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MEDICINE & SURGERY

CTM 102

1. Classification of alcohols with examples -

A Based on the number of hydrogen atoms attached to the Carbon atom containing the hydroxyl group

Eg

✓ If the Carbon atom has 2 or 3 hydrogen atoms, it is a Primary alcohol e.g.  $\text{CH}_3\text{OH}$ .

✓ If the Carbon atom has 1 hydrogen atom, it is a Secondary alcohol e.g.  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$ .

✓ If the Carbon atom has no hydrogen atom, it is a tertiary alcohol e.g.  $(\text{CH}_3)_3\text{C}-\text{OH}$ .

B Based on the number of hydroxyl group they possess

✓ Monohydric alcohols have 1 hydroxyl group e.g.  $\text{CH}_3\text{CH}_2\text{OH}$

✓ Dihydric alcohols have 2 hydroxyl groups e.g.  $\text{OHCH}_2\text{CH}_2\text{OH}$

✓ Trihydric alcohols have 3 hydroxyl groups e.g.  $\text{C}_6\text{H}_5\text{C}(\text{OH})_3$

✓ Polyhydric alcohols have more than 3 hydroxyl group e.g.  $\text{CH}_3\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}(\text{OH})\text{CH}_3$ .

2. Discuss the solubility of alcohols in Water,  
Organic solvent.

In Water,

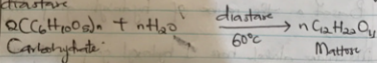
Lower alcohols up to Carbon 3 atoms are soluble in water because they can form hydrogen bond with water molecules.

In Organic solvents.

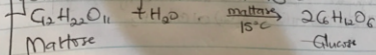
All monohydrate alcohols are soluble in Organic solvent

3. 3 steps in the industrial manufacture of ethanol

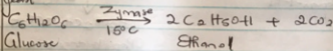
1. The Starch containing material (wheat, corn, potato) is warmed with malt to  $60^{\circ}\text{C}$ . for a period of time, which is converted to maltose with the enzyme diastase



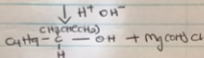
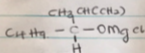
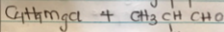
2. The maltose is broken down to glucose by adding yeast containing maltase at  $15^{\circ}\text{C}$



3. The glucose at constant temperature of  $15^{\circ}\text{C}$  is converted to alcohol by zymase also found in yeast.



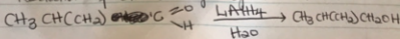
4. Reaction between 2 methyl propanal & butyl magnesium chloride



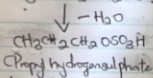
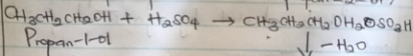
6. Reduction reaction of 2 methyl propanoic X

7. Reduction reaction of 2 methyl propanal

Reduction of an aldehyde gives  $\rightarrow$   $1^{\circ}$  alcohol.



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



dil acid ↓ hydrolysis

