text{CH}_2\text{OH}$  (Ethan-1,2-diol).

Trihydric alcohols or triols have three hydroxyl groups present in the alcohol structure e.g.  $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$  (Propan-1,2,3-triol)

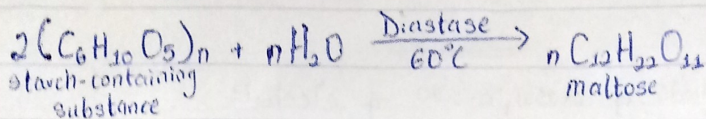
2 Solubility of Alcohols:

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.

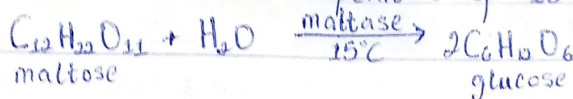
All monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds with water molecules.

3 Steps in the industrial manufacture of ethanol:

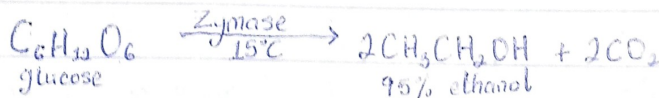
a The starch-containing substance, on warming with malt to  $60^\circ\text{C}$  for a specific period of time, is converted into maltose by enzyme DIASTASE contained in malt.



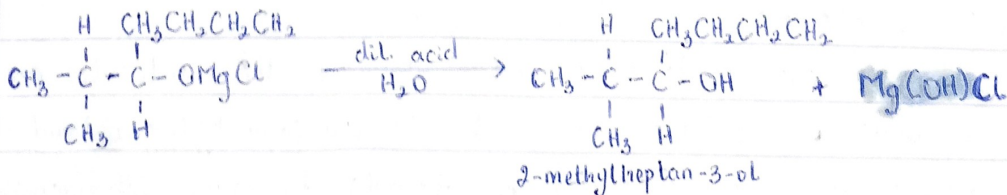
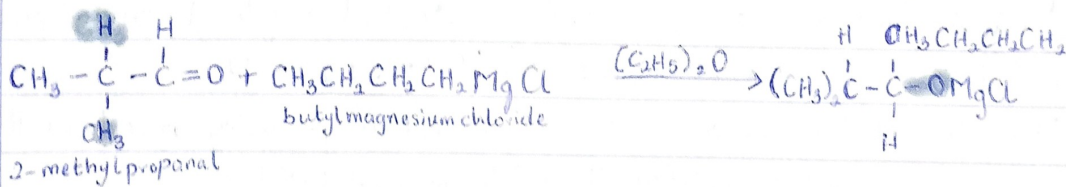
b The maltose is broken down into glucose on addition of yeast which contains the enzyme MALTASE, and at a temperature of  $15^\circ C$ .



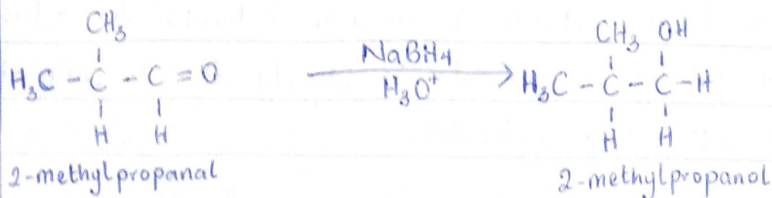
c The glucose, at a constant temperature of  $15^\circ C$ , is then converted into alcohol by the enzyme ZYMASE also contained in yeast.



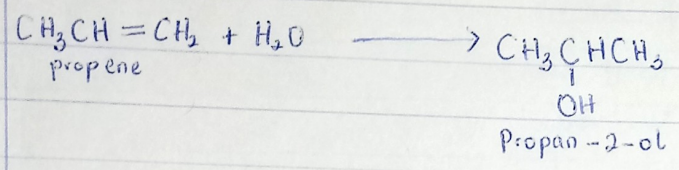
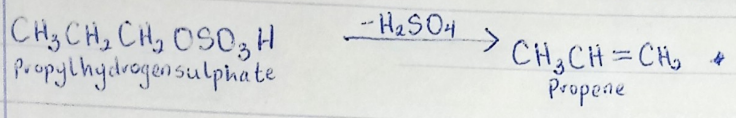
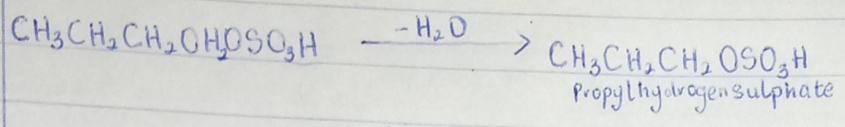
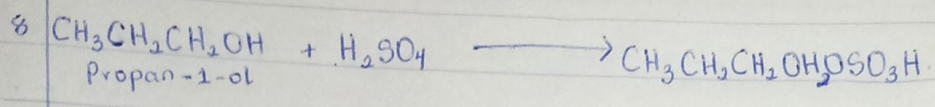
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T/N. Questions 5 and 6 were omitted (as requested by lecturer) as there is no such chemical as 2-methylpropanone