7.) $CH_3CH(CH_3)CHO \xrightarrow{LiAlH_4/(C_2H_5)_2O} CH_3CH(CH_3)CH_2OH$

8.) $CH_3CH_2CH_2OH + H_2SO_4 \longrightarrow CH_3CH_2CH_2OH_2OSO_3H$

$\downarrow -H_2O$

$CH_3CH_2CH_2OSO_3H$

$CH_3CH_2CH_2OSO_3H \longrightarrow CH_3CH=CH_2 + H_2SO_4$

$CH_3CH=CH_2 + H_2O \longrightarrow CH_3\underset{\underset{OH}{|}}{CH}CH_3$

NAME:- IKUOMOLA TOMISIN ELIZABETH
MATRIC NO:- 19/SCI05/004
DEPARTMENT:- MICROBIOLOGY
COURSE CODE:- CHM 102

Assignment

1a.) Classification based on Number of Hydrogen atoms attached to the carbon atoms containing hydroxyl group. If the number of hydrogen atoms are three or two, it is considered a primary alcohol and if the number of hydrogen atoms is one, it is considered a secondary alcohol and if no hydrogen atom is attached, it is a tertiary alcohol e.g CH_3OH (primary alcohol), 1° $CH_3CH(OH)CH_3$ (secondary alcohol (2°)), $(CH_3)_3C-OH$ (Tertiary alcohol (3°)).

b) Classification based on the number of hydroxyl groups they possess. If one ~~hydrogen~~ hydroxyl group is present, it is monohydric alcohol. If two hydroxyl groups are present, it is a dihydric alcohol and if it's three hydroxyl groups, it is said to be a trihydric alcohol (triol). Polyhydric alcohols (polyol) have more than three hydroxyl groups.
$CH_3CH_2CH_2OH$ (monohydric), $HOCH_2CH_2OH$ (Dihydric), $OHCH_2CH(OH)CH_2OH$ (trihydric alcohol).

2.) Solubility:- Lower alcohols with up to three carbon atoms in their molecules are soluble in water because they form hydrogen bond. The solubility of alcohols in water decreases with increasing relative molecular mass. All ~~water~~ monohydric alcohols are soluble in organic solvents.

3.) The material containing starch is warmed with malt to 60°C for a period of time and converted into maltose by the enzyme (Diastase) contained in the malt.

$$2(C_6H_{12}O_5)_n + nH_2O \xrightarrow[60^\circ C]{\text{Diastase}} nC_{12}H_{22}O_{11}$$

carbohydrate → maltose

b) The maltose is broken down into a glucose on addition of yeast which contains the enzyme (maltase) at a temperature of 15°C.

$$C_{12}H_{22}O_{11} + H_2O \xrightarrow[15^\circ C]{\text{maltase}} 2C_6H_{12}O_6$$

maltose → glucose

c) The glucose at a constant temperature of 15°C is then converted into alcohol by the enzyme (Zymase) also in yeast.

$$C_6H_{12}O_6 \xrightarrow[15^\circ C]{\text{Zymase}} 2CH_3CH_2OH_{(l)} + 2CO_{2(g)}$$

Glucose → Ethanol

4.) $CH_3CH(CH_3)CHO + C_4H_9MgCl \xrightarrow{(C_2H_5)_2O} CH_3CH(CH_3)-\underset{\underset{H}{|}}{\overset{\overset{C_4H_9}{|}}{C}}-OMgCl$

$$\xrightarrow[\text{dil acid}]{H_2O} CH_3CH(CH_3)-\underset{\underset{H}{|}}{\overset{\overset{C_4H_9}{|}}{C}}-OH + MgClOH$$