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1. (a) Classification based on the number of hydrogen atom attached to the carbon atom containing the hydroxyl group.

It can be classified into

 i Primary alcohols.

 ii Secondary alcohols.

 iii Tertiary alcohols.

If there are two or three hydrogen atom attached to the carbon atom containing the carboxyl group, it is called primary alcohol if its one hydrogen atom, it is called secondary alcohol and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, its called tertiary alcohol. E.g CH3OH (methanol).

(b) Classification based on the number of hydroxyl group they possess.

This can also be further classified into:

i Monohydric alcohols

ii Dihydric alcohols

iii Trihydric alcohols

iv Polyhydric alcohols

Monohydric alcohols have one hydroxyl group that are present in the structure. Dihydric alcohols which are present in the structure. Dihydric alcohols which are also called glycols have two hydroxyl groups present in the structure. Trihydric alcohols are triols that has three hydroxyl groups present in the alcohols structure. E.g CH3CH(OH)CH2CH(OH)CH2CH3

1. 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 and all monohydric alcohols in organic solvents. The water solubility of alcohols decreases with increasing relative are mandatory.
2. (i) Starch containing materials include molasses, potatoes, cereals, rice, etc.

These starches are broken down on warming with malt to 60oC for a specific period of time and are the converted to maltose by an enzyme called diastase contained in the malt.

60Oc/diastase

2(C6H10O5)n + nH2O nC12H22O11

Carbohydrate Water Maltose

 (ii) The maltose is then broken down into glucose on addition of yeast which contains an enzyme called maltase at temperature of 15.

150Oc/maltase

 C12H22O11 + H2O 2C6H12O6

Maltose Water glucose

 (iii) The glucose is then converted into alcohol at a constant temperature of 15oC in the presence of an enzyme called zymase which is contained in the yeast.

150Oc/maltase

 2C6H12O6 2C2H5OH + 2CO2

Glucose Ethanol carbon

 Dioxide

1. H CH3

O

C

C

H

C + C4H9MgBr

H

H

H

 H CH3  OMgBr H H H H

 H C C C C C C C H

 H H H H H H H

 H+

 Di acid

 H CH3 OH H H H H

H C C C C C C C H + Mg(OH)Br

 H H H H H H H

(7) H CH3  O H H H

 H C C Li ALH4 H C C C OH

 H H H H2O H H H

2methyl propanol 2 methyl proanol

(8) Dehydration of propan-1-ol to propene

a. Dehydration of propan-1-ol is treated with concentrated sulfuric acid (H2SO4) the phenomenom called dehydration occurs due to which a water molecule from propan-1-ol gets eliminated.

Due to this propan-1-ol gets converted into propene. The reaction involved is as follows.

Conc. H2S04

CH3CH2CH2OH CH3CH=CH2

Propene

Propan-1-ol

b. Hydrolysis of propene to propan2-ol.

Propene can be hydrolysed to propan-2-ol in accordance with mechanism called markownikoffs reaction which state that when an unsymmetrical reagent the negative part of the reagent gets attached itself to the carbon atom of the alkene which has less number of hydrogen atoms.

In case, the unsymmetrical reagents used in H2O which is composed of H\* and OH\* part. Due to hydrolysis of water, the negative part attaches itself to the propene and thus converts it as propan-2-ol. The reaction is as follows:

H2O

CH3 CH= CH2 CH3 CH2 OH CH3

**Propan-2-ol**

**Propene**