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MACHINONIS DEPARTMENT

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Assignment

1. Alcohols are very important organic compounds. Discuss briefly their classification and give one example each.

Solution.

Classification of Alcohols

1. 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 bearing the hydroxyl group are three or two, it is called primary alcohol (1°), one hydrogen atom is called secondary alcohol (2°) and no hydrogen atom is called tertiary alcohol. Example, CH_3OH Methanol (1°).

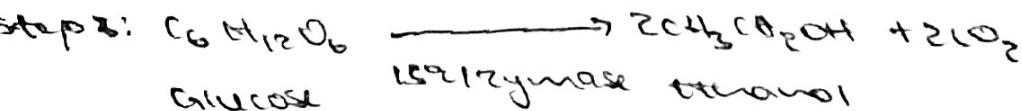
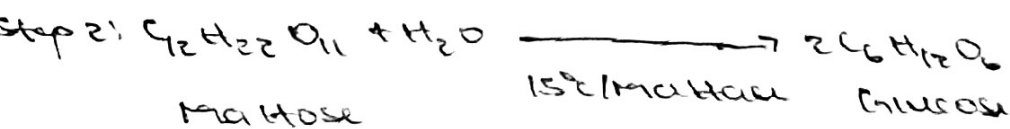
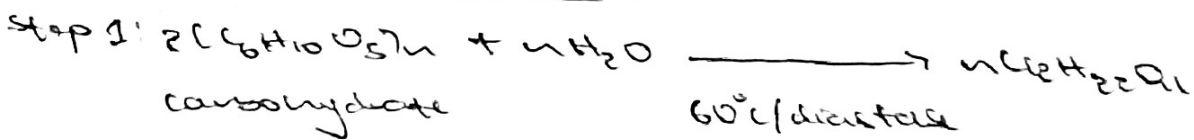
2. This is based on the number of hydroxyl groups they possess. Monohydric alcohols have one hydroxyl group present, dihydric alcohols have two hydroxyl groups present in the alcohol structure while trihydric alcohols have three hydroxyl groups. Example, $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ Propanol (Monohydric alcohol).

2. Discuss the solubility of alcohols in water-organic solvents.
 Solubility \rightarrow 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. 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. Show the three steps in the industrial manufacture of ethanol. Equations of reaction are mandatory.

Production of ethanol

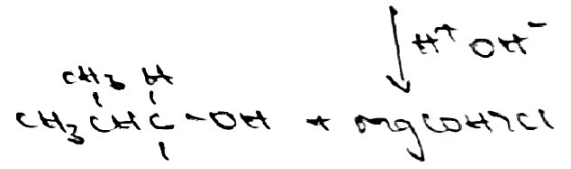
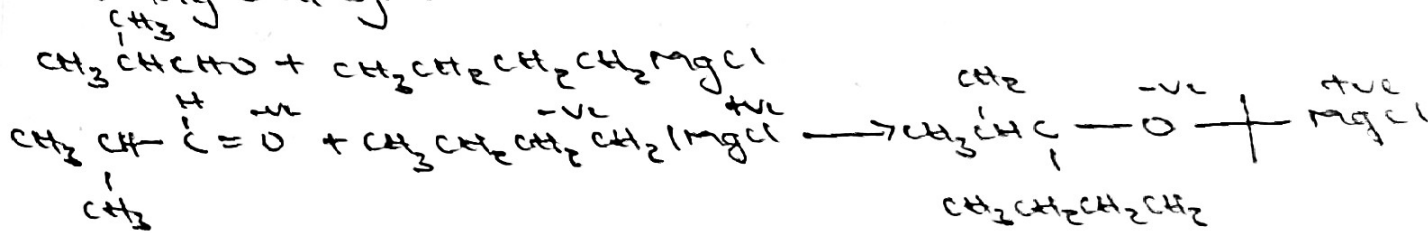
fermentation reaction.



propen-2-ol

4. Show the reaction between 2-methyl propanal and butyl magnesium chloride

Hint: Grignard synthesis



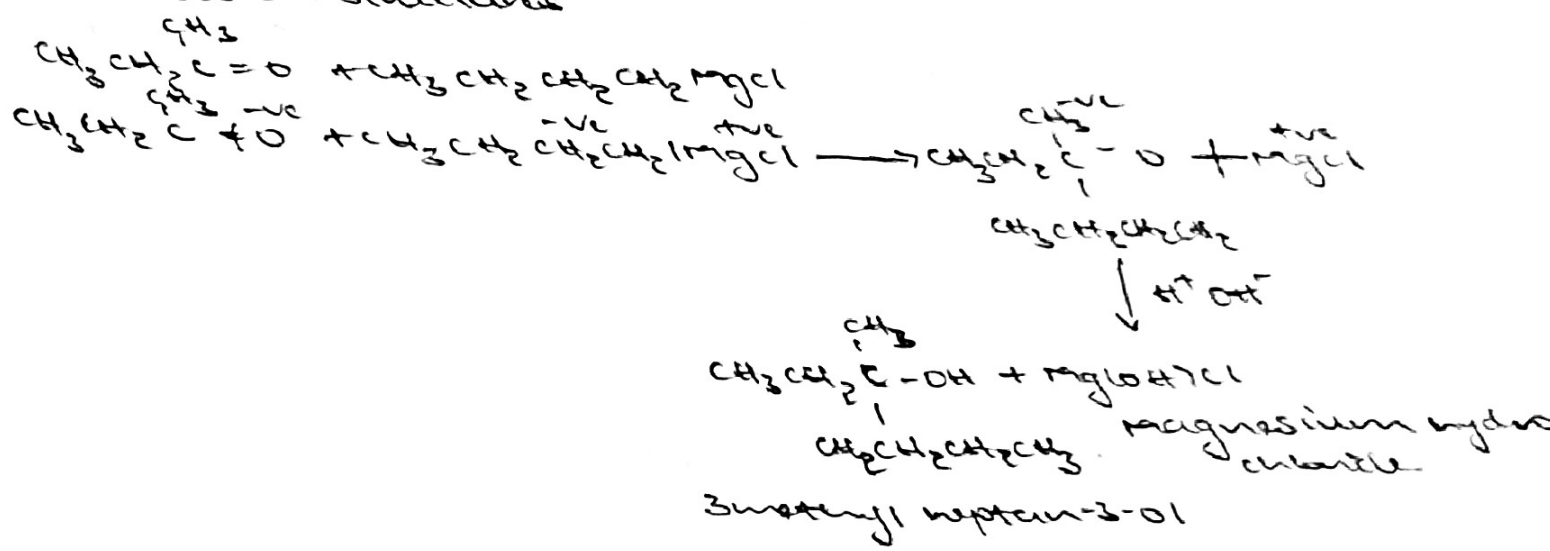
2-methyl heptan-3-ol
-3-ol

magnesium hydroxide chloride

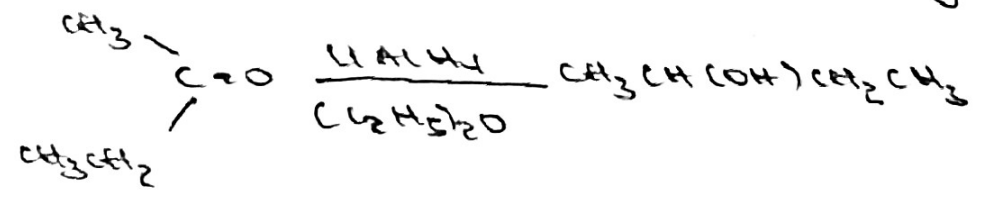
2. show the reaction between 2-methyl propanone and butyl mag.
nesium chloride

What Grignard synthesis is

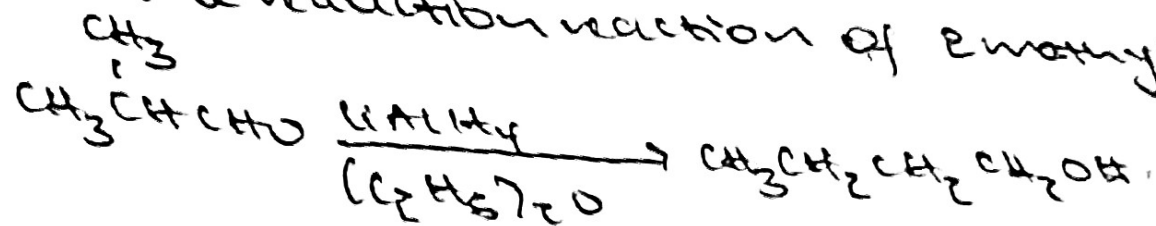
Note: show all structures



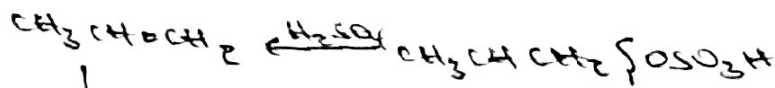
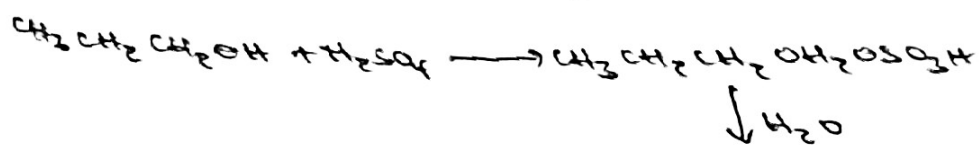
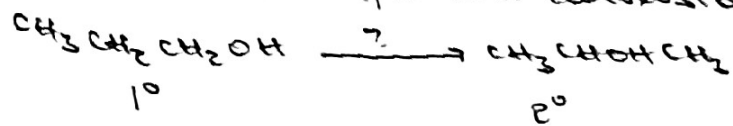
3. show the reduction reaction of 2-methyl propanone



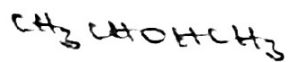
7. show the reduction reaction of 2-methyl propanal



8. Propose a scheme for the conversion of propan-1-ol to propan-2-ol.



propyl hydrogen sulphate.



Propan-2-ol