# FILL IN THE BLANKS:

## Fermentation:

Is the chemical _____ of organic material in the absence of oxygen (anaerobically). Fermentation is used in the brewing industry to manufacture beer and cider.
Fermentation is carried out by _____ such as yeast. The microbes act as a _____ for the reaction.
In the production of beer, the yeast converts a malted grain into _____ and carbon dioxide. The sugar source for beer is malted grains.

$$\_\_\_\_\_ \rightarrow \_\_\_\_\_ + \_\_\_\_\_$$

$$C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$$

The sugar source is different for different alcoholic beverages.

- Beer's sugar source is malted grains
- Wine's sugar source is _____
- Cider's sugar source is _____

It is impossible to produce alcoholic drinks of 40% v/v by fermentation alone.

- Beer and Cider is about 8% v/v
- Wine is about 12 % v/v

The ethanol that the yeast cells produce during fermentation eventually kills the yeast. The fermentation process is then stopped. Different types of yeasts have different tolerance levels to the ethanol.

To produce alcoholic drinks of a higher concentration, the fermented liquid must be _____.

## Distillation:

Is the process of _____ two miscible liquids based on their boiling points. Distillation is used in the distillery industry to produce alcoholic drinks of higher _____ such as spirits like whiskey, brandy, gin and vodka (40 % v/v). In this process, the fermented liquid is _____. Ethanol evaporates and the vapour is collected and cooled back into a liquid. The distilled liquid is called the _____.

- Ethanol has a boiling point of 78 ℃
- Water has a boiling point of 100 ℃

## Concentration:

The concentration of a solution is the amount of _____ that is dissolved in a given volume of _____.

## % v/v :

Concentration can be expressed in the form of _____ per _____ (% v/v).
A concentration of 40 % v/v means that there is 40 cm³ _____per 100 cm³ _____.

$$\text{Concentration \% v/v} = \frac{Volume\ of\ \_\_\_\_\_}{Volume\ of\ \_\_\_\_\_}\ x\ 100$$

## Functional Group:

Is an atom or group of atoms responsible for the common _____ of certain compounds, especially organic compounds. The functional group of alcohols is _____.

## Homologous Series:

Is a series of compounds with the same _____ _____ and similar chemical properties.

## Primary Alcohols:

The carbon with the OH is joined to _____ other carbon atom. (or none in the case of methanol)

## Secondary Alcohols:

The carbon with the OH is joined to _____ other carbon atoms.

## Tertiary Alcohols:

The carbon with the OH is joined to _____ other carbon atom.

## Tetrahedral Shape:

The bond angle in a tetrahedral shape is _____°

## V-Shaped Shape:

The bond angle in a V-Shaped is _____°.

## Solvent:

Is a substance that dissolves another substance to form a _____.

## _____ Agent:

An additive added to alcohol (e.g. methanol) to make it poisonous, bad tasting, foul smelling or nauseating, to discourage recreational consumption. In some cases, it is also dyed.

## Catalyst:

Is a substance that _____ the speed of a chemical reaction without being consumed by the reaction

## Dehydration/ Elimination:

A chemical reaction whereby water is _____ from ethanol to form _____. This is done by passing ethanol vapour over hot _____ _____ ($Al_2O_3$)

## Oxidation:

A chemical reaction converting a primary alcohol to a _____ and a secondary alcohol to a _____by the removal of 2H atoms.

## Esterification:

A chemical reaction where an alcohol reacts with an _____ to form an _____ and water.