CHM102 Assignment

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- 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 a primary alcohol (1°). If it is one hydrogen atom, it is called secondary alcohol (2°) and if no hydrogen atom is attached to the carbon bearing the hydroxyl group, it is called a tertiary alcohol (3°). An example is: CH3OH Methanol (1°)
- This is based on the number of hydroxyl groups they posses. Monohydric alcohols have one hydroxyl group present in the alcohol structure. Dihydric alcohol are also called Glycols which have two hydroxyl groups present in the alcohol structure while trihydric alcohols or triols have three hydroxyl groups present in the structure of the alcohol. Polyhydric alcohols or polyols have more than three hydroxyl groups. An example is CH3CH2CHOH propanol (Monohydric alcohol).

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CH3CH2CH2CH2C=OCH2CH2CH3 + CH2MgCH2
|
CH3CH2CH2CH2CH2C + OMgCH2CH2CH2CH3
| H+&OH- CH3CH2CH2CH2CH2COH+Mg(OH)CH2CH2CH2CH3
CH2MgCH3 as Grignard reagent

3

Production Of Ethanol

Carbohydrates such as starch are major group of natural compounds that can be made to yield ethanol by the biological process of fermentation. The biological catalysts, enzymes found in yeast break down the carbohydrate molecules into ethanol to give a yield of 95%. The starch containing materials include molasses, potatoes, cereals, rice and on warming with malt to 60% for specific period of time are converted into maltose by the enzyme diastase contained in th malt.

2(C6H10O5)n + nH2O — nC12H22O11
Carbohydrate Maltose

C12H22O11 + H2O — 2C6H12O6
Maltose Glucose

C6H12O6 — 2CH3CH2OH + 2CO2
Glucose Ethanol

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Reduction of methanal (formaldehyde) gives methanol. **Reduction** of other aldehydes gives primary alcohols. **Reduction** of ketones gives secondary alcohols. The acidic work-up converts

an intermediate metal alkoxide salt into the desired alcohol via a simple acid base reaction.