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COURSE: CHM102

DEPARTMENT: MBBS

DATE: 15th MAY 2020

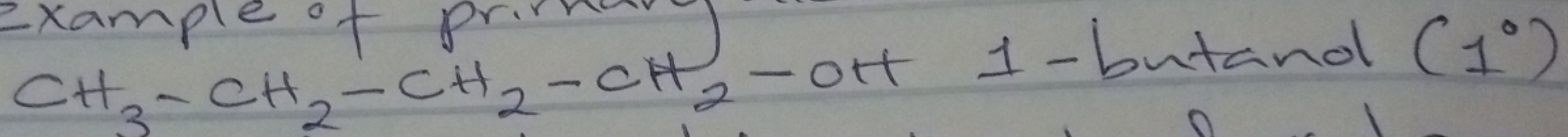
MATRIC NUMBER: 19/mthsol/148

ANSWERS TO ASSIGNMENT

1. Based on which carbon atom is bonded to the hydroxyl group.

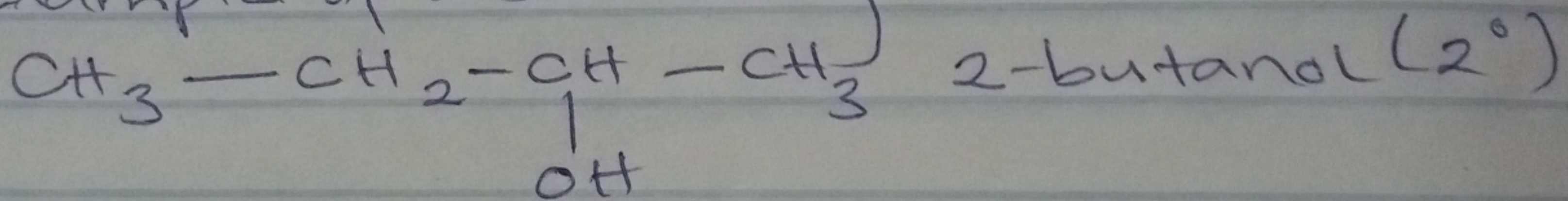
A primary alcohol (e.g. 1-butanol) has the hydroxyl group on a primary (1°) carbon atom which is bonded to only one other carbon atom.

Example of primary alcohol:



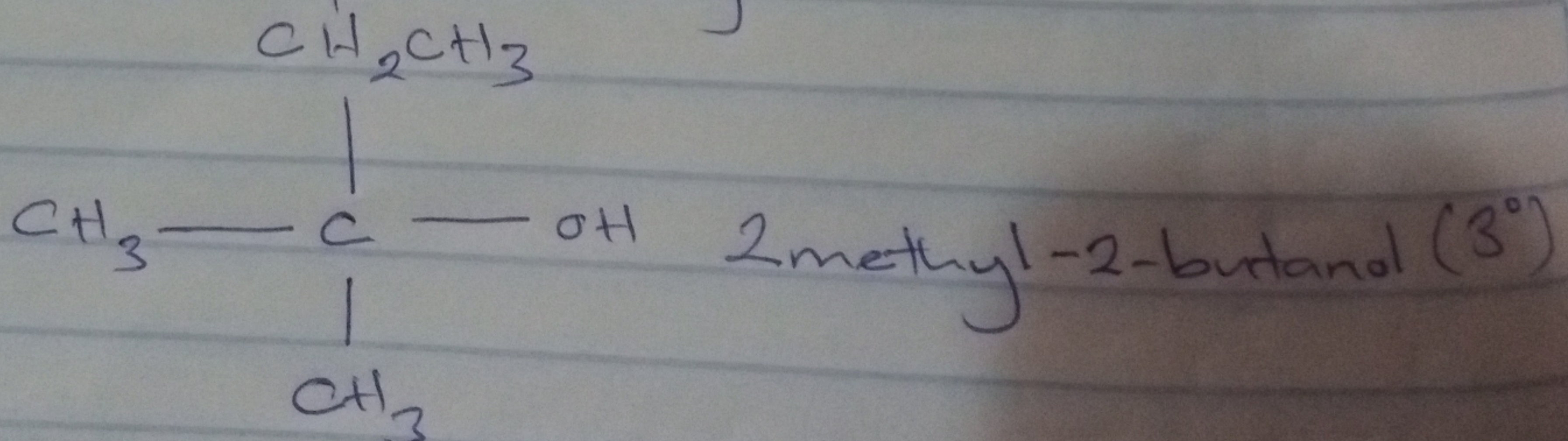
A secondary alcohol has the hydroxyl group on a secondary carbon atom which is bonded to two other carbon atoms.

Example of a secondary alcohol.



A tertiary alcohol has the hydroxyl group on a tertiary (3°) carbon atom which is bonded to three other carbons.

Example of a tertiary alcohol.



2. SOLUBILITY OF ALCOHOLS

A In water

Alcohols are soluble in water. This is due to the hydroxyl group in the alcohol which is able to form hydrogen bonds with water molecules. Alcohols with a smaller hydrocarbon chain are very soluble as the length of the hydrocarbon chain increases, the solubility in water decreases. With four carbon in the hydrocarbon chain and higher the decrease in solubility becomes visible as the mixture forms two layers of immiscible layers of liquid. The reason why the solubility decreases as the length of hydrocarbon increases is because it requires more energy to overcome the hydrogen bonds between the alcohol molecules as the molecules are more tightly packed together as the size and mass increases.

B In organic solvents.

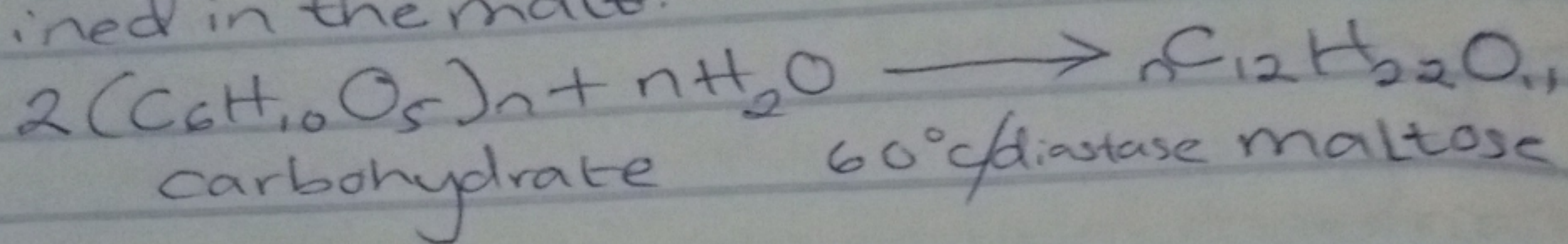
Higher alcohols are fairly soluble in organic solvents. Hexane is nonpolar, and nonpolar ^{Solutes} ~~solvents~~ are soluble in nonpolar solvents. Alcohol having long hydrocarbon chains are miscible with hexane as they can make firm attachment.

3 INDUSTRIAL MANUFACTURE OF ETHANOL

Carbohydrates such as starch are major groups of natural compounds that can be made to yield ethanol by the biological process of fermentation.

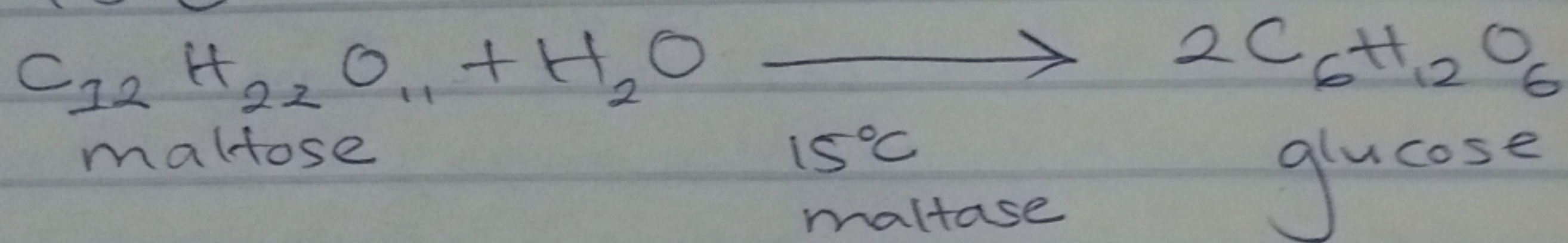
The biological catalysts, enzymes, found in yeast ~~break~~ break down the carbohydrate molecules into ethanol to give a

yield at 95%. The starch containing materials include molasses, potatoes, cereals, rice and on warming with malt at 60°C for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.



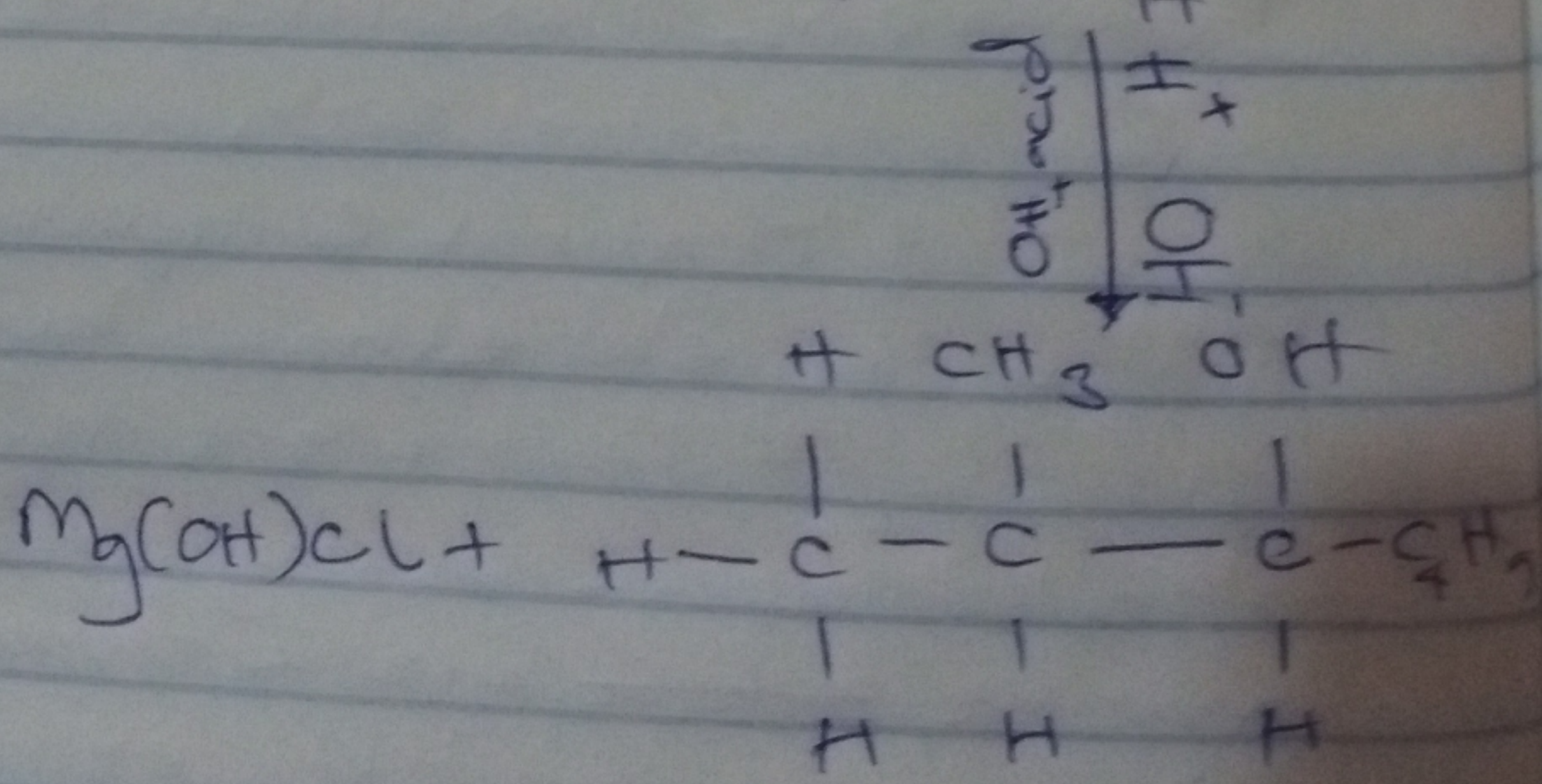
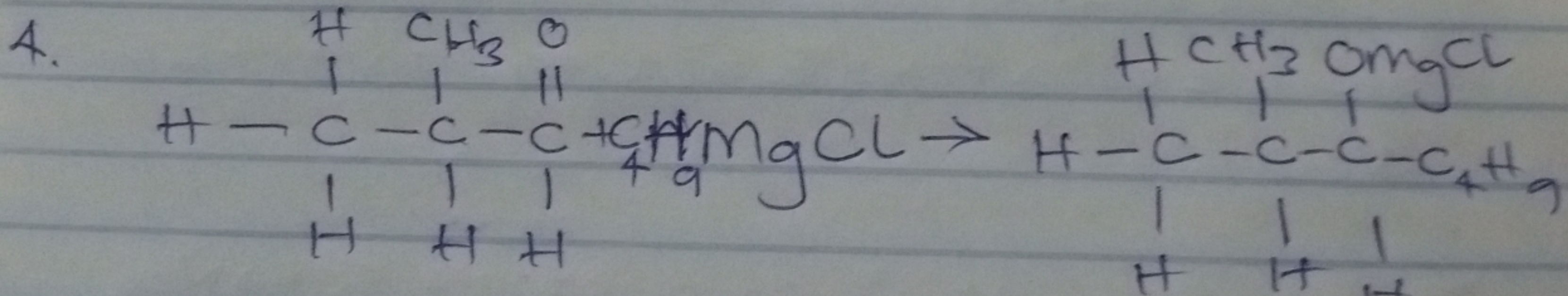
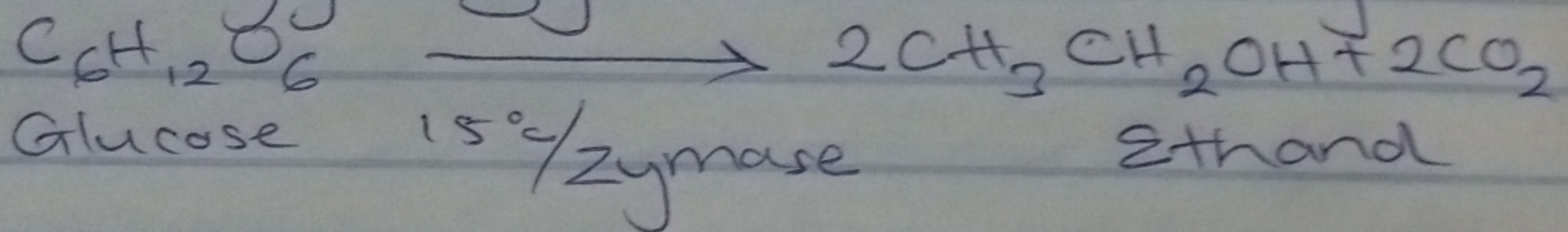
STEP II

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

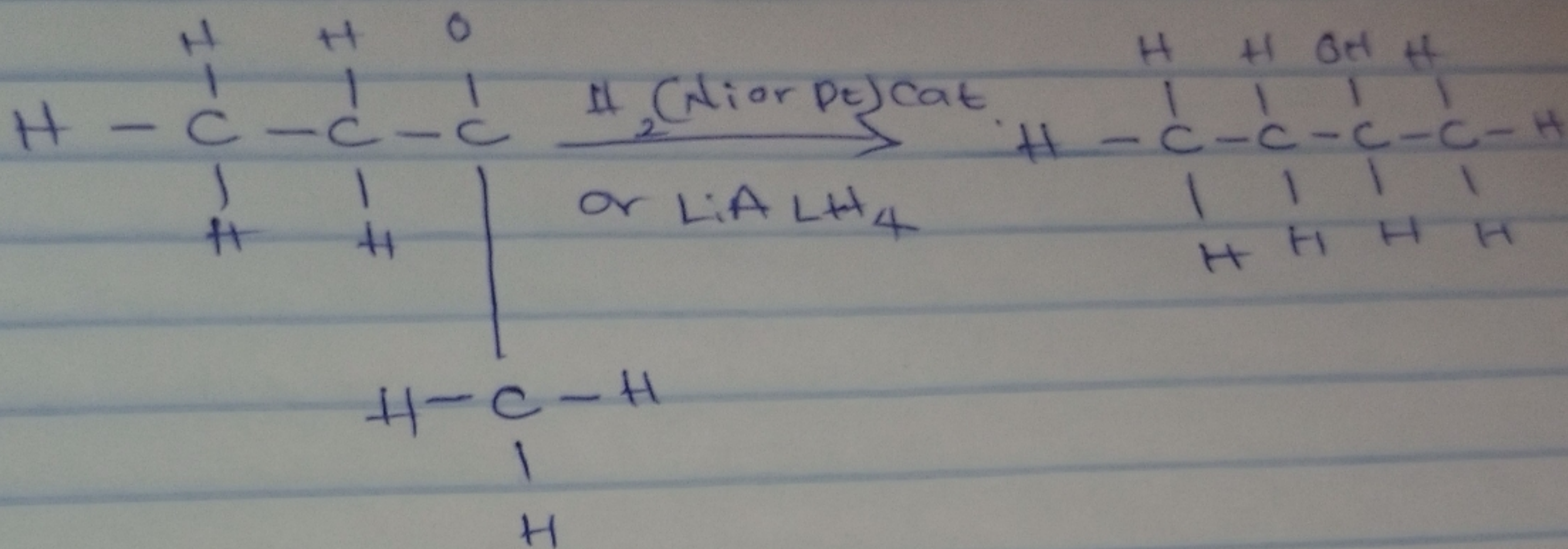


STEP III

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



7.



2-methylpropanal

