Name: Ifeoluwa Olowookere
Department: Medical laboratory Science
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CHM 102 ASSIGNMENT

1. CLASSIFICATION OF ALCOHOLS

(A) Based on the number of hydrogen atoms attached to the carbon atom containing the hydroxl group; if the Carbon of hydrogen atoms attached to the carbon atom being the hydroxyl group are three or two; it is called a primary alcohol (1°) if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tetiary alchol (3) E.g CH_3CH Methanol (1°), $CH_3CH_3(OH)CH_3$ propan-2-ol (2°) $(CH_3)_3C\text{-}OH$ 2-methyl propenol-2-ol (3°).

(B) Based on the number of hydroxyl groups they process; Monohydric alchols have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called Glycols and have two hydroxyl groups present in the alchols structure while trihydric alchols groups present in the alchols structure while have three hydroxyl group structure of the alchols. Polyhydric alchols or polyols have more than three hydroxyl groups.

E.g $CH_3CH_2CH_2OH$ propanol (Monohydric alchol)
$HOCH_2CH_2OH$ ethane-1,2,-diol (Dihydric alchol)
$OHCH_2CH(OH)CH_2OH$ Propane-1-2-3-triol (Trihydric alchol)

(2) Solubility: Lower alchols with up to three carbon atoms in the molecules are soluble in water because these lower alchols can form hydrogen bond with water molecules The water solubles of alchols decreases with increasing relative molecular mass all monohydric alcohols are suitable in organic solvents the solubility of simple alchols and polyhydric alchols is lagely due

(3) INDUSTRIAL PRODUCTION of ALCOHOLS

(A) Staich containing materials including pmolecules, potatoes etc on warming with malt to 60°C for a specific period of time are converted into maltose by the enzym diastase contained in the malt.

$2(C_6H_{10}O_5)_n + nH_2O \longrightarrow nC_{12}H_{22}O_{11}$

Carbohydrate 60°C / diastase maltose.

The maltose is broken down into glucose of addition of yeast which contains the enzyme maltose and at a temperature of 15°C

(B) $C_{12}H_{22}O_{11} + H_2O \longrightarrow 2C_6H_{12}O_6$

Maltose 15°C / maltose glucose

The glucose at constant temperature of 15°C is the converted into alchol by the enzyme Zymase contained also on yeast

(C) $C_6H_{12}O_6 \longrightarrow 2CH_3CH_2OH + 2CO_2$

Glucose 15% zymase Ethanol.

(4) $CH_3CH(CH_3)H\overset{\delta+}{C}=\overset{\delta-}{O} + CH_3CH_2CH_2CH_2\overset{\delta-}{M}g\overset{\delta+}{Cl}$

$\downarrow$

$CH_2CH_3CH_2CH_3$

$CH_3CH(CH_3)-O-MgCl$

$\downarrow H^+OH^-$

$CH_3CH(CH_3)CH(CH_2CH_2CH_2CH_3) + Mg(OH)Cl$

$CH_3CH(CH_3)C(OH)(CH_2)CH_2CH_3CH_3 + Mg(OH)Cl$

2-Methyl Heptane-3-ol.

(5) Reduction of 2methylpropanal

$CH_3CH(CH_3)HC=O \xrightarrow[LiAlH(C_2H_5)_2O]{} CH_3CH(CH_3)CH_2OH$