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**MATRIC NUMER: 19/MHS02/015**

 **LEVEL: 100**

1. **Discuss the two major classification of alkanols. Give two examples for each class**

 Answer

1. **Based** **on** **the number** **of hydrogen** **atoms attached** **to the carbon atom containing the hydroxyl group.**

Having 2 or 3 hydrogens-: primary alcohol

Having 1 hydrogen-: secondary alcohol

Having no hydrogen-: tertiary alcohol

**Example;**

CH3OH-: methanol (primary alkanol)

CH3CH(OH)CH3 -: Propan-2-ol (secondary alkanol)

1. **Based on the number of hydroxyl they possess**

**.** Monohydric alcohol has one hydroxyl group

**.** Dihydric or glycol has two hydroxyl group

**.** Trihydric or triol has three hydroxyl group

**.** Polyhydric alcohol has more than three hydroxyl group

**Example;**

CH3CH2CH2OH-: Propanol (monohydric alcohol)

CH3CH(OH)CH2CH(OH)CH2CH3-: Hexan-2,4-diol (dihydric alcohol)

1. **Reaction between a named** **Grignard reagent with CH3CH2CH2CH2C=OCH2CH2CH3**

 Answer

CH3MgCl +CH3CH2CH2CH2C=OCH2C2CH3

 CH2CH2CH3

 CH3CH2CH2CH2--C--OMgCl H20 =

 CH3 DIL.ACID

 CH2CH2CH3

 CH3CH2CH2CH2--- C---0H + Mg(OH)Cl

 CH3

1. **Industrial preparation of ethanol**

**Step 1**

Carbohydrate such as starch can be made to yield ethanol by the biological process of fermentation. Carbohydrate is warmed with malt to 60 C for a specific period of time and converted into maltose by the enzyme diastase contained in the malt.

2(C6H10O5)n + nH2O----------------🡪nC12H22O11

Carbohydrate 60 C/diastase maltose

**Step 2**

Maltose is broken down into glucose on addition of yeast which contains enzyme maltase and at a temperature of 15 C

C12H22O11 +H2O----------------🡪2C6H12O6

Maltose 15 C/maltase glucose

**Step 3**

The glucose at constant temperature of 15 C is converted into alcohol by the enzyme zymase also contained in yeast.

C6H12O6----------------🡪2CH3CH2OH +2CO2

Glucose 15 C/ zymase ethanol

1. a) Reduction of Alkanal

 RCHO LiAlH4 /(C2H5)2O RCH2OH

 H2+

Alkanal primary alcohol

**Example,**

CH3CHO LiAlH4/(C2H5)2O CH3CH2OH

 H2+

Ethanal ethanol

b) Reduction of alkanone

 R’RC=O LiAlH4/(C2H5)2O R’RCHOH

 H2+

 alkanone Secondary alcohol

**Example;**

(CH3)2 C=O LiAlH4/(C2H5)2O CH3CH(OH)CH3

 H2+

Propanone propan-2-ol