IFEANYI-OBI ADAEZE CLARE
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1) The major classifications include;

a) This is based on the number of hydrogen atoms attached to the Carbon atom containing the hydroxl group. If the numbers of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called a primary alcohol (1°). If it is one hydrogen atom, it is called secondary alcohol (2°) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol (3°).

Examples are

CH_3OH Methanol (1°), $CH_3CH(OH)CH_3$ Propan-2-ol (2°), $(CH_3)_3C-OH$ 2-Methylpropan-2-ol (3°).

b) This is based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohols are also called Glycols 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 are $CH_3CH_2CH_2OH$ Propanol (Monohydric alcohol)

$HOCH_2CH_2OH$ Ethane-1,2-diol (Dihydric alcohol)

$OHCH_2CH(OH)CH_2OH$ Propane-1,2,3-triol (Trihydric alcohol)

2) Reaction of a grignard reagent to $CH_3CH_2CH_2CH_2C=OCH_2CH_2CH_3$.

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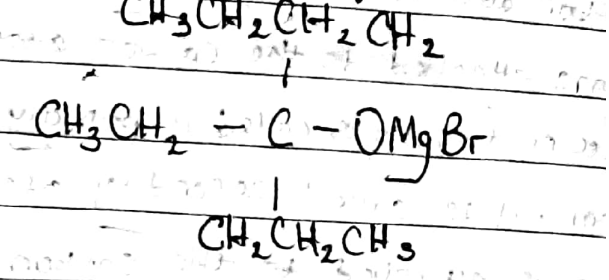
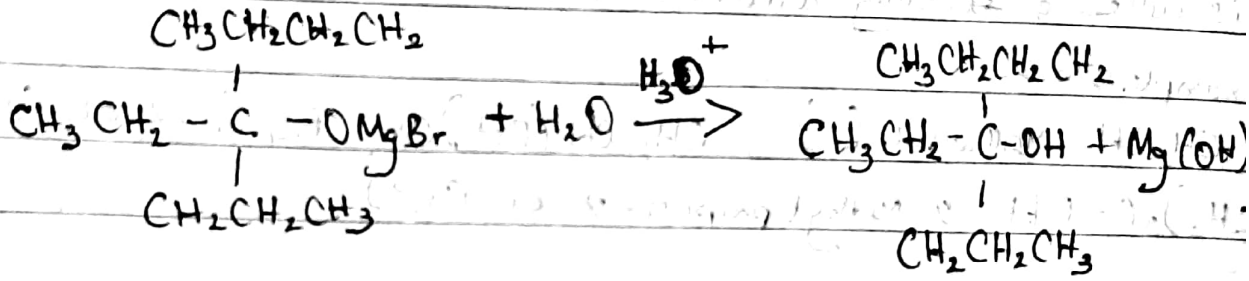
a) $CH_3CH_2MgBr + CH_3CH_2CH_2CH_2C=OCH_2CH_2CH_3 \longrightarrow$

b) Grignard reagent



b)



3) The industrial preparation of Ethanol through Fermentation

a) step 1: The starch containing materials including molasses, potatoes, cereals, rice are warmed with malt to 60°C for a specific period of time and are converted into 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 → maltose

b) step 2: The maltose is broken down into glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15°C.

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

maltose → glucose

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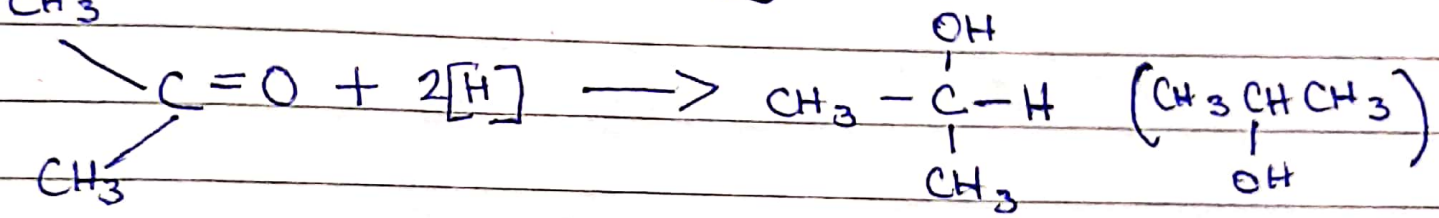
c) Step 3: The glucose at constant temperature of 15°C is then converted into alcohol by the enzyme zymase contained also in yeast.

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

Glucose — 15°C / zymase — Ethanol.

4)a) Reduction of Alkanone

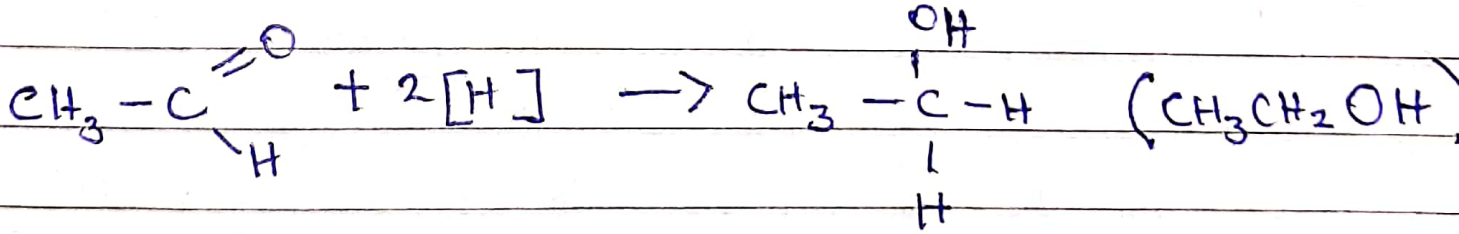
For example, with propanone you get propan-2-ol:



=> Reduction of an alkanone leads to the production of a secondary alcohol.

b) Reduction of an Alkanal.

Using the substance ethanal.



=> Reduction of an alkanal leads to the production of a primary alcohol.