

NAME: EGBORO BETHEL OROWO

COLLEGE: MEDICINE AND HEALTH SCIENCES

DEPARTMENT: PHARMACY

MATRIC NO.: 19/MHS11/050

DATE: 11-05-2020

CHM 102 NEW ASSIGNMENTS

1. CLASSIFICATION OF ALCOHOLS

- I. **Classification 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 bearing the hydroxyl group are three or two, it is a primary alcohol (1°). If it is one hydrogen atom, it is called a secondary alcohol (2°) and if no hydrogen atom is attached to the carbon atom bearing the hydroxyl group, it is called a tertiary alcohol (3°). Example: CH_3OH Methanol(1°)

- II. **Classification based on the number of hydroxyl groups they possess-** Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohol or Glycols have two hydroxyl groups present in the alcohol structure while trihydric alcohols or triols have three hydroxyl groups present in the alcohol structure. Polyhydric alcohols or polyols have more than three hydroxyl groups. Example: $\text{HOCH}_2\text{CH}_2\text{OH}$ ethane-1, 2-diol (Dihydric alcohol).

2. SOLUBILITY OF ALCOHOLS IN WATER AND ORGANIC SOLVENTS

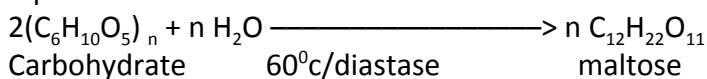
In water- lower alcohols with up to three carbon atoms in their molecules are soluble in water because these lower alcohols can form hydrogen bond with water molecules. The water solubility of alcohols decreases with increasing relative molecular mass.

In organic solvents- 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 with water molecules.

3. INDUSTRIAL PREPARATION OF ETHANOL

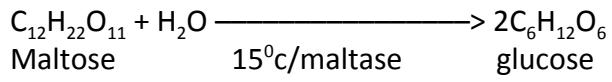
- I. Carbohydrate such as starch is warmed with malt to 60°C and is then converted to maltose by the enzyme diastase contained in the malt.

Equation for the reaction:



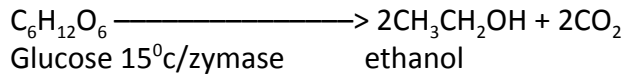
II. The maltose is broken down to glucose on addition of yeast which contains the enzyme maltase and at a temperature of 15⁰c

Equation for the reaction:



III. The glucose at a constant temperature of 15⁰c is then converted into alcohol by the enzyme zymase contained also in yeast

Equation for the reaction:

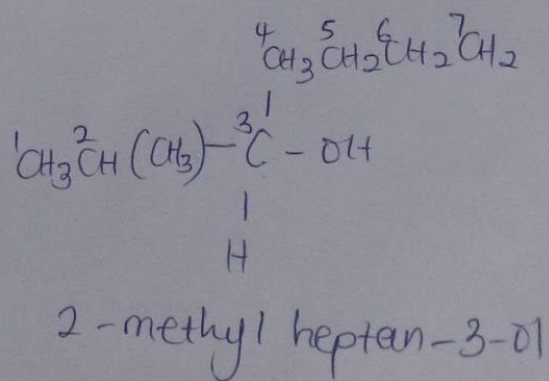
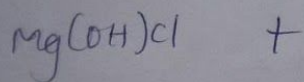
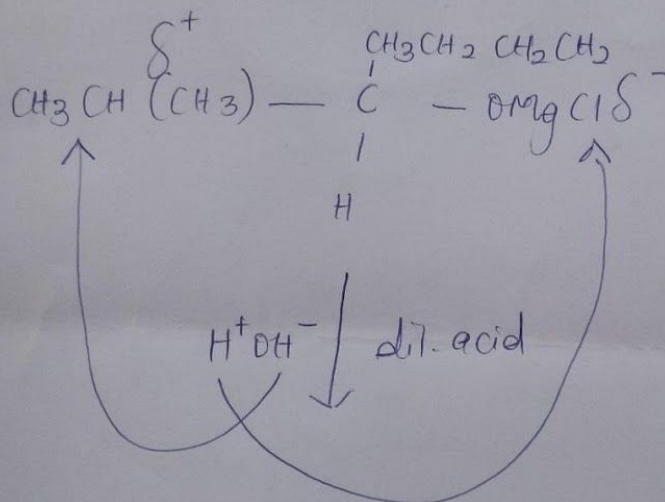
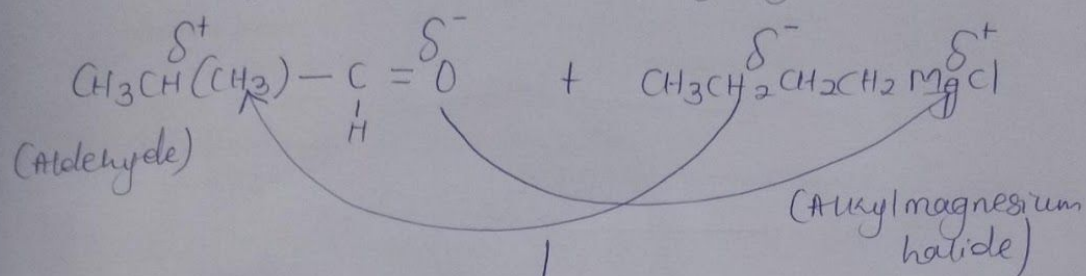


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Grignard Synthesis

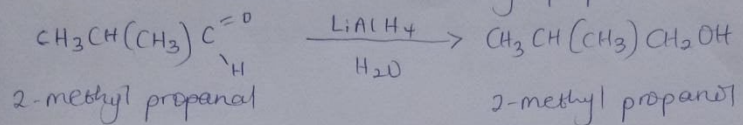
2-methyl propanal and butylmagnesium chloride



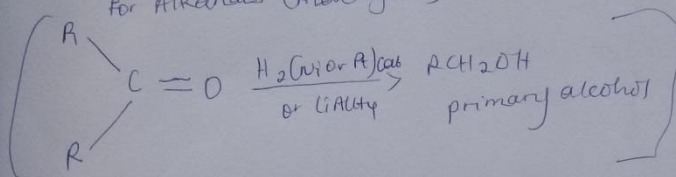
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Reduction Reaction of 2-methyl propanal



For Alkanals (Aldehydes)

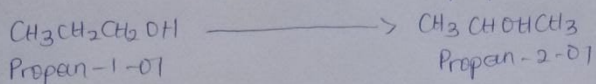


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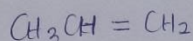
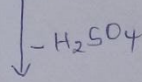
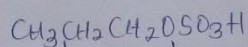
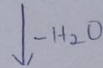
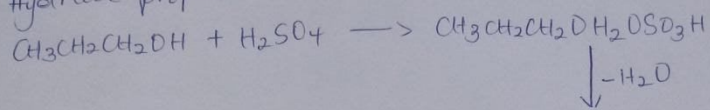
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Conversion of propan-1-ol to propan-2-ol

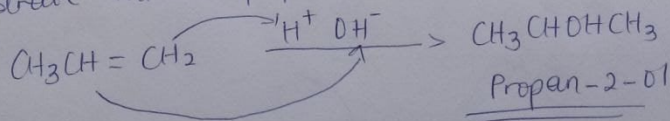


- Hydrate propan-1-ol



Propene

- Hydrate alkene (propene)



8.