SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Approved by Pharmacy Council of India, New Delhi.
Coimbatore -641035

COURSE NAME : PHARMACEUTICAL ENGINEERING (BP404 T)

III SEM / II YEAR

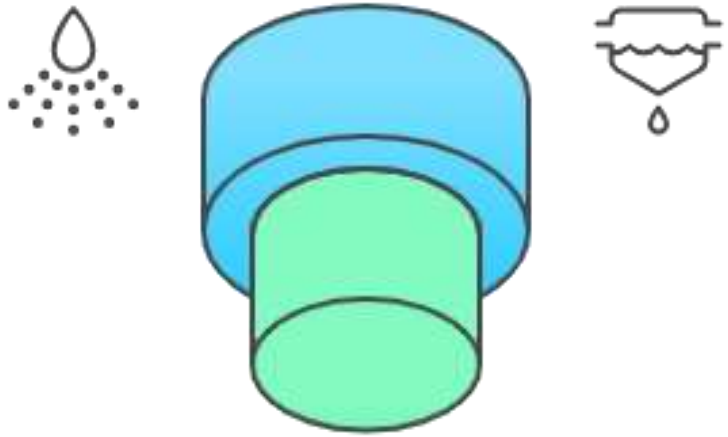
UNIT 2 :HEAT TRANSFER AND EVAPORATION

SUBTOPIC:DISTILLATION

Distillation Process Funnel

Vaporization

Components with lower boiling points vaporize



Condensation

Vaporized components condense back into liquid

Distillation Process Funnel

Heating Mixture

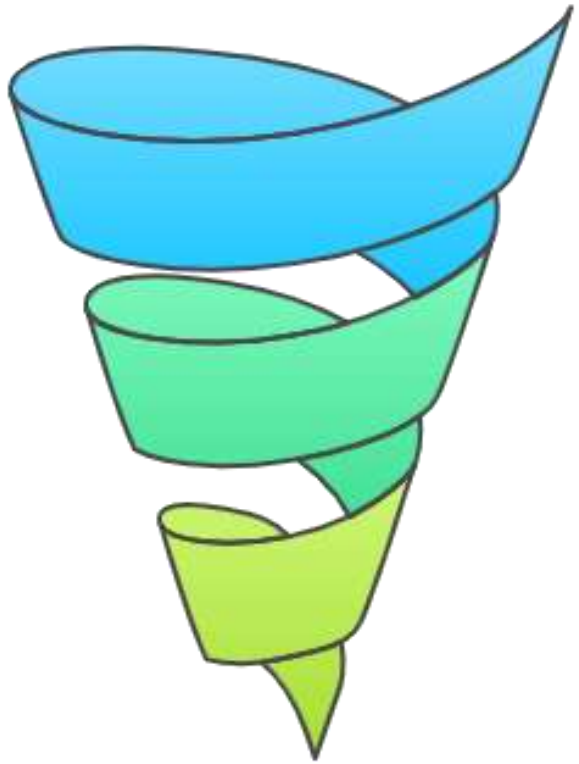
Applying heat to vaporize components

Vaporization

Component with higher vapor pressure vaporizes

Condensation

Vapor is cooled and condensed



Vapor-Liquid Equilibrium in Distillation

www.snsgroups.com

VLE Diagrams

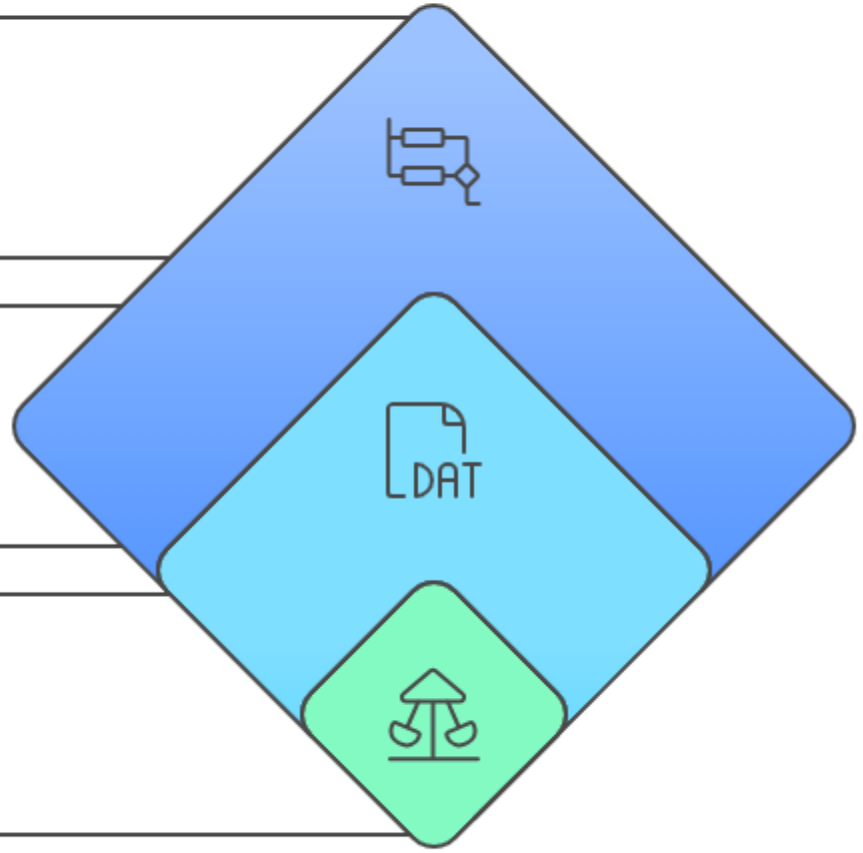
Visual representation of equilibrium

VLE Data

Essential for process design

VLE

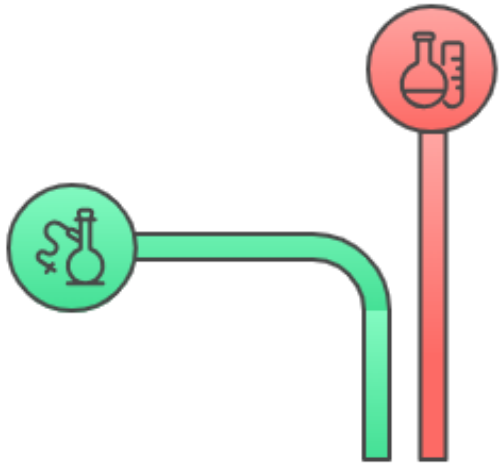
Core concept describing phase distribution



simple distillation

Not Suitable

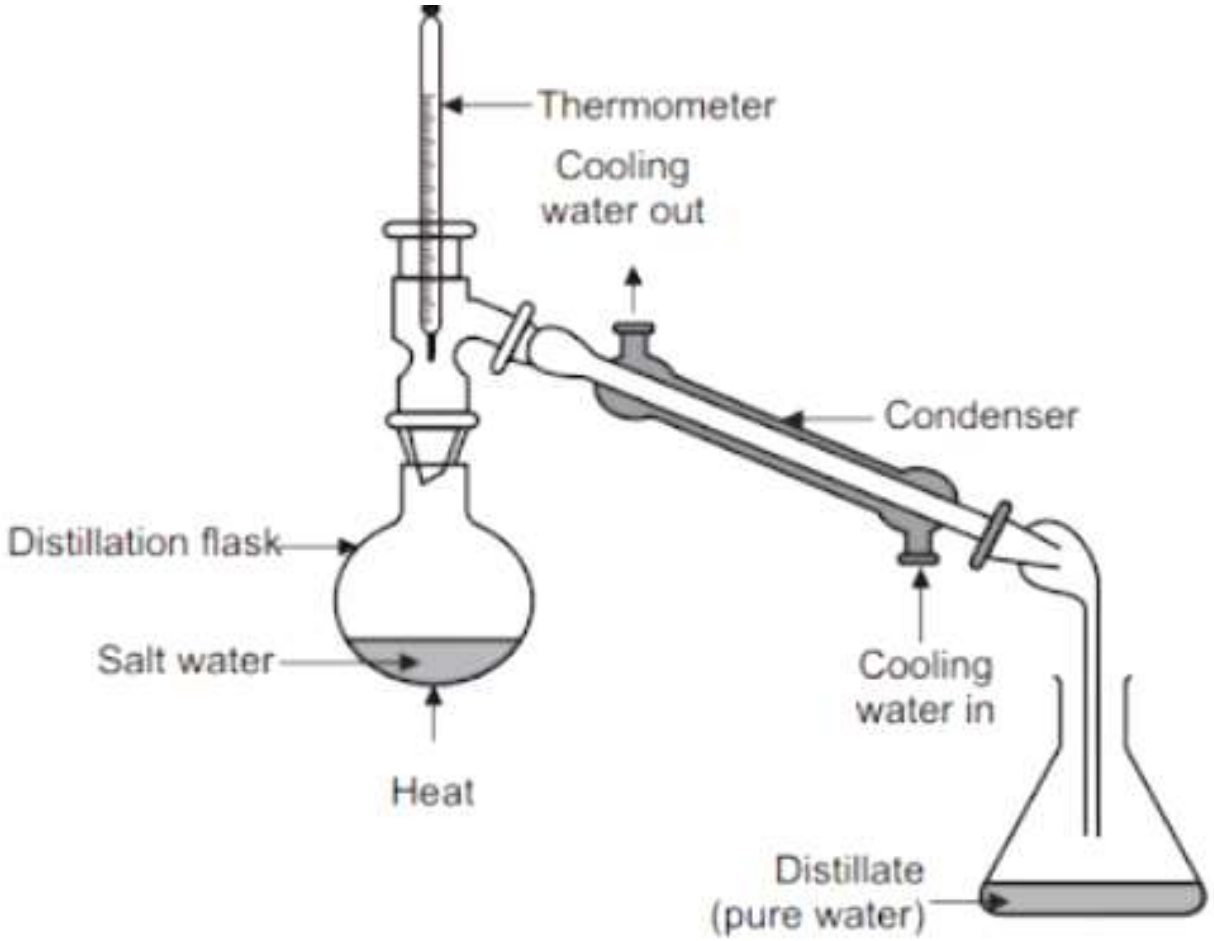
The boiling points are too close, leading to incomplete separation.



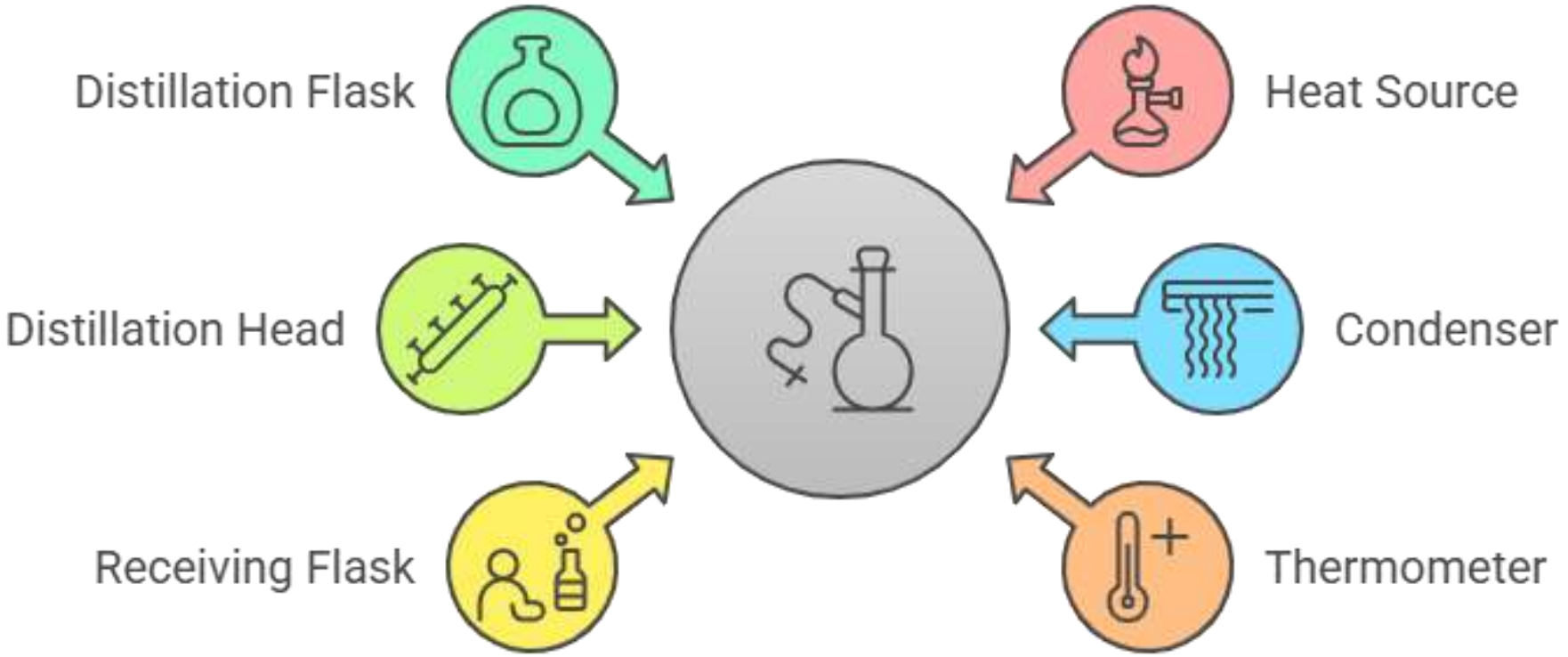
Suitable

The boiling points of the liquids are significantly different (at least 25°C), making simple distillation effective.

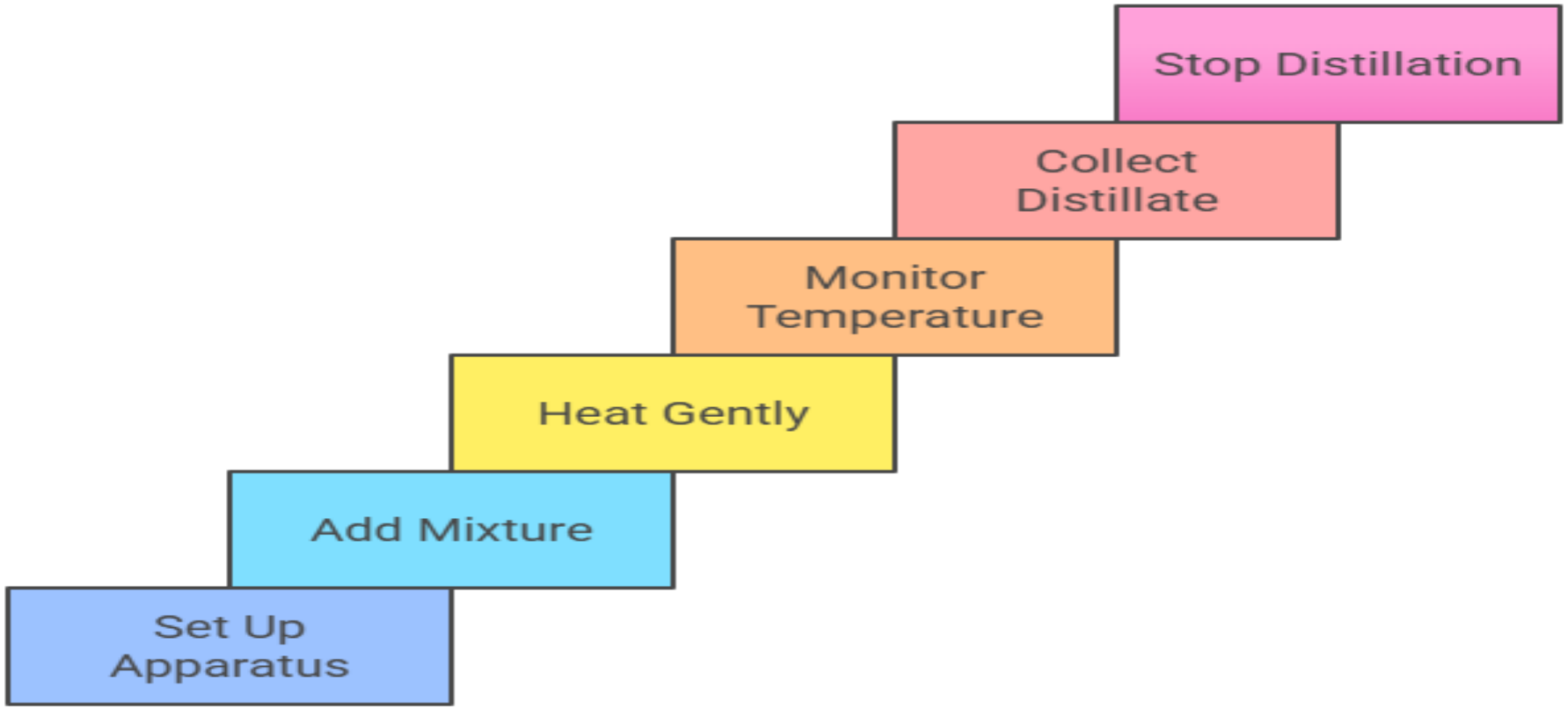
SIMPLE DISTILLATION



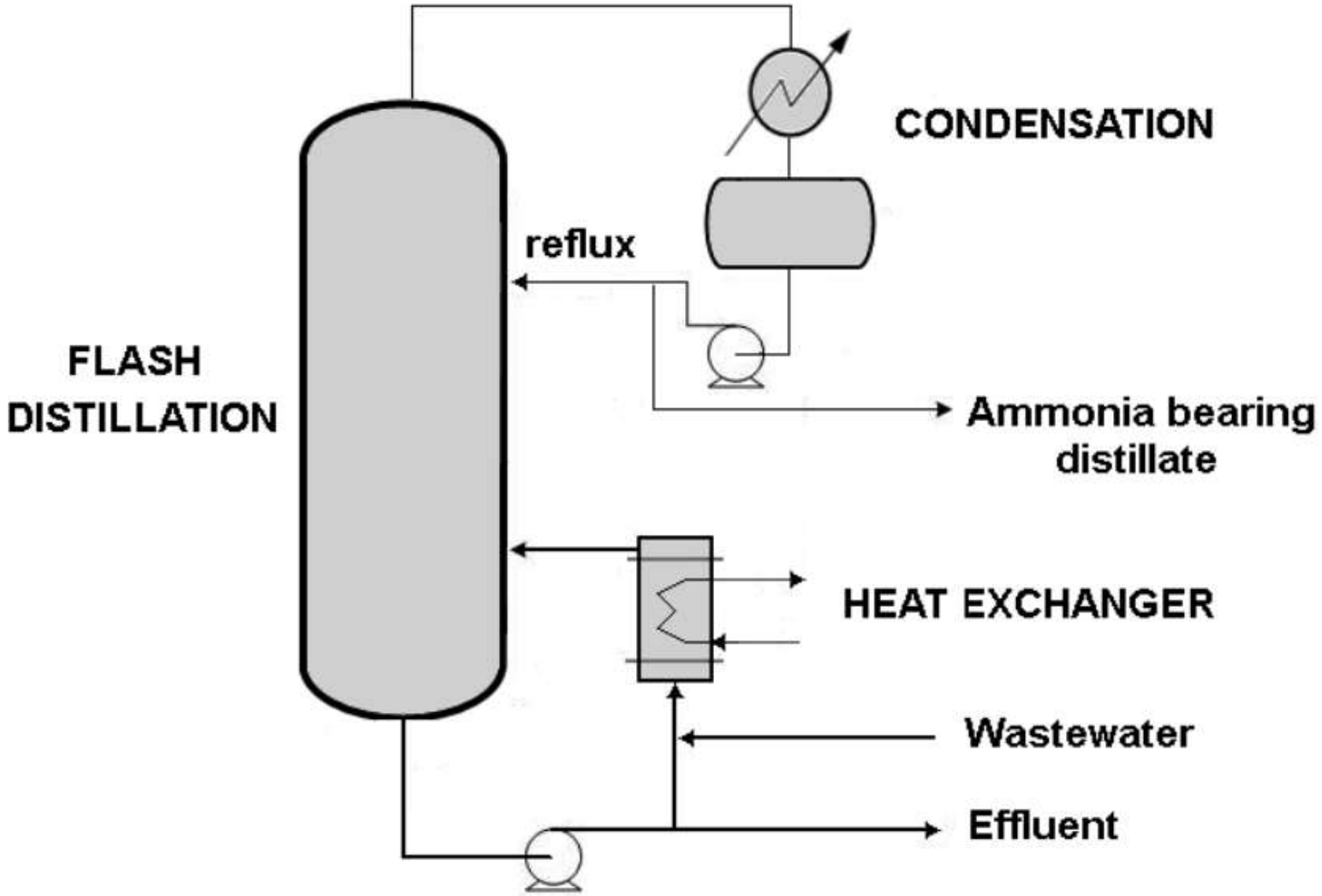
Components of a Simple Distillation Setup



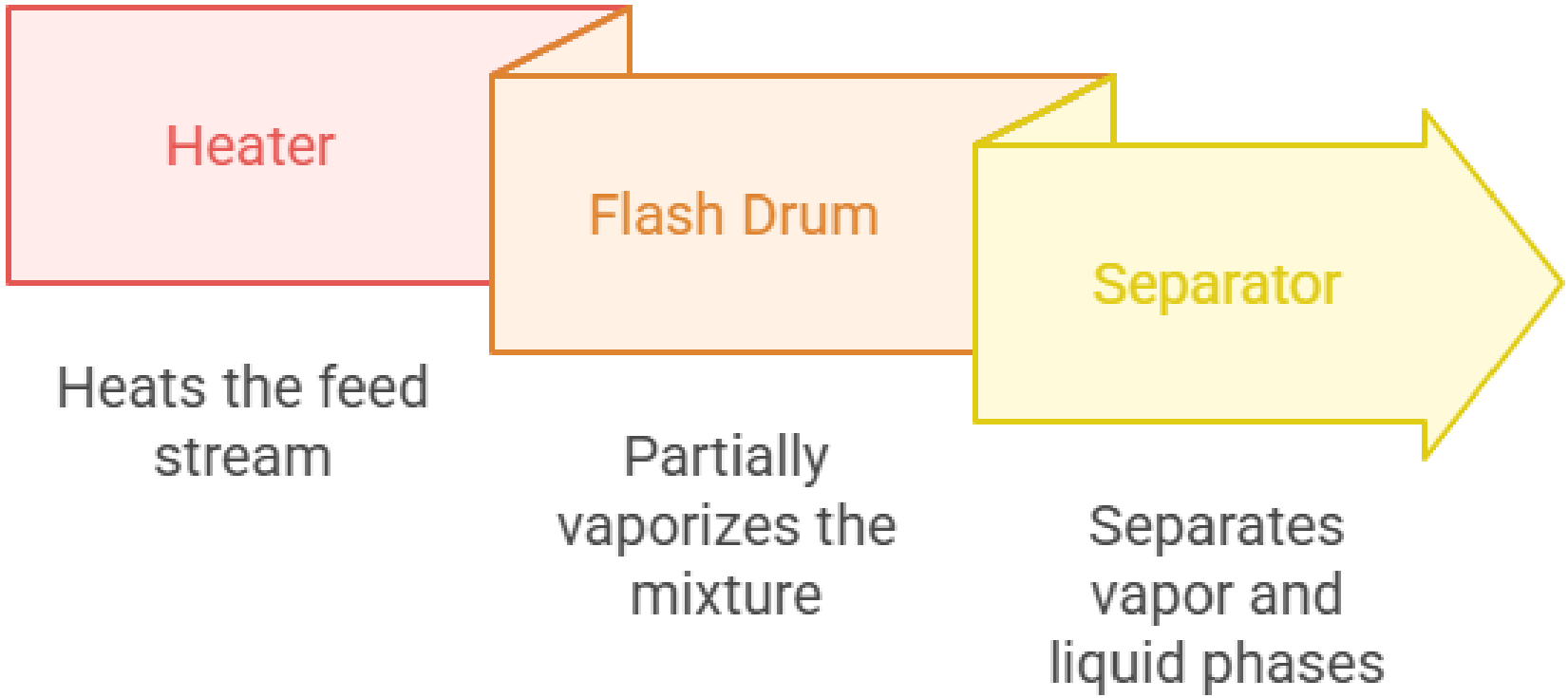
Simple Distillation Process



FLASH DISTILLATION



Flash Distillation Equipment Sequence



Made with Napkin

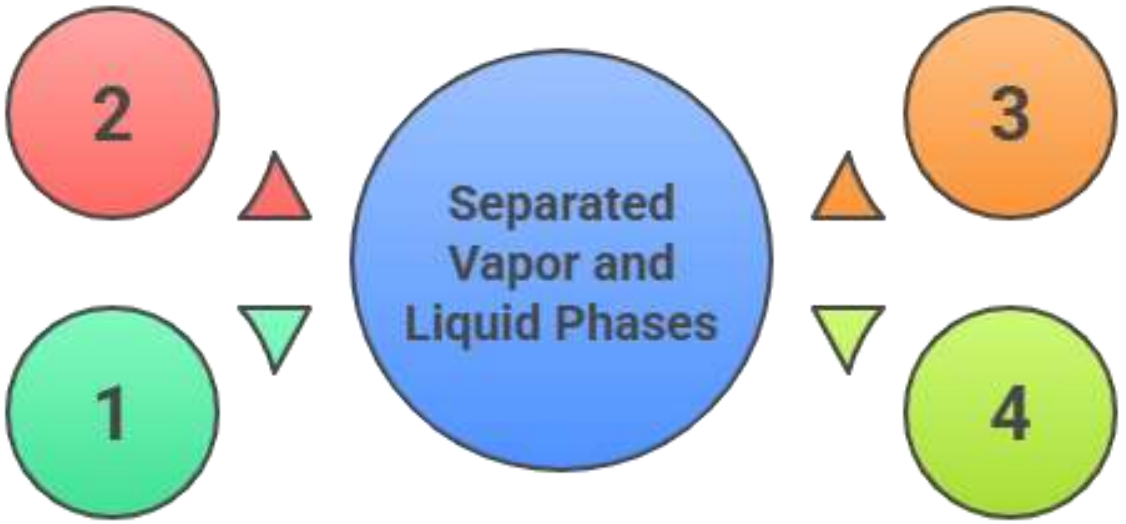
Flash Distillation Process

Pressure Reduction

The action that initiates vaporization

Liquid Mixture

The initial substance undergoing separation



Vaporization

The process of liquid turning into vapor

Equilibrium

The state where vapor and liquid are balanced

Flash Distillation Process

Heating

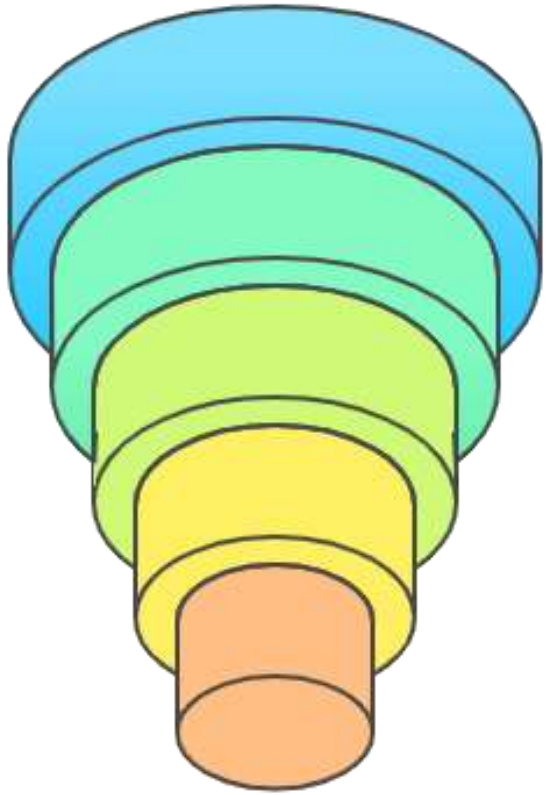
Increasing the temperature of the liquid

Vaporization

Liquid partially turns into vapor

Vapor Collection

Vapor is collected for further use



Pressure Reduction

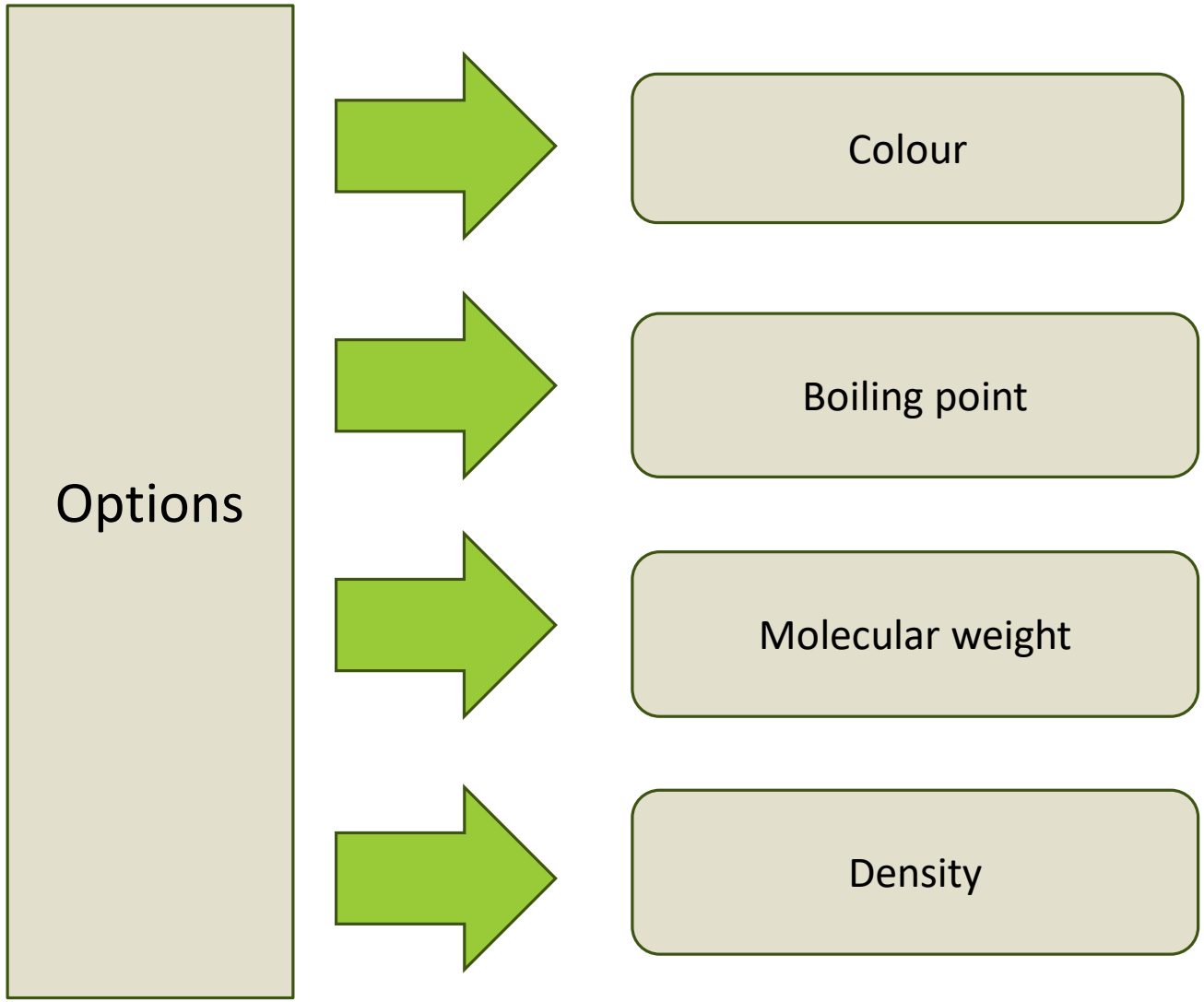
Lowering the pressure to induce vaporization

Separation

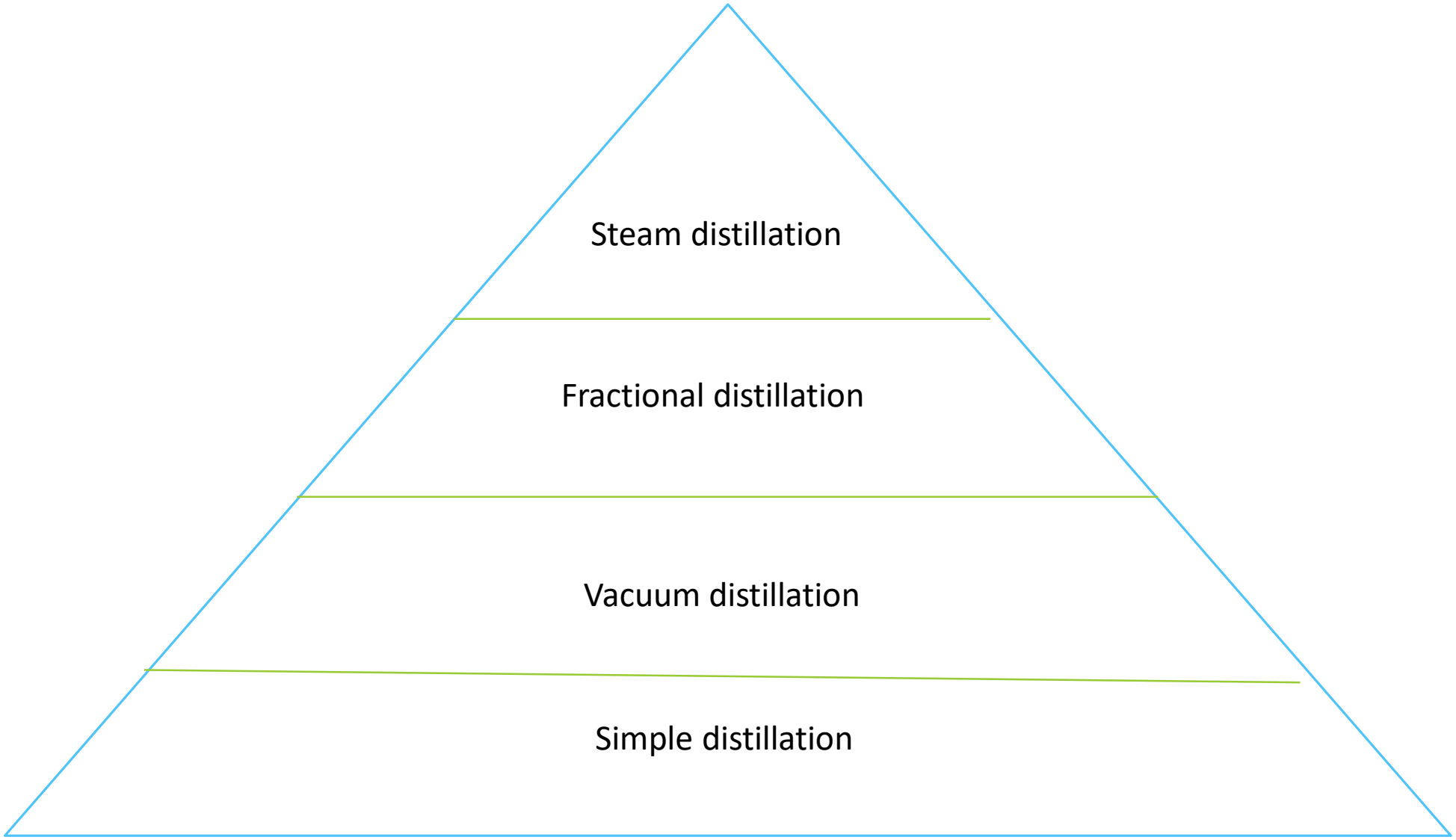
Vapor and liquid phases are divided

ASSESMENTS

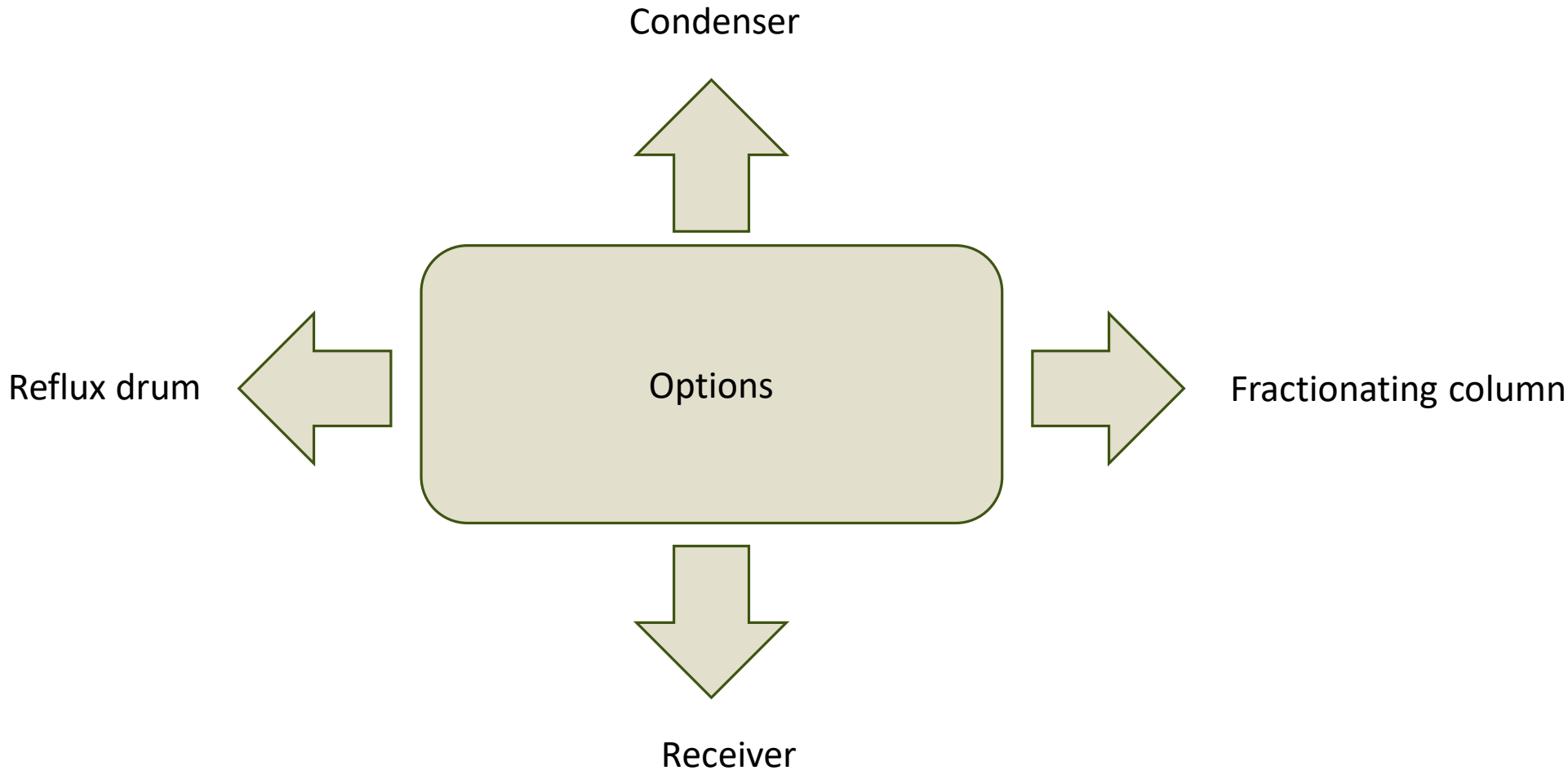
1. Distillation is a process used to separate components based on differences in their?


Options
Colour
Boiling point
Molecular weight
Density

Which type of distillation is used for heat-sensitive medicines like essential oils?


Steam distillation
Fractional distillation
Vacuum distillation
Simple distillation

3. What is the key equipment in distillation that provides surface area for repeated condensation and vaporization?


Condenser
Reflux drum
Options
Fractionating column
Receiver

REFERENCES

1. Yie W. Chien: Novel Drug Delivery Systems, Second Edition, Marcel Dekker, Inc, 1992 Pg no.816.

2. Joseph R. Robinson: Sustained and Controlled Release Drug Delivery Systems, First edition, Volume 6, Marcel Dekker, Inc,1986,pg.618.

3. https://www.sciencedirect.com/journal/journal-of-controlled-release

4. https://www.tandfonline.com/doi/full/10.1080/10837450.2018.1534376

5. https://www.scribd.com/document/668313752/Controlled-and-Novel-Drug-Delivery-by-N-K-Jain-1st-Editn-Reprint

THANK YOU