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MATRIC NUMBER: 19/MHS01/049

DEPARTMENT: MEDICINE AND SURGERY

CHEMISTRY ASSIGNMENT

1. (a) This is based on the number of hydrogen atoms attached to the carbon atom containing the hydroxyl group. If the numbers of hydrogen atoms attached to the carbon atom containing the hydroxyl group are two or three, it is called a primary alcohol. If the number of hydrogen atom is 1, it is called a secondary alcohol and if none, it is called a tertiary alcohol. E.g. CH3OH – Methanol (primary alcohol)

(b) This is based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group; dihydric alcohols (glycols) have 2 hydroxyl groups and trihydric alcohols (triols) have 3 hydroxyl groups present in the alcoholic structure. E.g. CH3CH2CH2OH – Propanol (Monohydric alcohol)

1. Solubility of alcohol in water, an organic solvent: Lower alcohols with up to three carbon atoms in their molecules are soluble in water because they can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass and all monohydric alcohols are soluble in organic solvents. The solubility of simple alcohols and polyhydric alcohols is largely due to their ability to form hydrogen bonds.
2. Industrial manufacture of ethanol: Carbohydrates are natural compounds that can yield ethanol by the biological process of fermentation. The biological catalysts found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%.

* The starch containing materials include potatoes, cereals, rice and on warming with malt to 600C for a specific period of time are converted into maltose by the enzyme diastase contained in the malt.

2(C6H10O5) n + nH2­O nC12H22O11

Carbohydrate 600C/diastase maltose

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

C12H22O11 + H2O 2C6H12O6

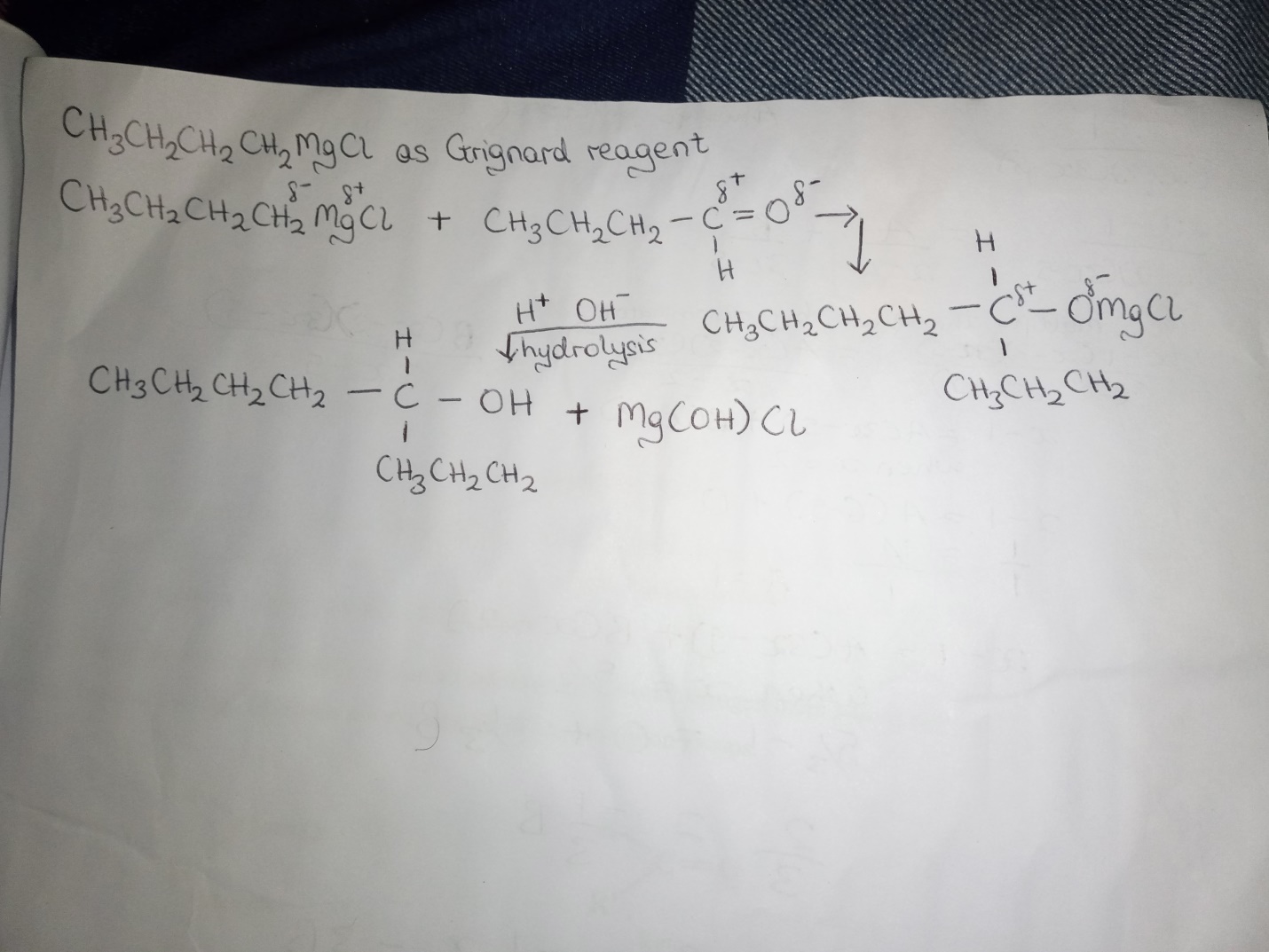
Maltose 150C/maltase glucose

* The glucose at constant temperature of 150C is then converted into alcohol by the enzyme zymase contained also in yeast

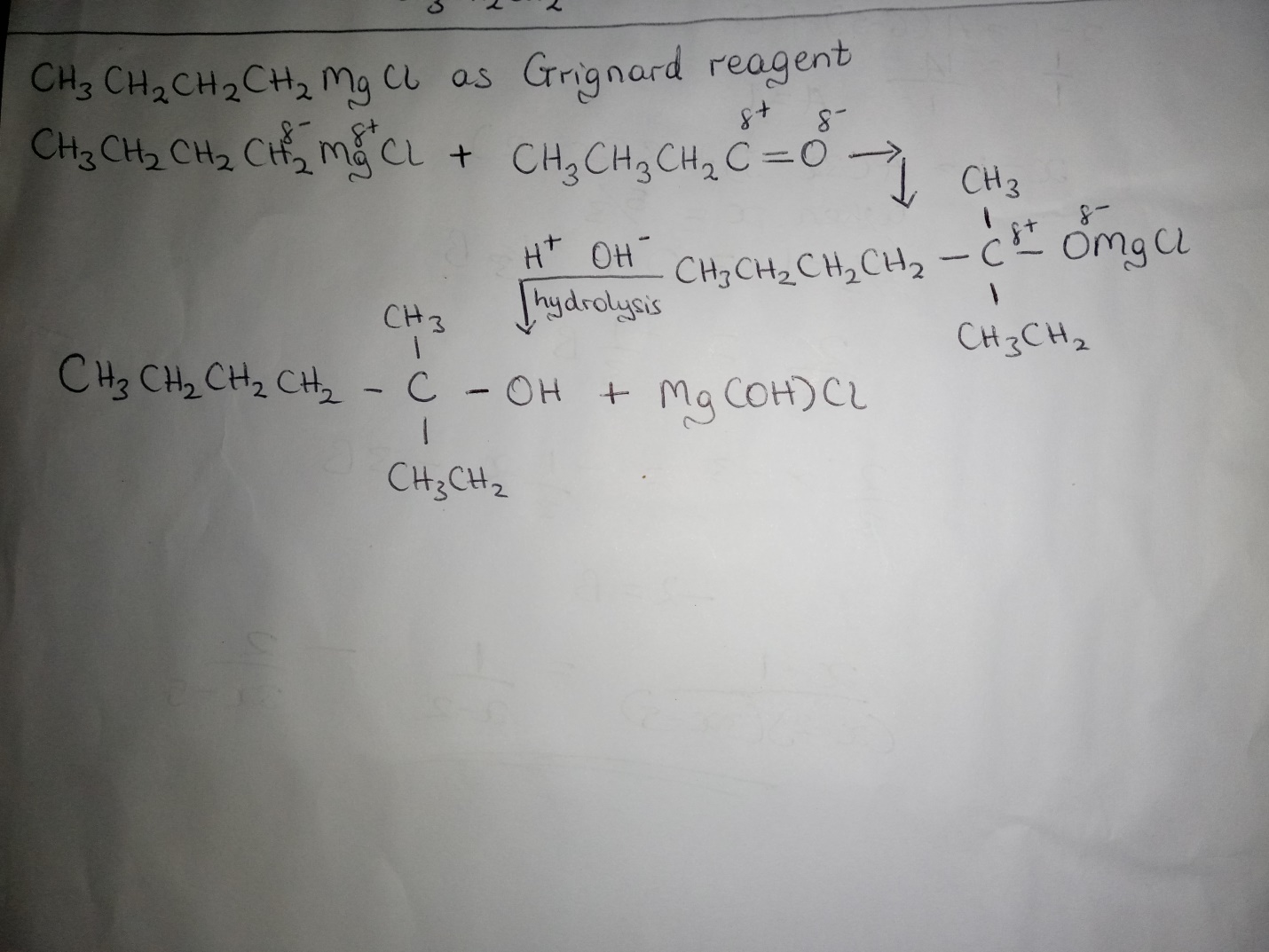
C6H12O6  2CH3CH2OH + 2CO2

Glucose 150C/Zymase Ethanol

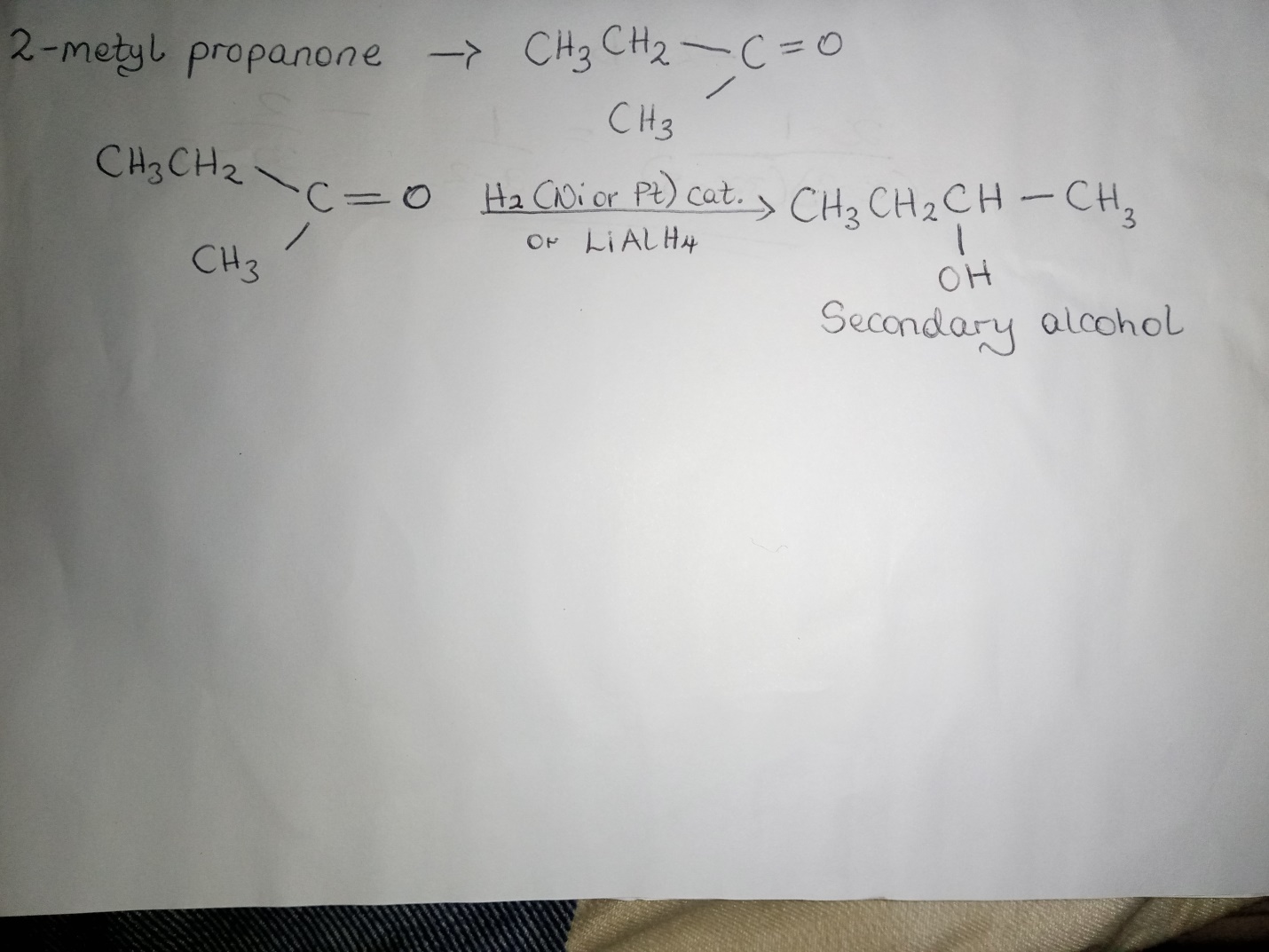
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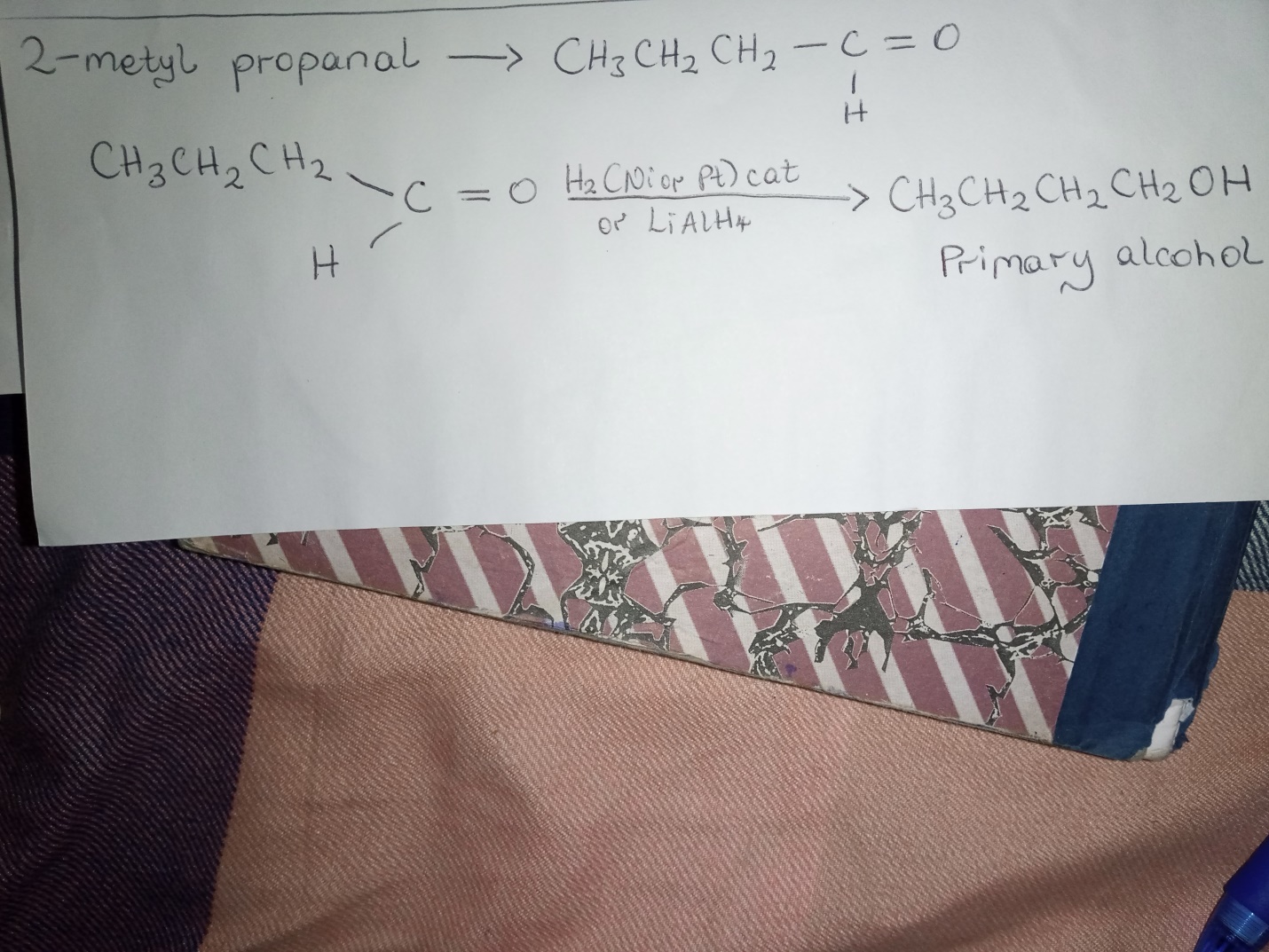
5.



6.



7.



8.

