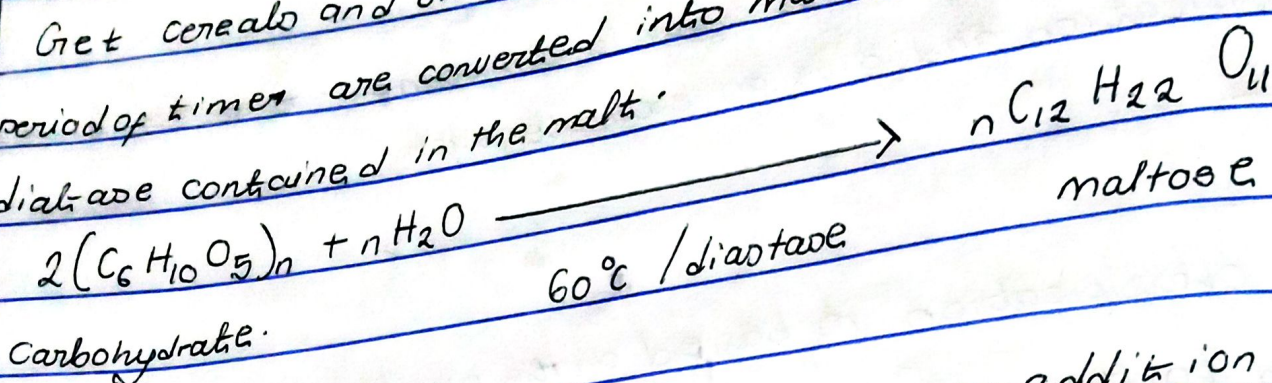


3 Show the three steps in the industrial manufacture of ethanol. Equations of reaction are mandatory.

Answer.

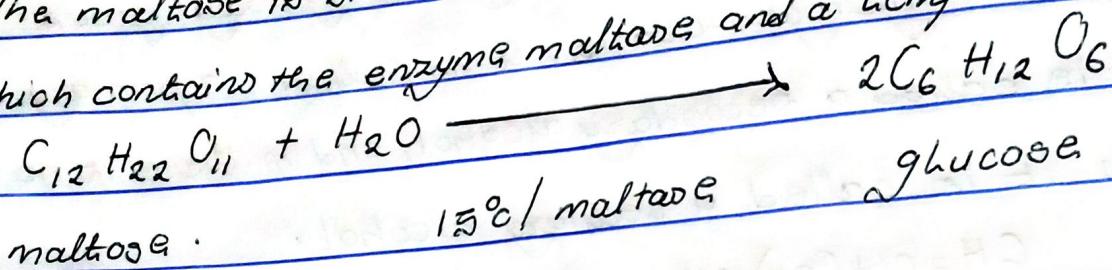
Step 1

Grain cereals and on warming with malt to 60°C for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.



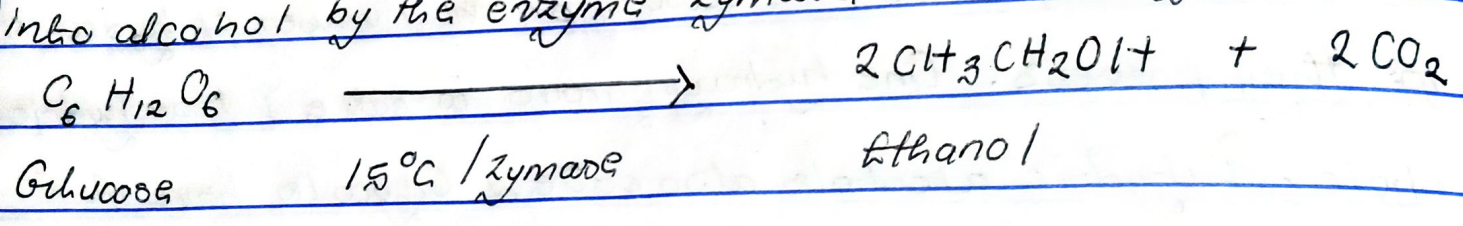
Step 2

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



Step 3

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



Show the reaction between 2-methylpropanal and butyl magnesium chloride.