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Elect / Elect Engineering
19/ENG04/1004

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CHM 102

(1.) Classification of Alcohols

① Hydrogen atoms attached to the carbon atoms containing the hydroxyl groups. If the numbers of hydrogen atoms attached to the carbon are 2 or 3 they are called primary alcohols, one hydrogen atom attached is called secondary alcohol and no hydrogen atom is called tertiary. eg, CH_3OH (1^0) primary alcohol; CH_3CH_2OH (1^0) primary alcohol.

② Classification based on the number of hydroxyl groups they possess. One -OH group is monohydric alcohol; 2 hydroxyl groups is called dihydric alcohol aka glycol; Triol or Trihydric are 3 hydroxyl groups and Polyols or Polyhydric are more than 3 -OH groups.

eg, $OHCH_2CH_2OH$; Ethan-1,2-diol & dihydric alcohol

$CH_3CH_2CH_2OH$ Ropan-1-ol monohydric alcohol.

(2.) Solubility of Alcohol

① Water : Alcohols with up to 3 carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. the water solubility of alcohols decreases with increasing relative molecular mass.

② Organic Solvents : All monohydric alcohols are are soluble in organic solvents. the solubility of simple alcohols and polyols is largely due to their ability to form hydrogen bonds with water molecules.

(3.) 3 Steps in industrial manufacturing of ethanol.

① Starch containing materials like cereals, potatoes, etc are warmed with malt to 60°c and converted to maltose by enzyme diastase.

$$2(C_6H_{10}O_5)_n + nH_2O \xrightarrow{60°C/\text{diastase}} nC_{12}H_{22}O_{11}$$

carbohydrate → maltose

(ii) Maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15°C

$$C_{12}H_{22}O_{11} + nH_2O \xrightarrow{15^\circ C \,/\, \text{Maltase}} 2C_6H_{12}O_6$$

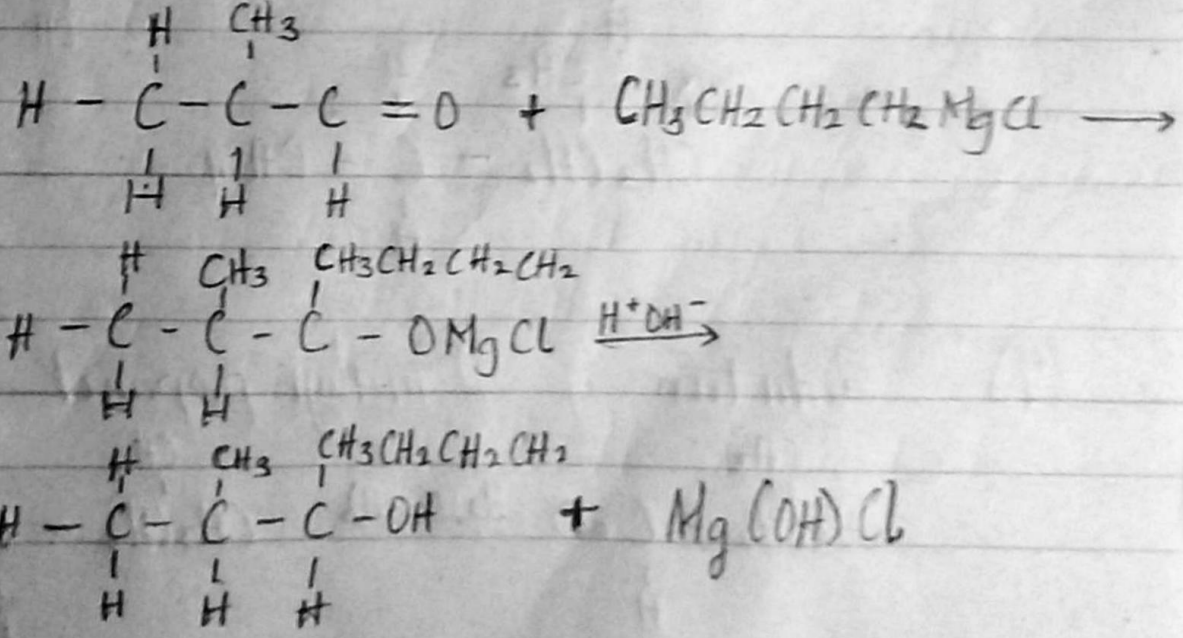
Maltose

(iii) Glucose at constant temperature of 15°C is then converted into alcohol by enzyme zymase contained also in yeast

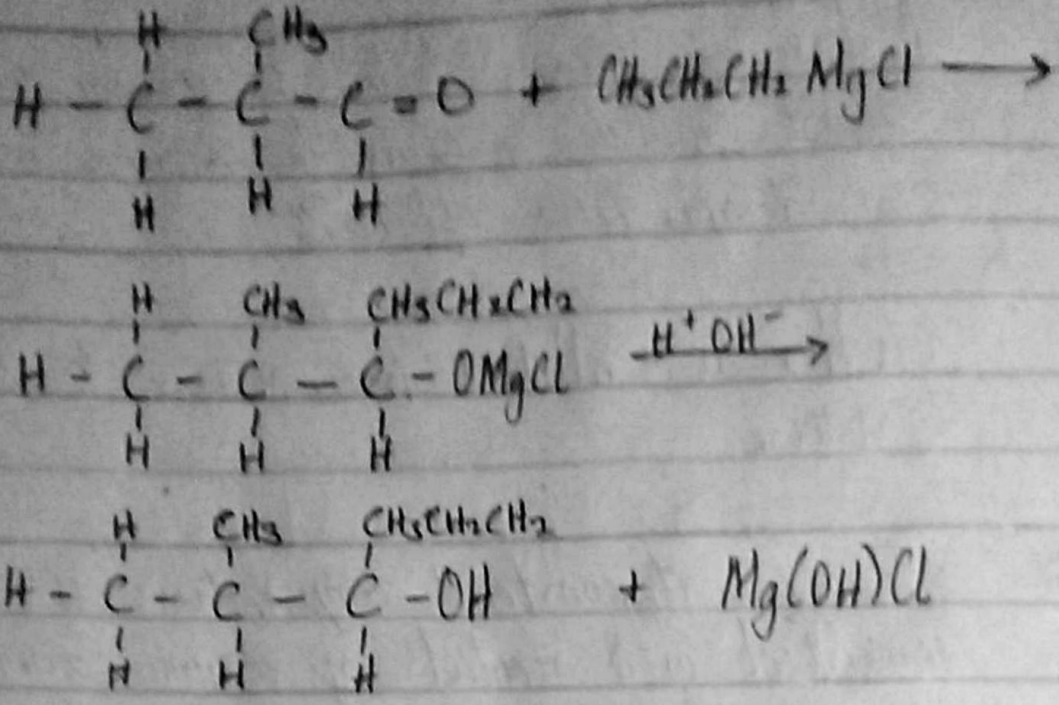
$$C_6H_{12}O_6 \xrightarrow{15^\circ C \,/\, \text{zymase}} 2CH_3CH_2OH + 2CO_2$$

Glucose

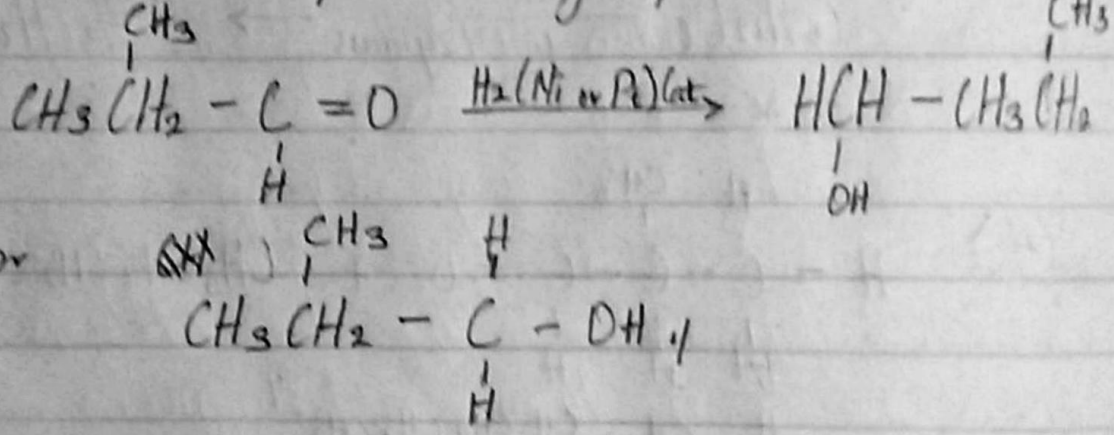
(4.)



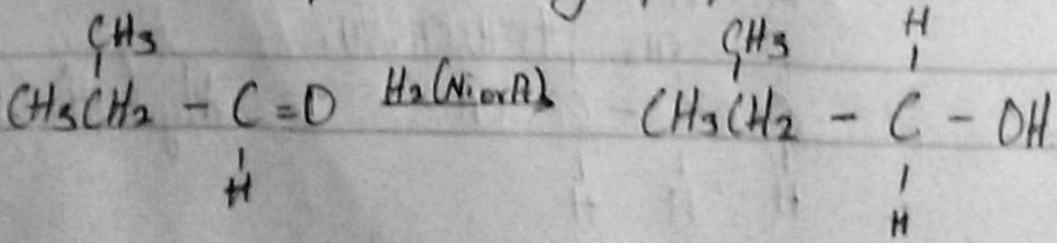
(5.)



(6.) Reduction of 2 methyl pronanone



(7.) Reduction of 2 methyl propanol



(8.) For propan-1-ol to propan-2-ol conversion to occur I propose dehydration.