**PINNICK ITSE ORITSETSERUNDEDE**

**CHEMICAL ENGINEERING**

**19/ENG01/013**

**CHM 102 ASSIGGNMENT**

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 (10 ), If it is one hydrogen atom, it is called secondary alcohol (20) and if there is no hydrogen atom attached to the carbon atom bearing the hydroxyl group, it is called tertiary alcohol.

**Example:** CH3OH Methanol (10)

**Based On The Number Of Hydroxyl Group They Possess:** Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called Glycols; they have two hydroxyl groups present in the alcohol structure while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol. Polyhydric or polyols have

**Example:** HOCH2CH2OH Ethane-1,2-diol (Dihydric Alcohol)

1. Lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can for hydrogen bonds 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.
2. **Production of ethanol:** Carbohydrates such as starch are a major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalyst, 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 and on warming with malt to 650C for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.

**2(C6H10O5)n + nH2O nC12H22O11**

**Carbohydrate 600C/ diastase maltose**

The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase at a temperature of 150C

**C12H22O11 + H2O 2C6H12O6**

**Maltose 150C/ maltase Glucose**

The glucose at constant temperature of 150C is then converted into alcohol by the enzyme Zymase contained also in yeast.

**C6H12O6 2CH3CH2OH + 2CO2**

**Glucose 150C/Zymase ethanol**

1. **H CH3 O H CH3 OMgCl**

**H C C C + C4H9MgCl H C C C C4H9**

**H H H BUTYLMAGNESIUMCHLORIDE H H  H**

**2-METHYLPROPANAL**

Dil. acid

**H+ OH-**

**H CH3 OH**

**Mg(OH)Cl + H C C C C4H9**

**H H H**

1. **H CH3 O H H OH H**

H2(Ni or Pt) Cat.

**H C C C H C C C C H**

Or LiAlH4

**H H H H H H H**

**2-METHYLPROPANAL**

Al2O3

1. **CH3CH2CH2OH CH2=CHCH3**

PROPENE

PROPAN-1-OL

3750C

**CH2=CHCH3 + H2SO4 CH3CH(OSO3H)CH3**

TETROXOSULPHATE(VI) ACID

**H2SO4 + CH3CH(OH)CH3**

PROPAN-2-OL