

ALCOHOL PRODUCTION

Gautam Singh , Hospitality Trainer , 07830294949

PRODUCTION METHODS

➤ Session Objectives-

- By the end of the session one should be able to distinguish between Fermentation and distillation and recall the two types of distillation method used

CONTENTS

➤ FERMENTATION

➤ DISTILLATION-

○ POT STILL DISTILLATION

○ PATENT STILL DISTILLATION

FERMENTATION

- Fermentation is the action of yeast in a sugar solution, which breaks down the sugar into carbon dioxide and alcohol
- CO₂ escapes into the air, and the alcohol, a liquid, remains behind in the original liquid, which thus becomes a fermented beverage
- Beer and wines are fermented beverages

FERMENTATION

- All alcoholic beverages begin with the fermentation of a liquid food product containing sugar.
- Formula = $(C_6 H_{12} O_6)N + \text{yeast} \rightarrow 2C_2H_5OH + 2CO_2$

DISTILLATION

- Water evaporates at 100°C, and ethyl alcohol evaporates at 78°C (to maximum)
- This is used to separate ethyl alcohol from water & residue, it is of Dutch origin

POT STILL DISTILLATION



POT STILL DISTILLATION

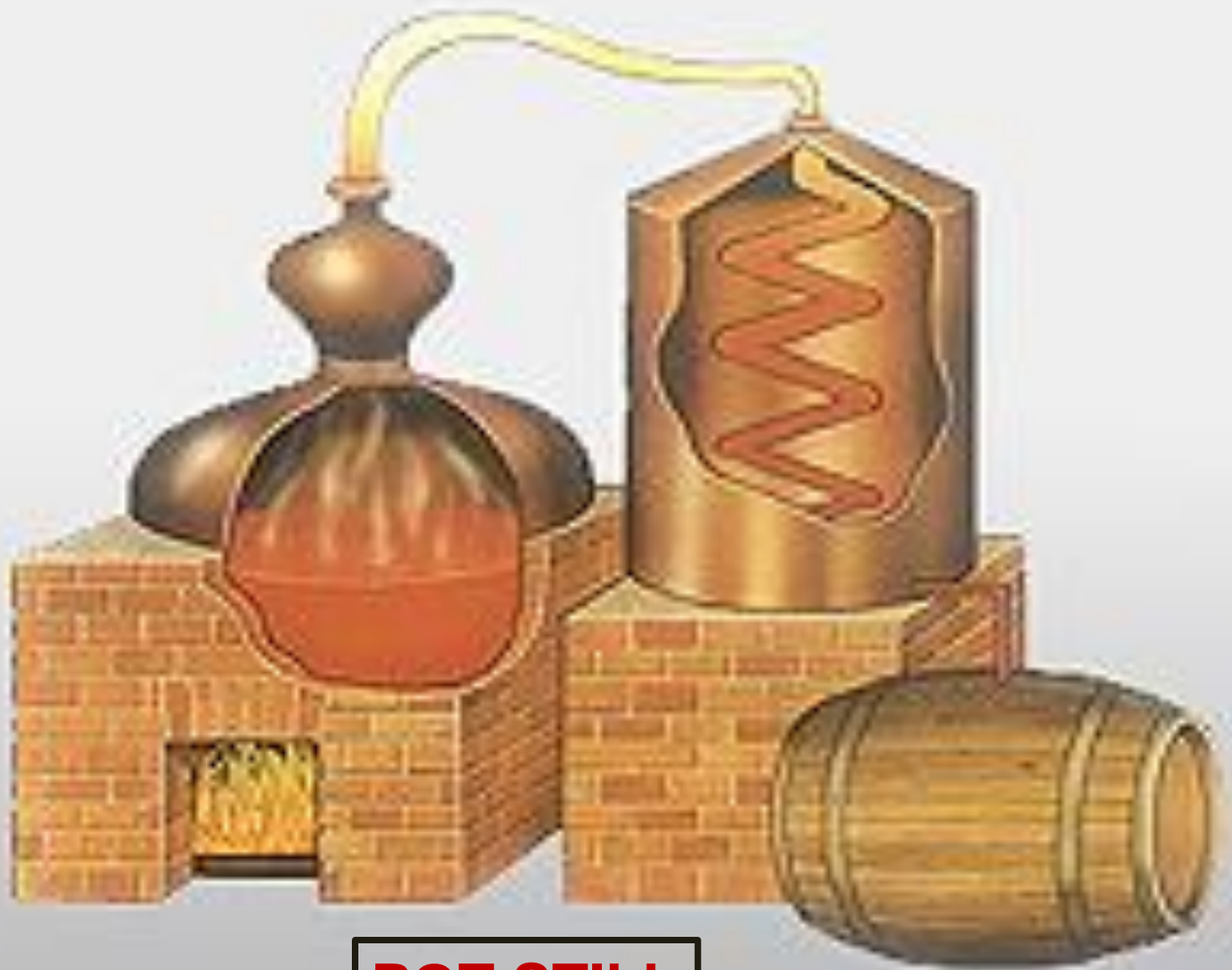
- Pots are made of copper, with a capacity 1000 to 1200 litres, also called alembics.
- Copper is a good conductor of heat & does not react with alcohol
- They are supported on brick kilns with fire beneath in group of twos

POT STILL DISTILLATION

- The wash is filled in the alembics, and it starts heating
- Both the vapours of alcohol & water rise up, but more of alcohol as it vaporizes at 78°C
- The vapours pass through condensers and condense into the vessel on other side

POT STILL DISTILLATION

- First distillate yields 25 to 30 % alcohol
- Second distillate yields 65 to 70% alcohol
- Distilled water is added to bring down the strength to 43%.
- First lot of vapours are called heads or fore shoots & the last lot of vapours are tails



POT STILL

COFFEY / PATENT STILL DISTILLATION

- Invented by Robert Stein which was later modified and patented by Aeneas Coffey in the year 1831
- It is a continuous distillation, process
- There are two towers 80 feet high
- First one is analyzer and second is rectifier

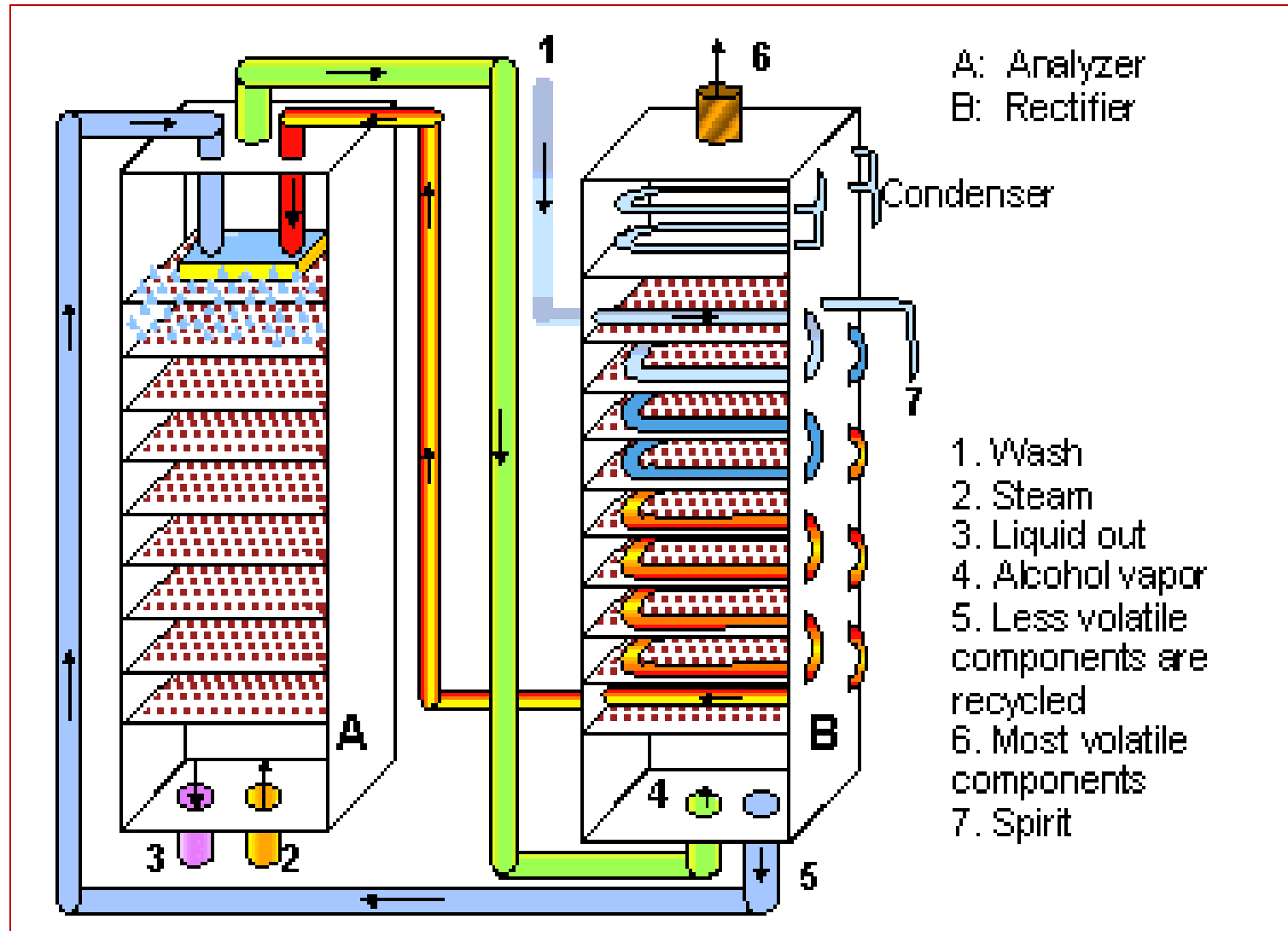
COFFEY / PATENT STILL DISTILLATION

- Hot wash is pumped into rectifier column & steam is injected in analyzer
- Both mix up in baffles (special perforated trays) resulting in formation of vapors of ethanol

COFFEY / PATENT STILL DISTILLATION

- The condenser cools and condenses the ethanol vapors, the remaining vapors are recycled as spent wash
- The net result is a yield of 96% alcohol

PATENT STILL DISTILLATION



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THANK YOU

Gautam Singh , Hospitality Trainer , 07830294949