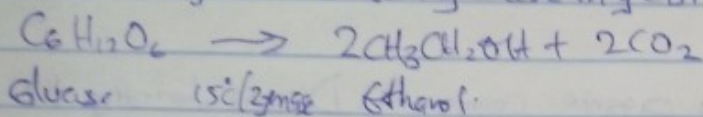
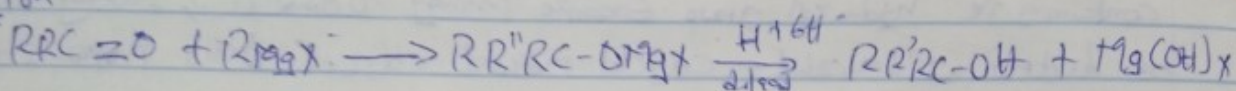


The glucose at constant temperature of  $15^{\circ}\text{C}$  is then converted into alcohol by the enzyme zymase containing also in yeast:

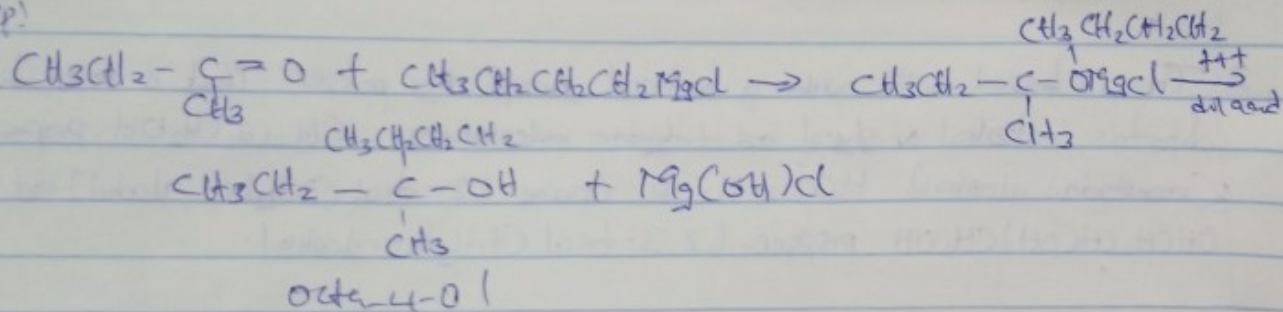


Show the reaction between 2-methylpropanal and lithiummagnesium chloride; Grignard's reagent.

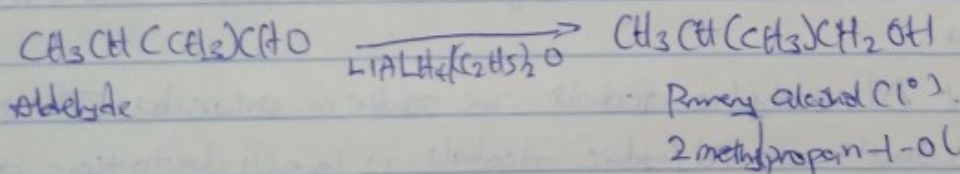
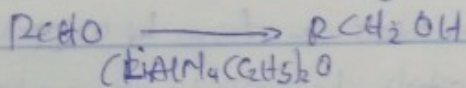
Solution



Step:

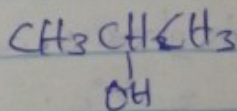
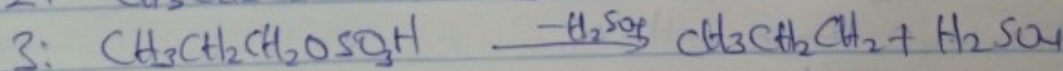
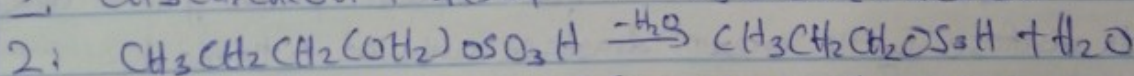
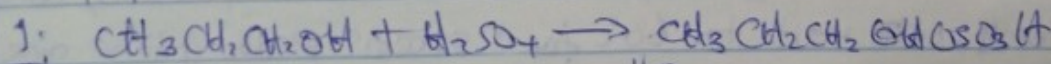
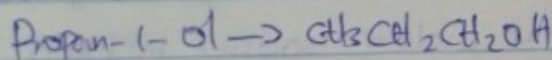


7 Show the reduction reaction of 2-methylpropanal



8 Propose a scheme for the conversion of Propan-1-ol to Propan-2-ol

Solution





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Date: 15th May 2020

Chemistry Assignment

1. Alcohols are very important organic compounds. Discuss briefly their classification and give an example each.

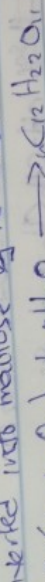
Ans: This is based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. Example primary alcohol (1°), secondary alcohol (2°) and tertiary (3°) alcohol -  $\text{C}_2\text{H}_5\text{OH}$  methanol,  $\text{C}_2\text{H}_5\text{CH}_2\text{OH}$  ethanol,  $\text{C}_2\text{H}_5\text{C}(\text{OH})_2\text{CH}_3$  propan-2-ol (2°) and methylpropanol-2-ol (3°)

2. This is based on the number of hydroxyl groups they possess. That is monohydric (1°), dihydric, alcohol or glycol and trihydric alcohols.  $\text{C}_2\text{H}_5\text{OH}$ ,  $\text{C}_2\text{H}_4\text{OH}$ , propanol (monohydric alcohol),  $\text{HOCH}_2\text{CH}_2\text{OH}$  ethane-1,2-diol (polyhydric alcohol) and  $\text{C}_2\text{H}_4(\text{OH})_2$  propane-1,2,3-triol (trihydric alcohol).

3. Discuss the solubility of alcohols in water, organic solvents and their solubility in water. However, alcohols with up to three carbon atoms in their molecules are soluble in water because their lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with a relative molecular mass.

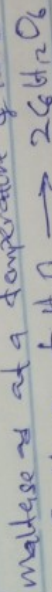
Organic Solvent: All monohydric alcohols are soluble in solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bond with water molecules.

3. Show the three steps in the industrial manufacture of ethanol. Equations of reaction are mandatory. The starch containing materials include molasses potatoes, cereals, rice and on warming with malt at  $60^\circ\text{C}$  for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.



Carbohydrate      Carbohydrate  
maltose                      maltose

The maltose is broken down into glucose on addition of yeast which contains the enzyme



$\text{C}_{12}\text{H}_{22}\text{O}_{11} + \text{H}_2\text{O} \rightarrow 2\text{C}_6\text{H}_{12}\text{O}_6$   
maltose                      glucose