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MATRIC NO:19/MHS02/053

COURSE CODE:CHM 102

DEPARTMENT:NURSING SCIENCE

1. DISCUSS THE TWO MAJOR CLASSIFICATION OF ALKANOLS.GIVE TWO EXAMPLES EACH FOR EACH CLASS.

 a).. CLASSIFICATION BASED ON THE NUMBER OF HYDROGEN ATOMS: If the number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called a primary alkanol(10). If it is one hydrogen atom , it is called secondary alkanol(20) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol(30)

Examples include:CH3OH{Methanol}

 CH3CH2OH{Ethanol}

b)..CLASSIFICATION BASED ON NUMBER OF HYDROXYL GROUP THEY POSSESS: Monohydric alcohols have one hydroxyl group present in its alcohol structure.Dihydric alcohols are also called Glycols and 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 alcohols or polyols have more than three hydroxyl groups.

Examples:CH3CH2CH2OH{Propanol}

 HOCH2CH2OH{Ethane-1,2-diol}

2.IN THE GRIGNARD SYNTHESIS OF ALKANOLS, REACT A NAMED GRIGNARD REAGENT WITH CH3CH2CH2CH2C=OCH2CH2CH3. SHOW THE REACTION STEPS

Grignard Reagent-C2H5MgBr

CH3CH2CH2CH2-C=OCH2CH2CH3+C2H5MgBr

C3 H9C3H7C2H5-C-OMgBr C4H9C3H7C2H5 -C-OH+Mg(OH)Br

3.DISCUSS THE INDUSTRIAL MANUFACTURE OF ETHANOL SHOWING ALL THE REACTIONS EQUATIONS AND NECESSARY ENZYMES AND TEMPERATURES OF REACTION.

1. The breakdown of carbohydrates

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

 Carbohydrates 600C/Diastase maltose

1. The breakdown of maltose

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

Maltose 150C/ maltase Glucose

1. Conversion of glucose to ethanol

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

Glucose 150C/ Zymase Ethanol

 4) DETERMINE THE PRODUCT OBTAINED IN THE REDUCTION OF ALKANONE AND ALKANAL USE A SPECIFIC EXAMPLE FOR EACH AND SHOW THE EQUATION OF REACTION

 Reduction of an aldehyde leads to a primary alcohol while reduction of a ketone leads to a secondary alcohol

Example

Reduction of an aldehyde

C2H4O +2[H] C2H5OH

Ethanol LiAlH4  Ethanol

Reduction of a Ketone

C3H6O + 2[H] CH3CH(OL)CH3

Propanone LiAlH4 Propan-2-ol