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1 There are two major classes of alkanols, namely:

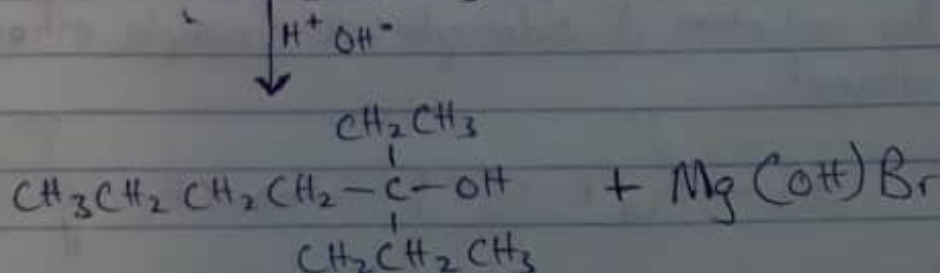
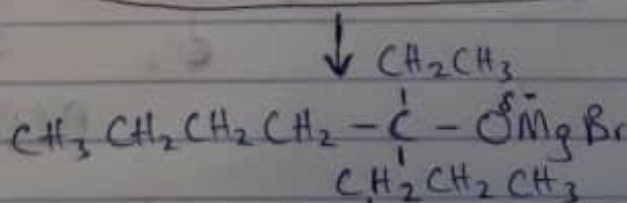
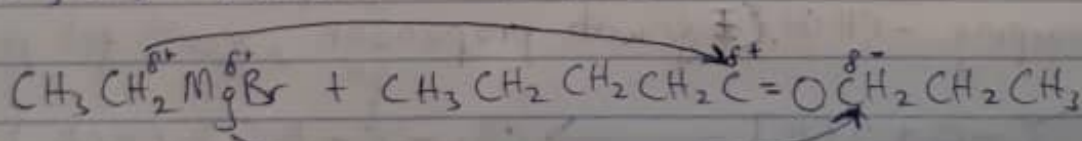
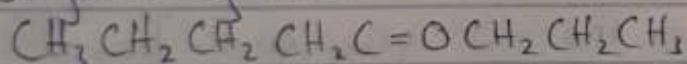
a. Primary Alcohols; In primary (1°) alcohol, the carbon atom that carries the $-OH$ group is only attached to one alkyl group.

Example: Ethanol (CH_3CH_2OH) \rightarrow $\begin{array}{c} H & H \\ | & | \\ H-C & -C-OH \\ | & | \\ H & H \end{array}$. There is only

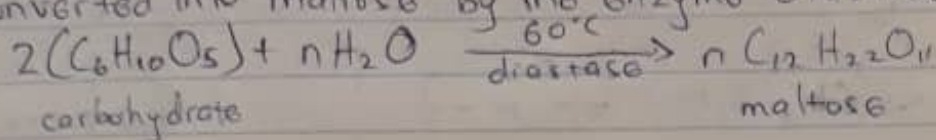
one linkage to an alkyl group from the CH_2 holding the $-OH$ group. The exception to this is methanol (CH_3OH). It is counted as a primary alcohol though there are no alkyl groups attached to the $-OH$ carbon atom. Another example is propan-1-ol.

b. Secondary Alcohols; In a secondary alcohol (2°), the carbon atom with the $-OH$ group attached is joined directly to two alkyl groups which may be the same or different. Examples include: propan-2-ol ($CH_3CH(OH)CH_3$) and butan-2-ol ($CH_3CH(OH)CH_2CH_3$).

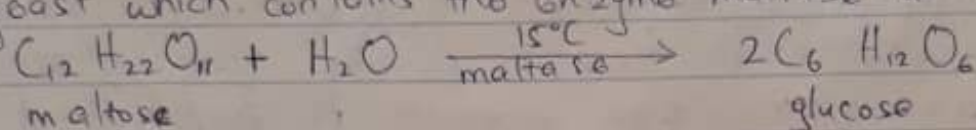
2 Grignard Synthesis



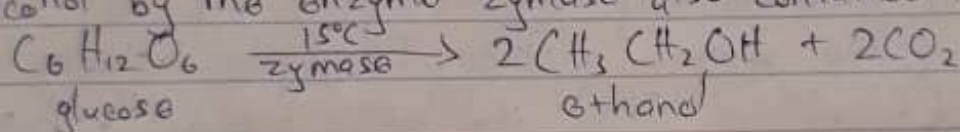
3. Carbohydrates such as starch are a major group of natural compounds that can be made to yield ethanol by ^{the} biological process of fermentation. The starch containing materials such as cereals, rice, etc on ^{warming} heating with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.



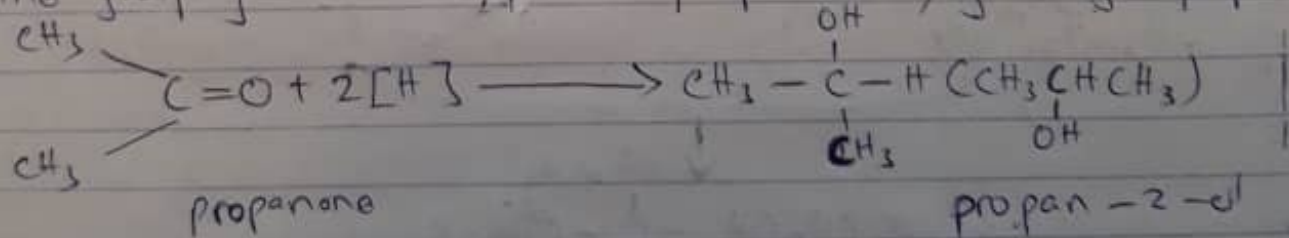
The maltose is further broken down into glucose on addition of yeast which contains the enzyme maltase at 15°C.



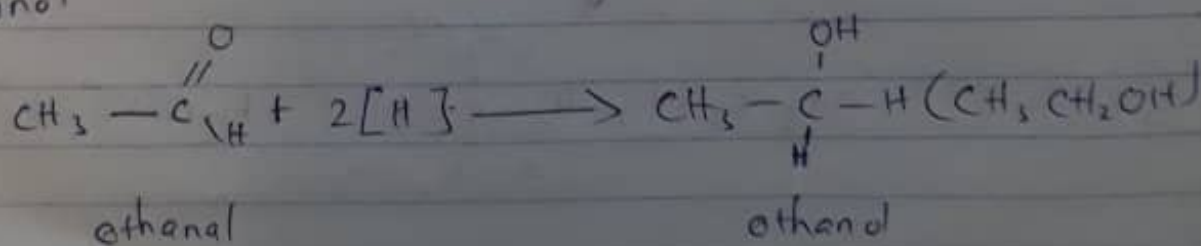
The glucose at constant temperature of 15°C is then converted into alcohol by the enzyme zymase also contained in yeast.



4. Reduction of alkanones (also known as ketones) leads to a secondary alcohol. A secondary alcohol is an alcohol which has two alkyl groups attached to the carbon with the -OH group on it. They all contain the grouping -CH(OH)-. Example with propanone, you'll get propan-2-ol



The reduction of aldehyde: for example, ethanal when reduced gives ethanol



The hydrogen in brackets mean "hydrogen from reducing agent".
In general terms, the reduction of aldehyde leads to a primary alcohol. A primary alcohol ^{is an} ~~that~~ alcohol that has one alkyl group attached to the carbon with the $-OH$ group on it. They all contain the $-CH_2OH$ group.