NAME – ADAGUNODO JUMOKE GLORY

DEPT – AGRICULTURAL SCIENCE // COLLEGE OF SCIENCE

MATRIC NO – 19/SCI07/001

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1.

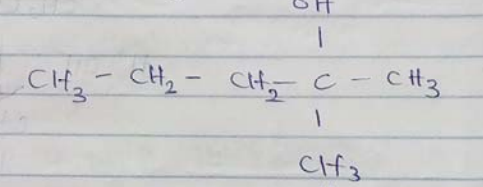
Alkanols are mainly classified in two ways:

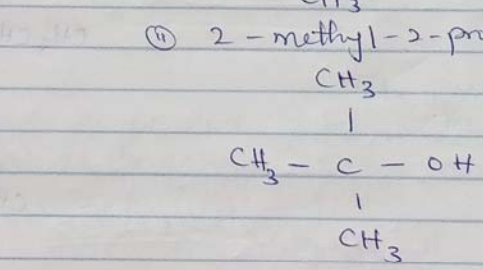
(A) Classification based on the number of alkyl group or hydrogen alone

Alkanols have a general formula "R-OH" where "R" represents the alkyl group e.g Methyl CH_3, Ethyl CH_3CH_2, etc. while "-OH" is the hydroxyl group which is the main functional group for alkanols. There are examples of this classification is:

① Primary Alkanol e.g Ethanol CH_3CH_2OH, Methanol CH_3OH

② Tertiary Alkanol e.g 2-methylbutan-2-ol





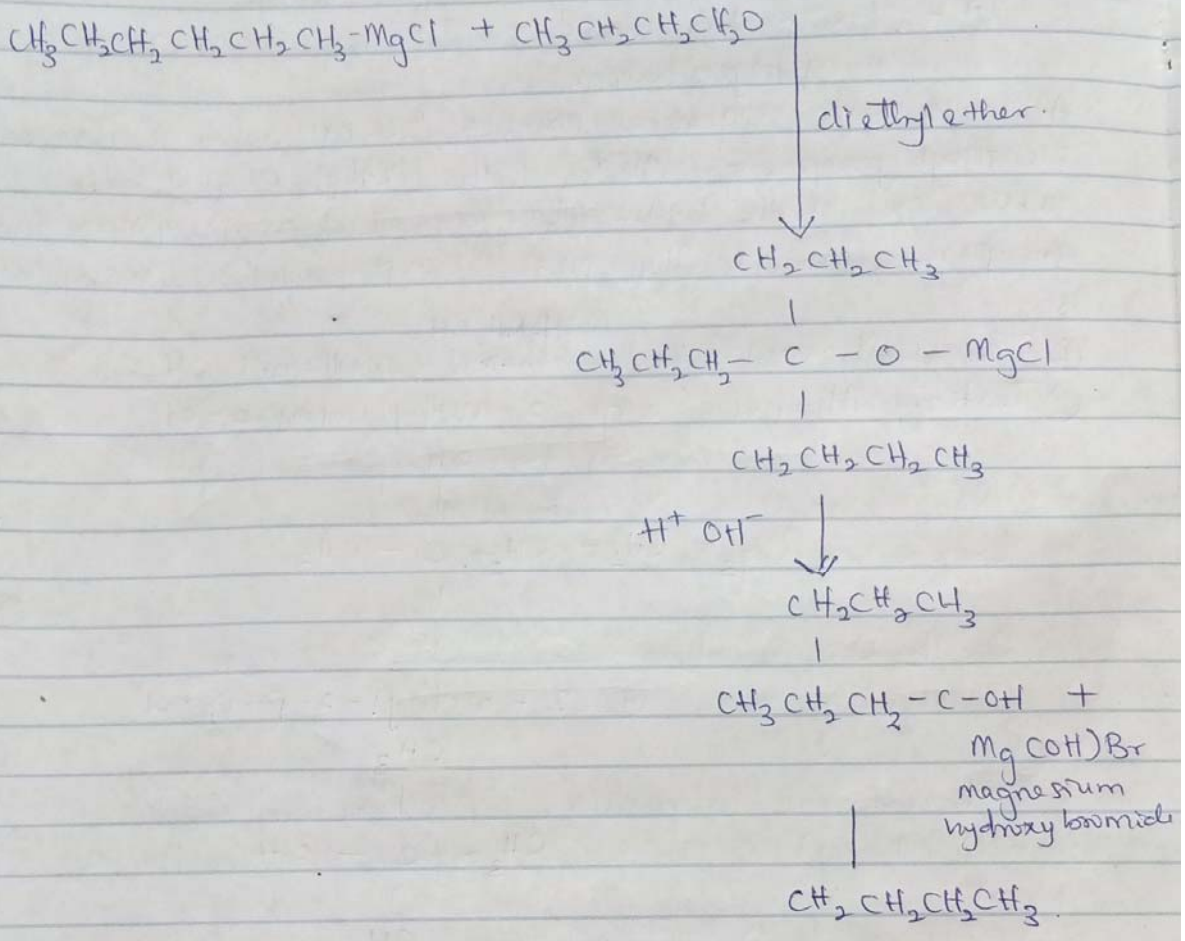
(B) Classification based on the number of hydroxyl group Example of classifications based on this are listed below

(1) – Dihydric Alkanols E.g

2.

$CH_3CH_2CH_2MgCl + CH_3CH_2CH_2CH_2C=OCH_2CH_3$

Propyl magnesium chloride — octan-4-none.



INDUSTRIAL MANUFACTURE OF ETHANOL.

Ethanol are produced industrially when carbohydrates such as starch are made to yield ethanal by the biological process called fermentation. The biological catalysts, enzymes found in yeast breakdown the carbohydrate molecule into ethanol to give a yield of 95%. The starch containing materials include mollases, potatoes, cereals, etc and on warming with malt to 60°c for a specific period of time are converted in maltose by the enzyme diastase contained in malt.

$$2(C_6H_{10}O_5)_n + nH_2O \xrightarrow{60^\circ c \,/\, \text{diastase}} n\,C_{12}H_{22}O_{11}$$

Carbohydrate water. maltose

Hence, the maltose is broken down into glucose on addition to yeast which contains the enzyme maltase and at a temperature of 15°c

$$C_{12}H_{22}O_{11} + H_2O \xrightarrow{15^\circ c \,/\, \text{maltase}} 2\,C_6H_{12}O_6$$

Maltose Glucose

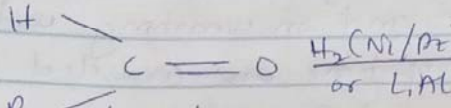
At constant temperature of 15°c, the glucose in yeast is the converted into alcohol (ethanol) by the enzyme zymase contained also in yeast.

$$C_6H_{12}O_6 \xrightarrow{15^\circ c \,/\, \text{zymase}} 2CH_3CH_2OH + 2CO_2$$

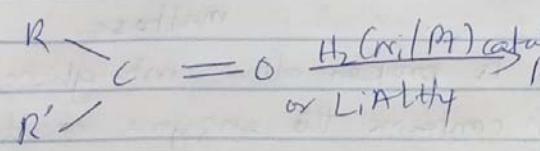
Ethanol

Alkanals and Alkanones are reduced to primary and secondary Alkanols respectively by reaction with hydrogen in the presence of a platinum or nickel catalyst or with aluminium isopropoxide (Meerwein-Ponndorff reaction) or with complex metal hydride. E.g $LiAlH_4$ or $NaBH_4$.

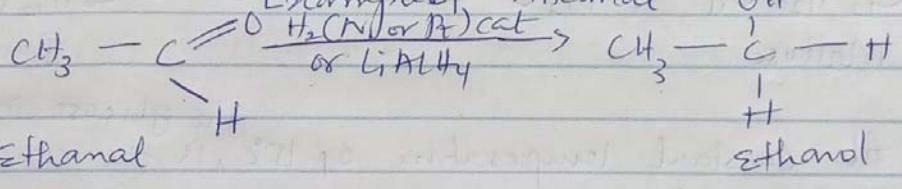
Alkanals



Alkanones



Example of Alkanal



Example of Alkanone