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ANSWERS

1. There are two major classification of Alkanols.

a) BASED OF THE NUMBER OF HYDROGEN ATOMS ATTACHED TO THE CARBON ATOM CONTAINING THE HYDROXYL GROUP. NOTE: if the ⁿ number of hydrogen atoms attached to the carbon atom bearing the hydroxyl group are three or two, it is called a Primary alcohol (1°), if it is one hydrogen atom then it is known as 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°).

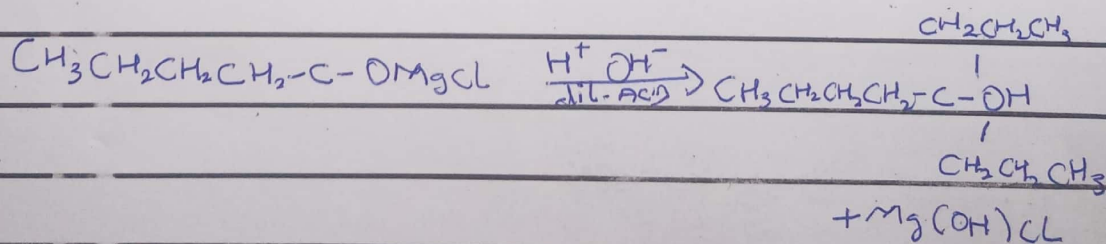
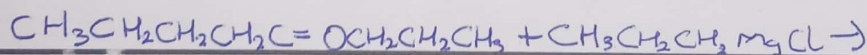
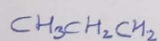
Examples: (i) $\text{CH}_3\text{CH}_2\text{OH}$ Ethanol (1°) (ii) $(\text{CH}_3)_2\text{C}-\text{OH}$ 2-methyl Propan-2-ol (3°)

b) BASED ON THE NUMBER OF HYDROXYL GROUP THEY POSSESS. Monohydric alcohol has one hydroxyl group present in the alcohol structure, Dihydric alcohols are also known as Glycols and they have two hydroxyl groups present in the alcohol structure while trihydric alcohols or tritols have three hydroxyl group present in the structure of the alcohol, ^m Polyhydric alcohols or Polyols have more than three hydroxyl groups

Examples (i) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ Propanol (Monohydric alcohol)

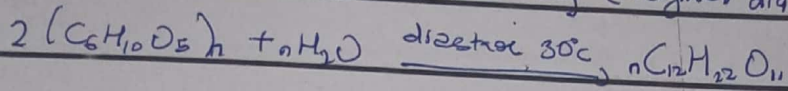
(ii) $\text{OHCH}_2\text{CH}(\text{OH})\text{CH}_2\text{OH}$ Propane-1,2,3-triol (Trihydric alcohol)

2. In the Grignard synthesis of alkanols, react a named Grignard reagent with

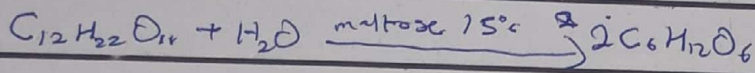


3) Ethanol is produced industrially by the fermentation of starch

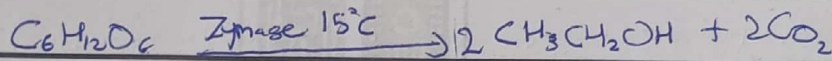
- The starch is turned into maltose by enzyme diastase at 30°C



- The maltose is converted into glucose by the enzyme maltase found in yeast at a temperature of 15°C



→ Finally, the glucose is converted into ethanol by the enzyme zymase also found in yeast at a temperature of 15°C



4 - Aldehydes and ketones are reduced to primary and secondary alcohols respectively by reaction with hydrogen in the presence of platinum or nickel catalyst or with aluminum isopropoxide (the Meerwein-Ponndorf rxn) or with complex metal hydride, such as lithium tetrahydridoaluminate (III) (LiAlH₄) or sodium tetrahydridoborate (III) (NaBH₄)

Examples:

