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**MATRIC NO: 19/MHS09/010.**

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QUESTION 1.

A. Classification 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 bearing the hydroxyl group are 2 or 3, It is called a primary alcohol (1°). It is called a secondary alcohol (2°) when one hydrogen is attached to the carbon bearing the hydroxyl group. If no hydrogen is attached to the carbon bearing the hydroxyl group, It is called a tertiary alcohol (3°).

Examples:

CH3CH2OH- Ethanol (1°)

(CH3)3C-OH- 2 methyl-propan-2-ol (3°)

B. Classification based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called Glycols, They have 2 hydroxyl groups present in the alcohol structure. Trihydric/ triols have 3 hydroxyl groups present in the alcohol structure. Polyhydric alcohols have more than 3 hydroxyl groups in the alcohol structure.

Examples:

CH3 CH2CH2OH (Propanol)- Monohydric

CH2OHCH2OH (Ethane 1,2-diol)- Dihydric.

QUESTION 2.

Grignard Reagent: CH3CH2CH2MgCl

CH3CH2CH2MgCl + CH3CH2CH2CH2C=OCH2CH2CH3

CH3CH2CH2CH2 CH3CH2CH2CH2

CH3CH2CH2 C- OMgCl H2OCH3CH2CH2- C- OH + Mg (OH)Cl

CH2CH2CH3 dilute acid CH2CH2CH3

4 propyl octan-4-ol

QUESTION 3.

INDUSTRIAL MANUFACTURE OF ETHANOL.

* Carbohydrate is converted into maltose at a temp of 60°C and by the enzyme diastase.

2(C6H10O5)n  + nH2O nC12H22O6

60°C/diastase maltose

* Maltose is broken down into glucose on addition of yeast which contains the enzyme maltase at 15°C.

C12H22O11  + H2O C6H12O6

15°C/maltaseglucose

* Glucose at constant temperature 15°C is converted into alcohol with enzyme zymase contained also in yeast.

C6H12O6 2CH3CH2OH + CO2

15°C/Zymase Ethanol Carbondioxide.

QUESTION 4

* Reduction of Alkanone gives a secondary alcohol.
* Reduction of Alkanal gives a primary alcohol.

REDUCTION OF ALKANAL

CH3CH2CHO LiAlH4 CH3CH2CH2OH

Propanal H2O Propanol.

REDUCTION OF ALKANONE.

CH3COCH3 LiAlH4 (CH3)2CHOH

Propanone H2O Propan-2-ol.