SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

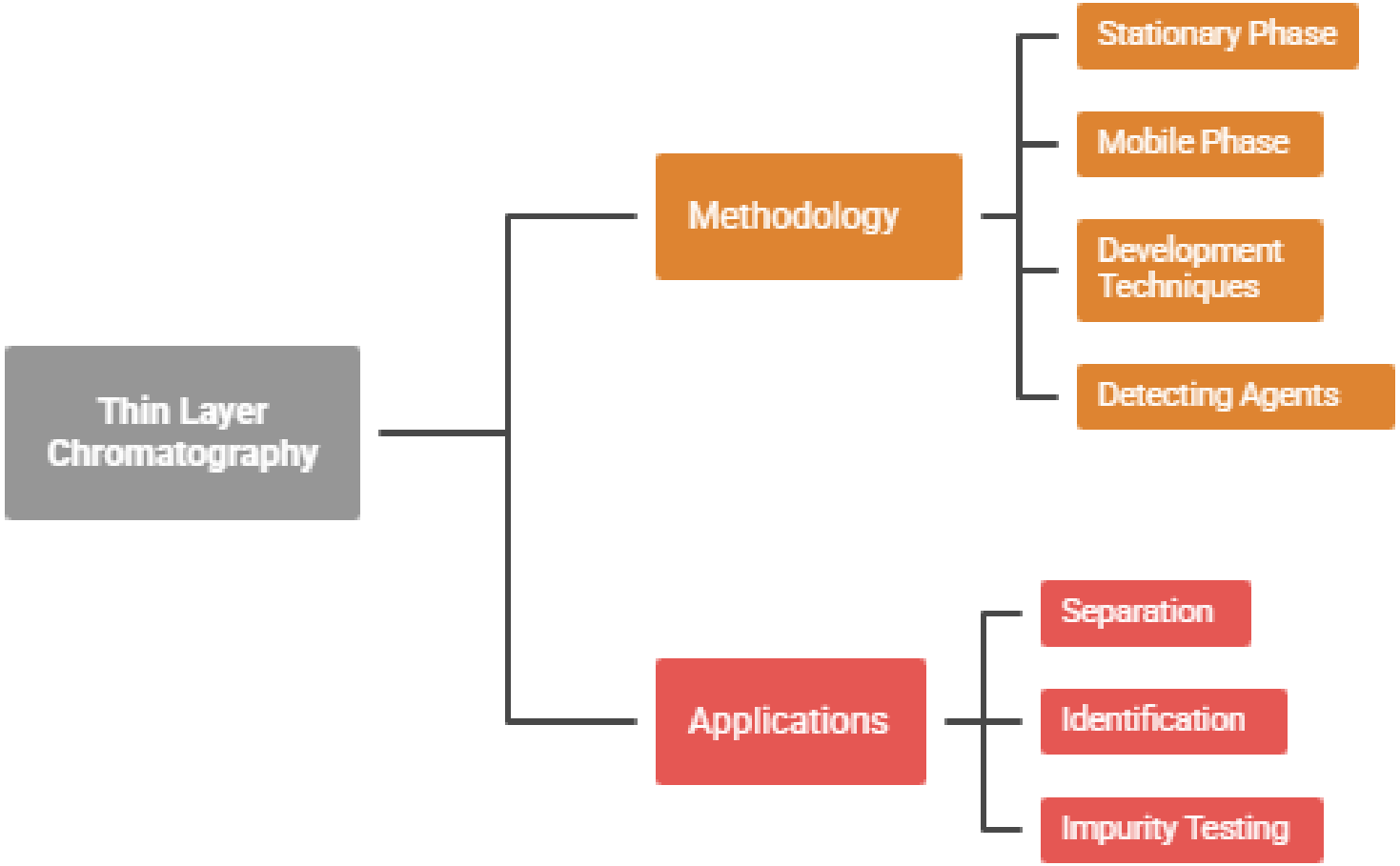
Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Approved by Pharmacy Council of India, New Delhi.
Coimbatore -641035

COURSE NAME: INSTRUMENTAL METHODS OF ANALYSIS (BP 701 T)

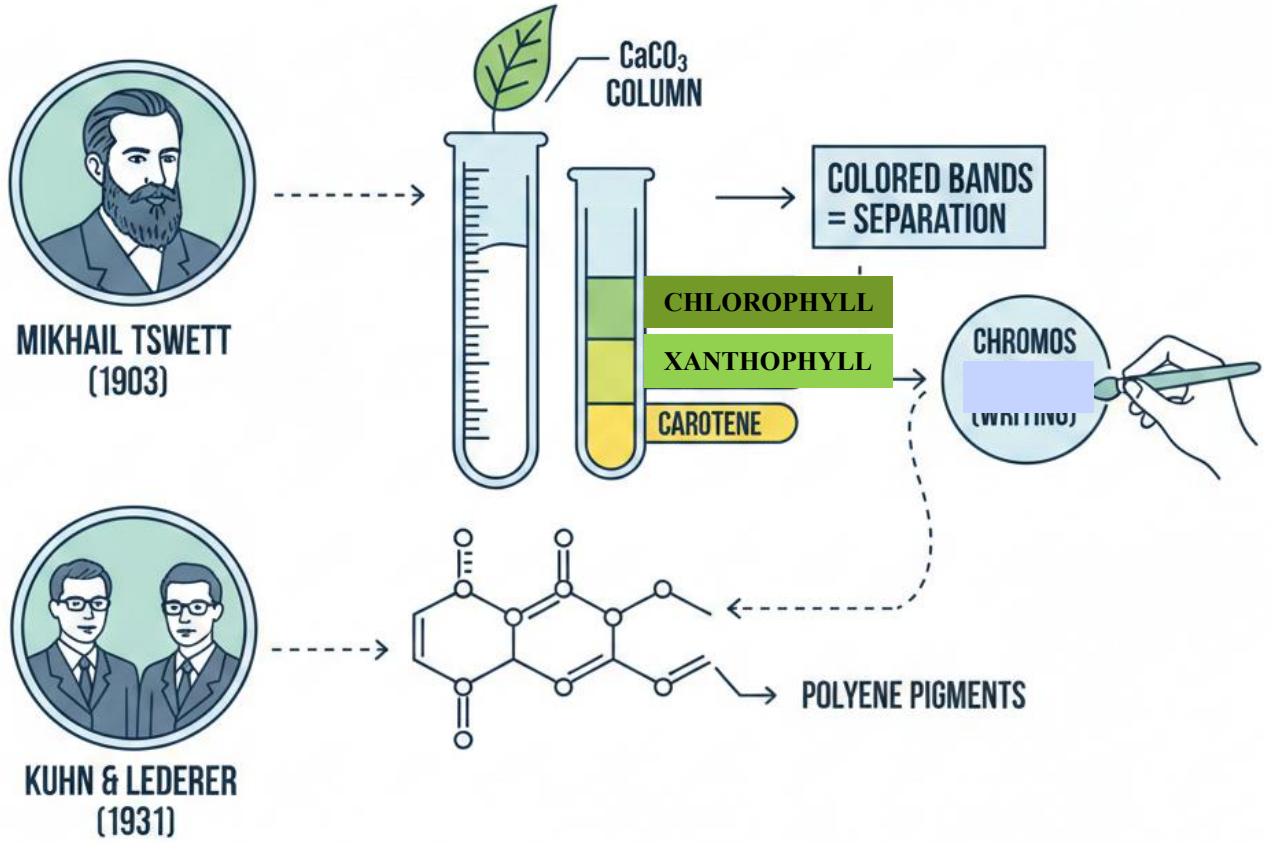
VII SEM/ IV YEAR

TOPIC 24: THIN LAYER CHROMATOGRAPHY- METHODOLOGY

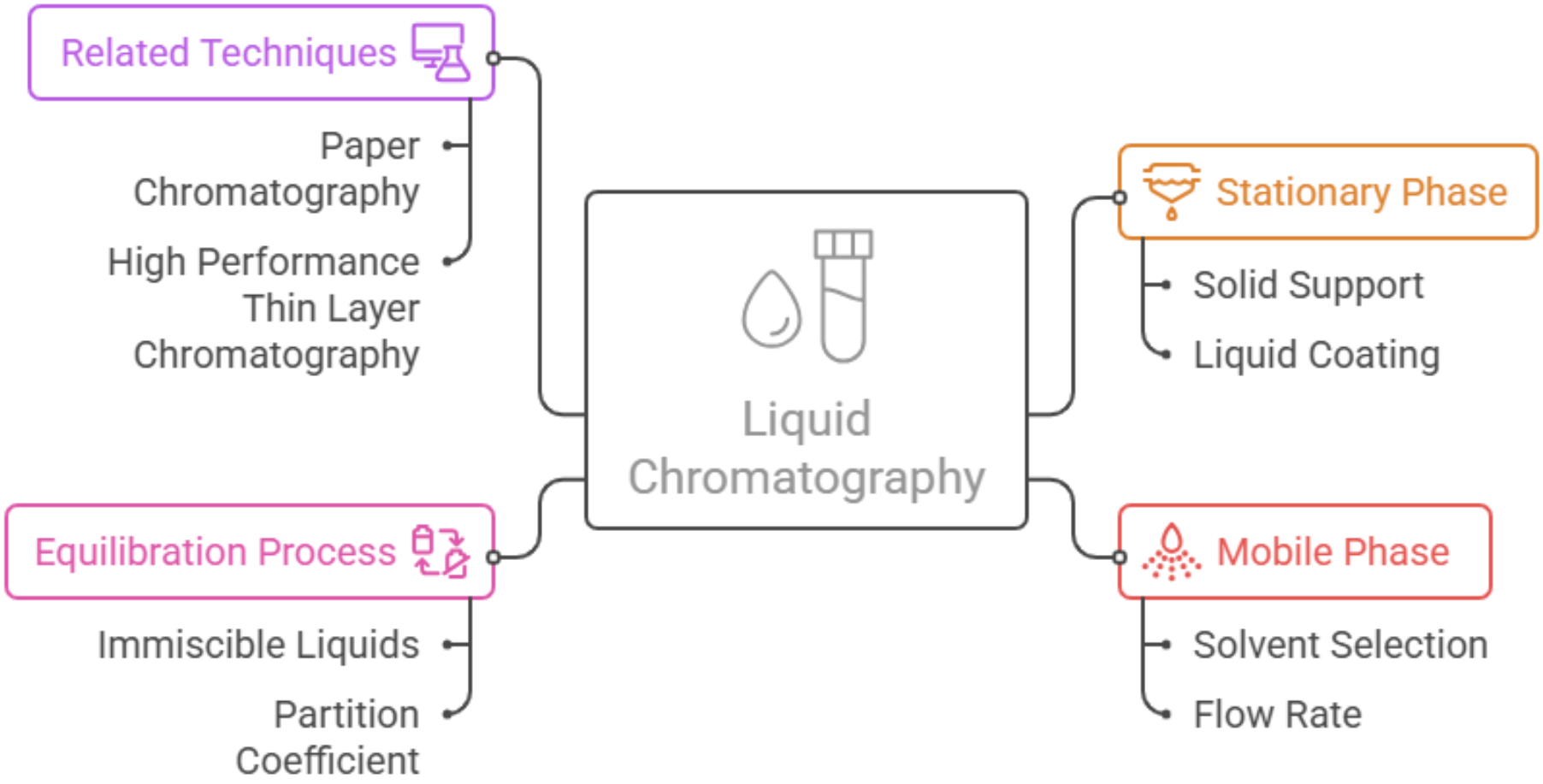
MINDMAP:


Thin Layer Chromatography
Methodology
Stationary Phase
Mobile Phase
Development Techniques
Detecting Agents
Applications
Separation
Identification
Impurity Testing

Introduction to Chromatography



Classification of TLC



History of TLC

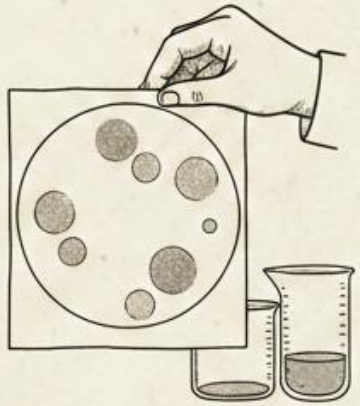
1938

Izmailov & Shrariber

Separated plant extracts using 2mm thick alumina layer on glass plate.

1944

Consden, Gordon & Martin



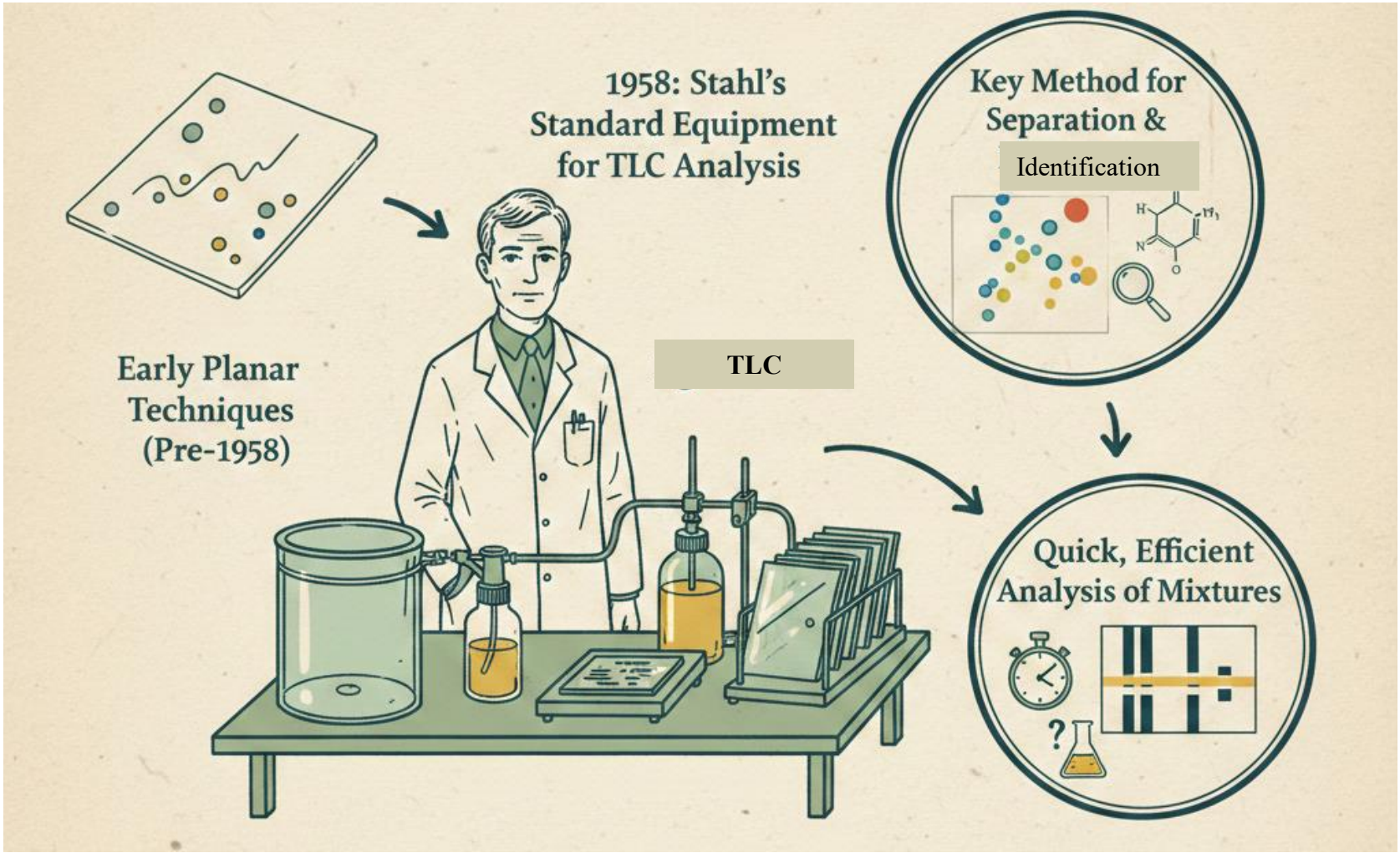
Used filter papers for amino acids.

1950

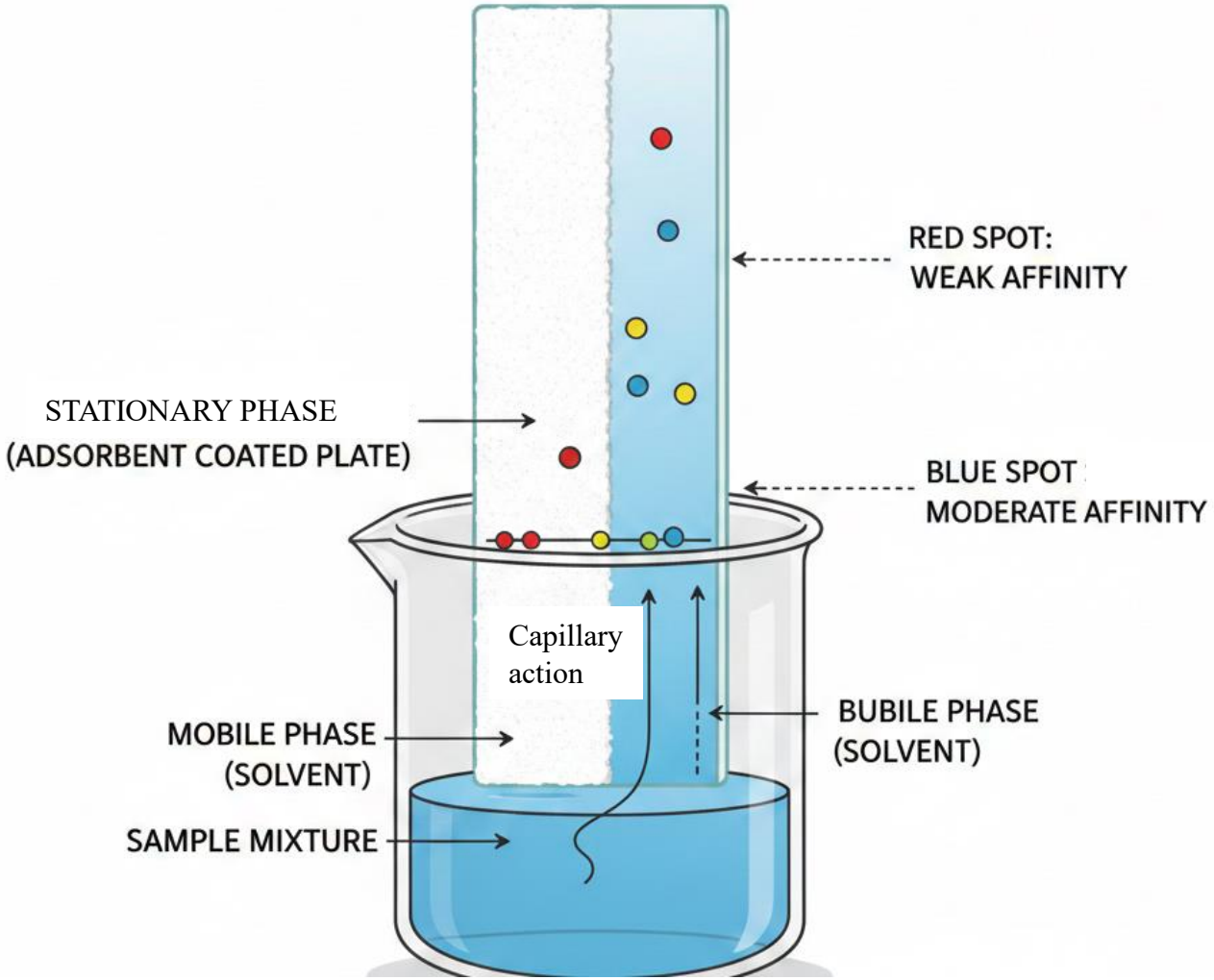
Kirchner

Identified terpenes on filter paper and glass fiber paper coated of alumina

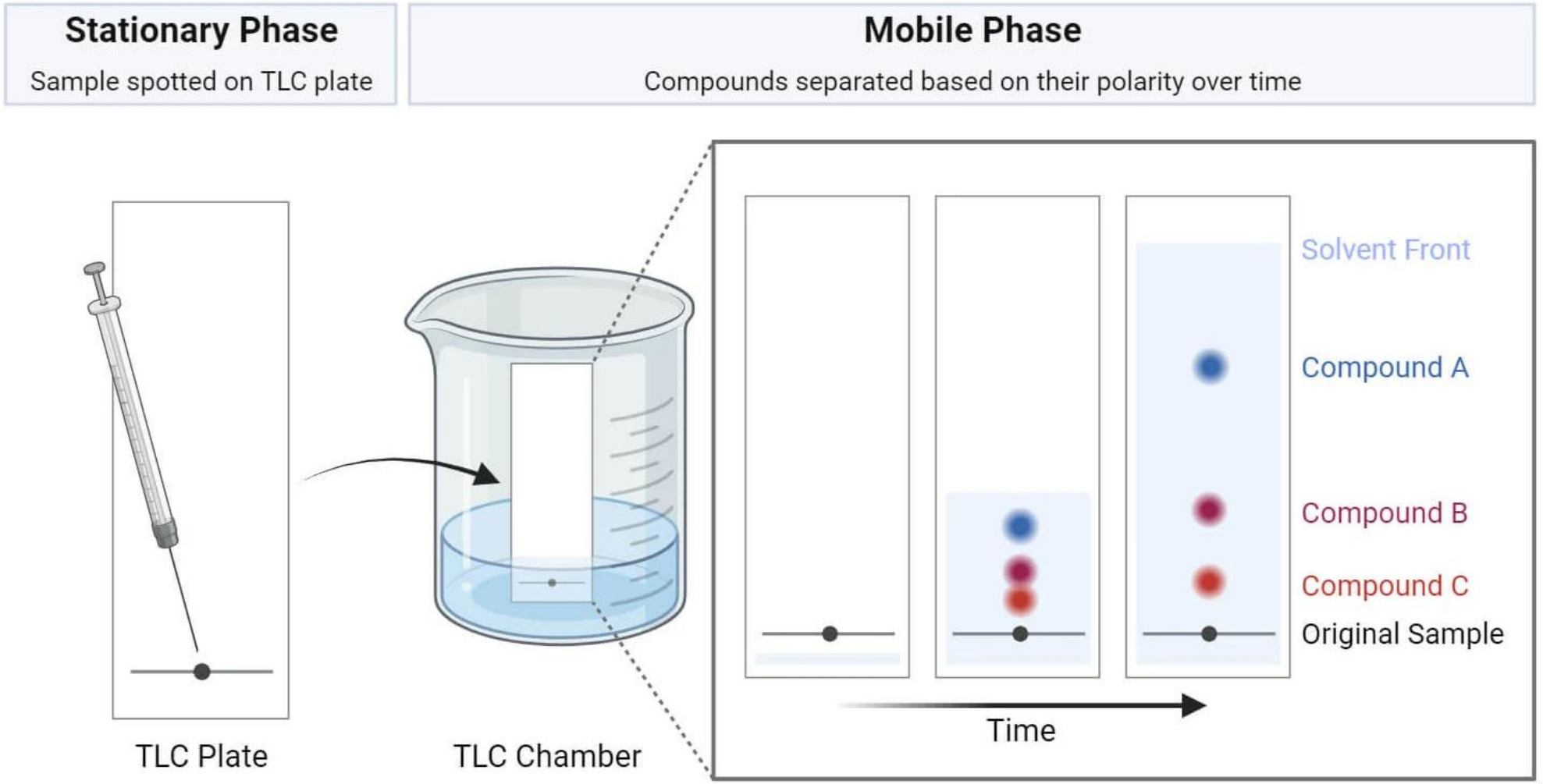
History of TLC: Stahl's contribution



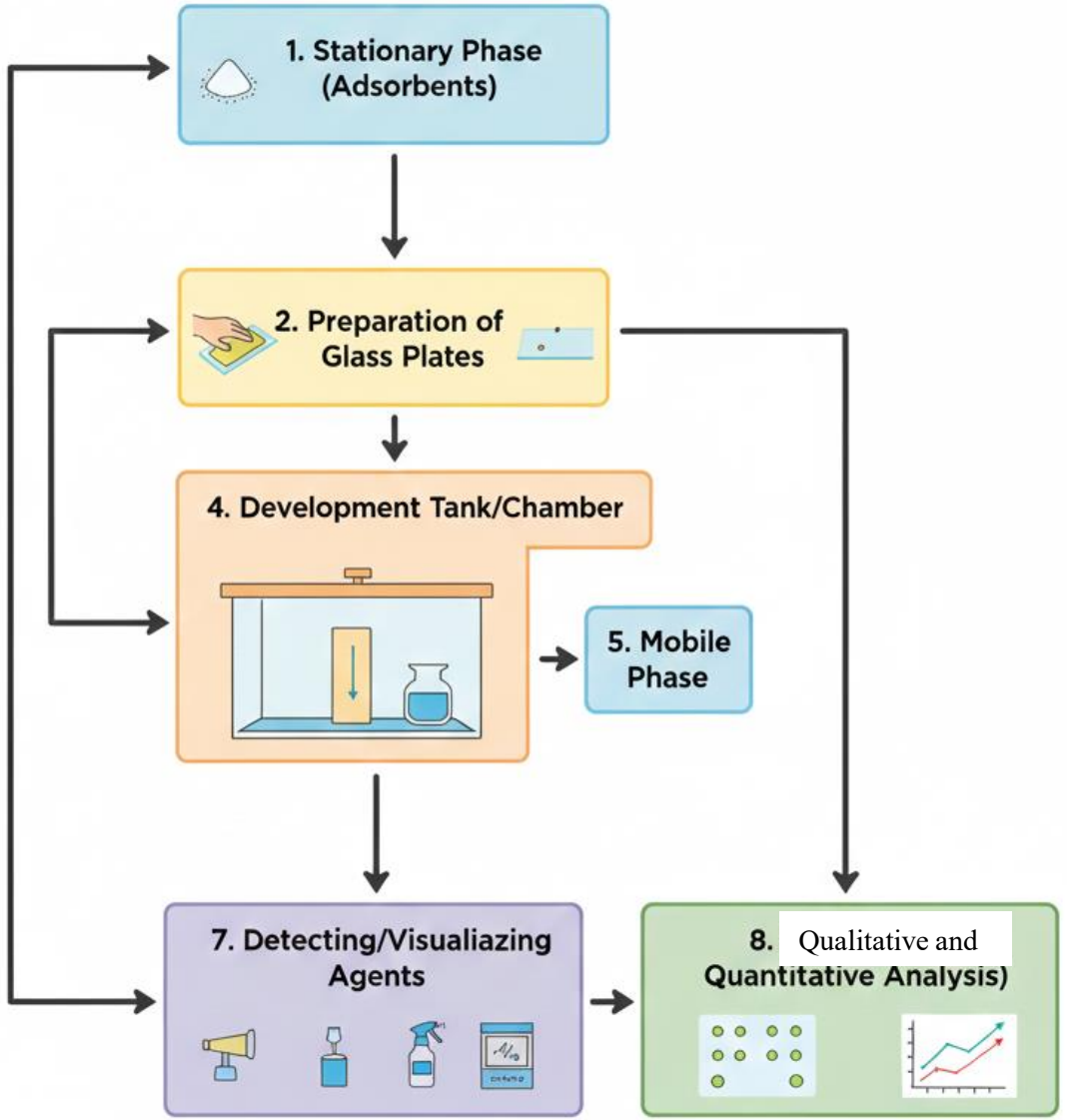
Definition of TLC



Principle of TLC



METHODOLOGY



Stationary Ph
(Adsorbents

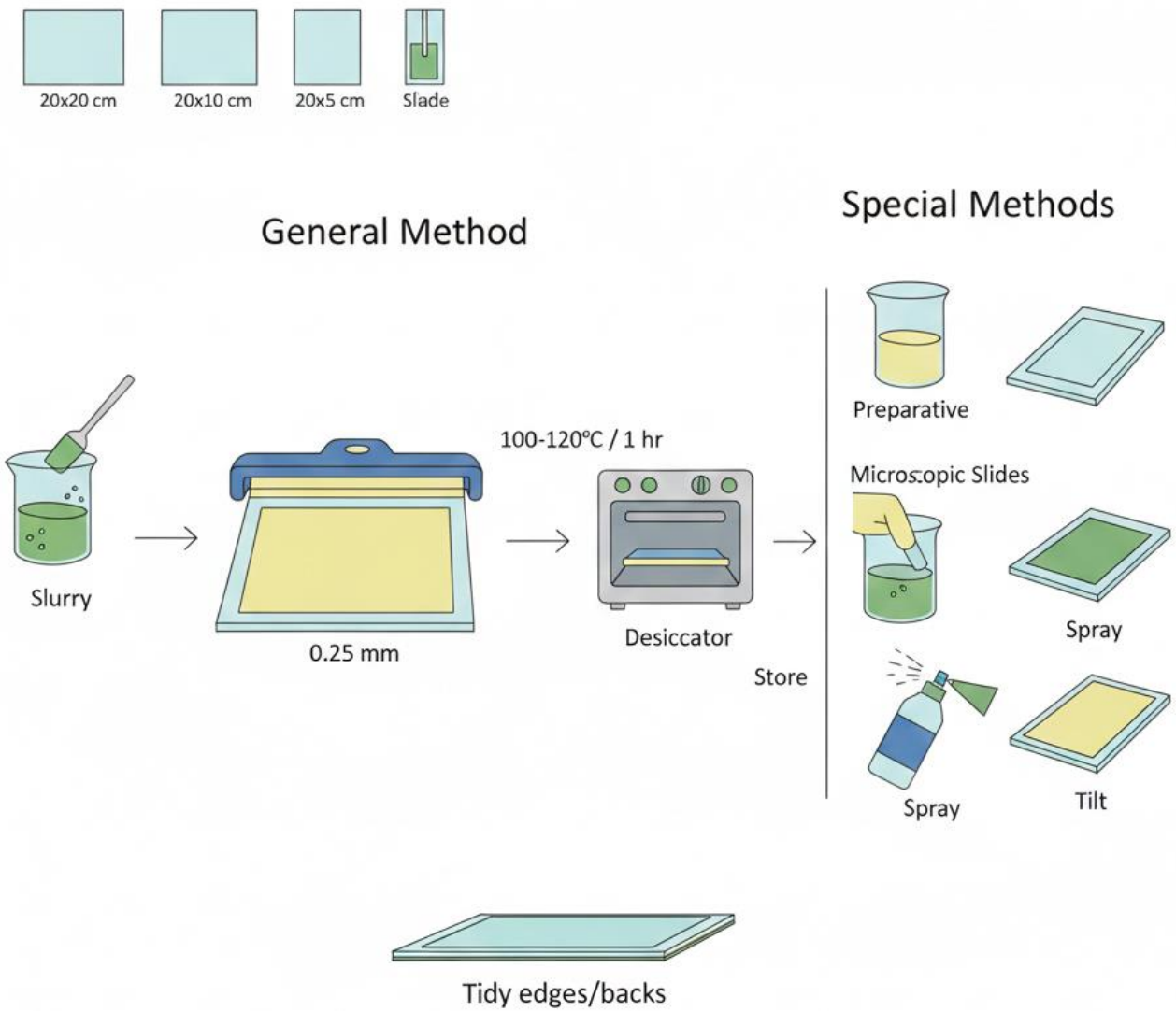
Preparation of
Plates.

Application of Sa

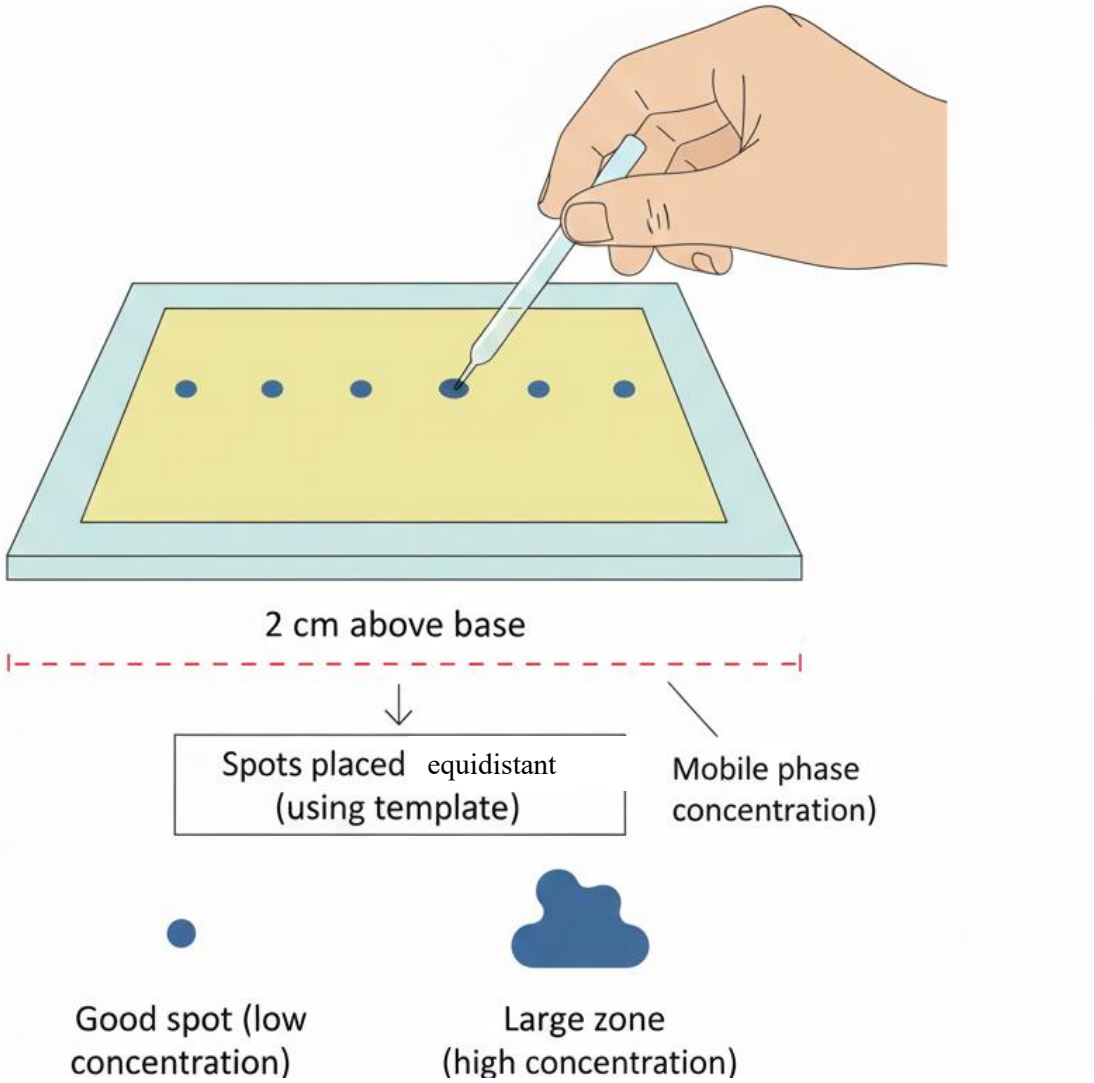
Stationary Phase (Adsorbents)

Name	Composition	Adsorbent:Water Ratio
Silicagel H	Silicagel without binder	1:1.5
Silicagel GF	Silicagel + Binder + Fluorescent indicator	1:2
Silicagel G	Silicagel + CaSO4 (gypsum)	1:2
Alumina (Neutral, Basic, Acidic)	Al2O3 without binder	1:1.1
Al2O3 G	Al2O3 + binder	1:2
Cellulose powder	Cellulose without binder	1:5
Cellulose powder	Cellulose with binder	1:6
Kieselguhr G	Diatomaceous earth + binder	1:2
Polyamide powder	Polyamide	1:9 (CHCl3:CH3OH=2:3)

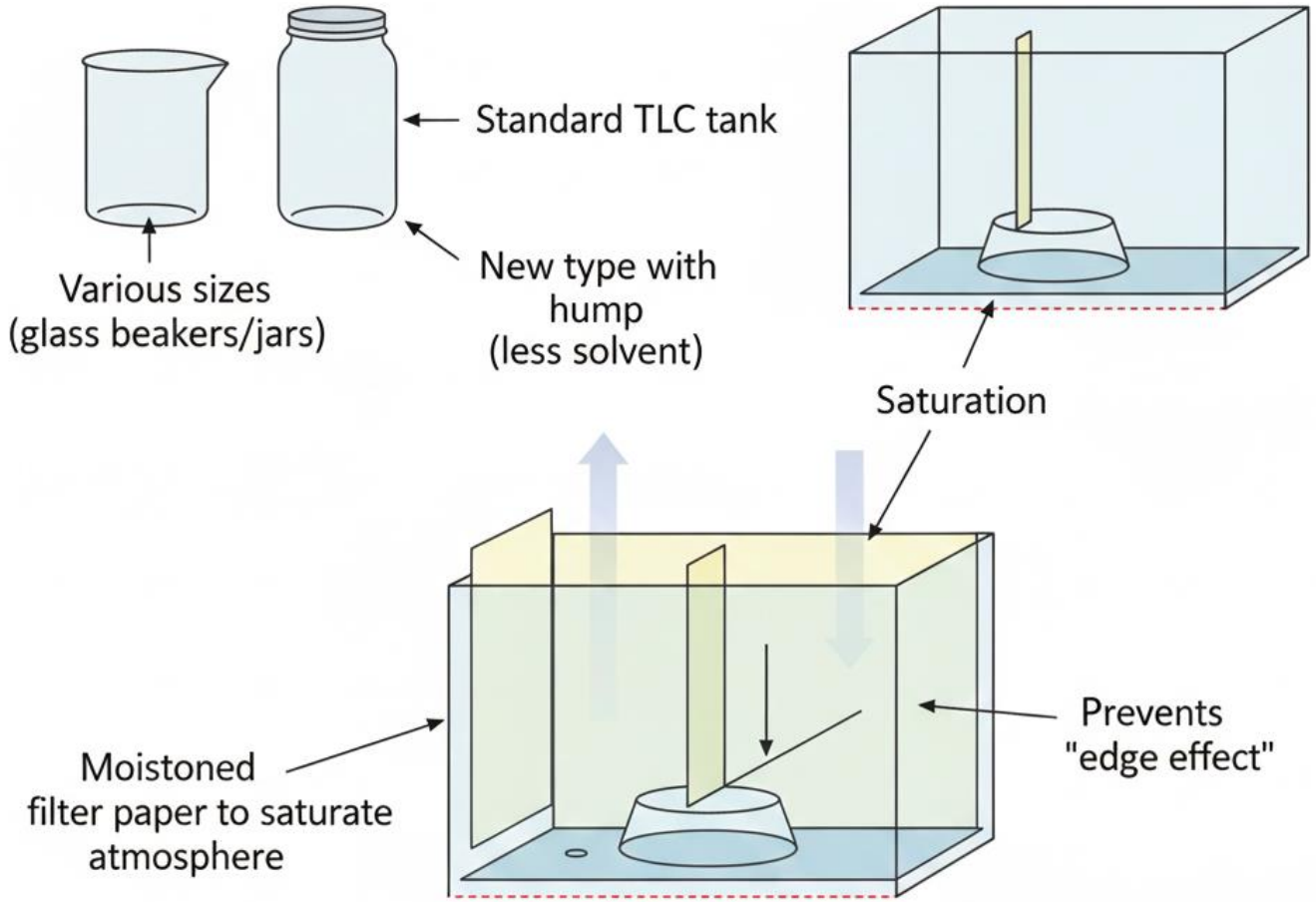
Preparation of Glass Plates



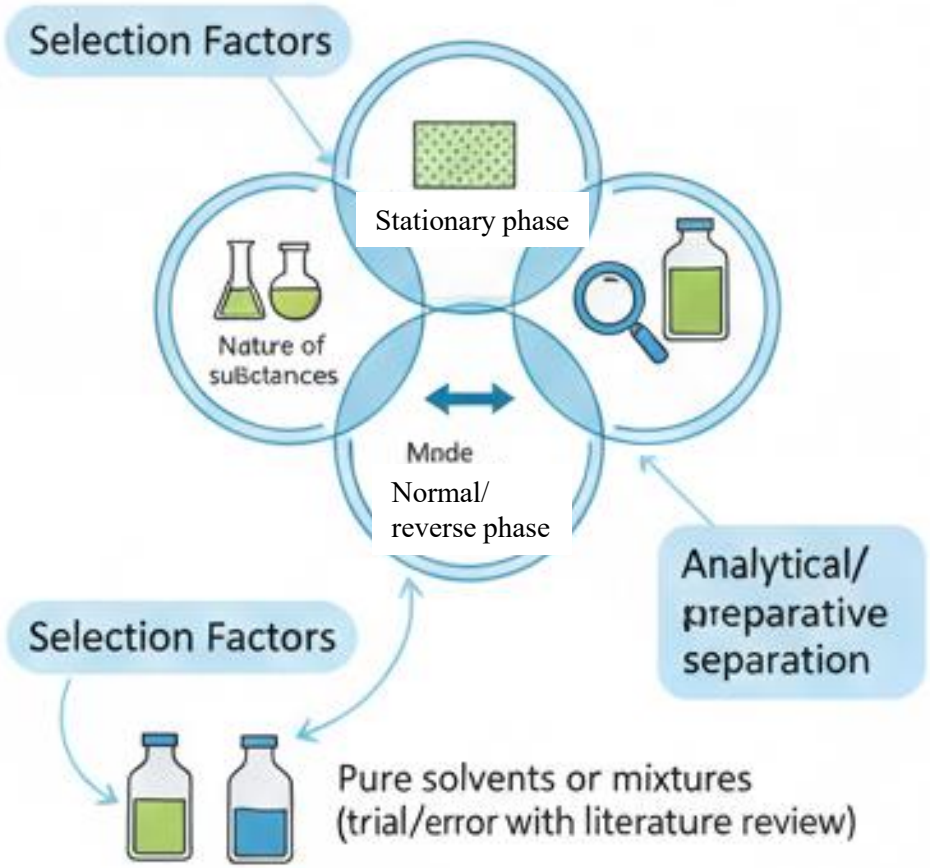
Application of Sample

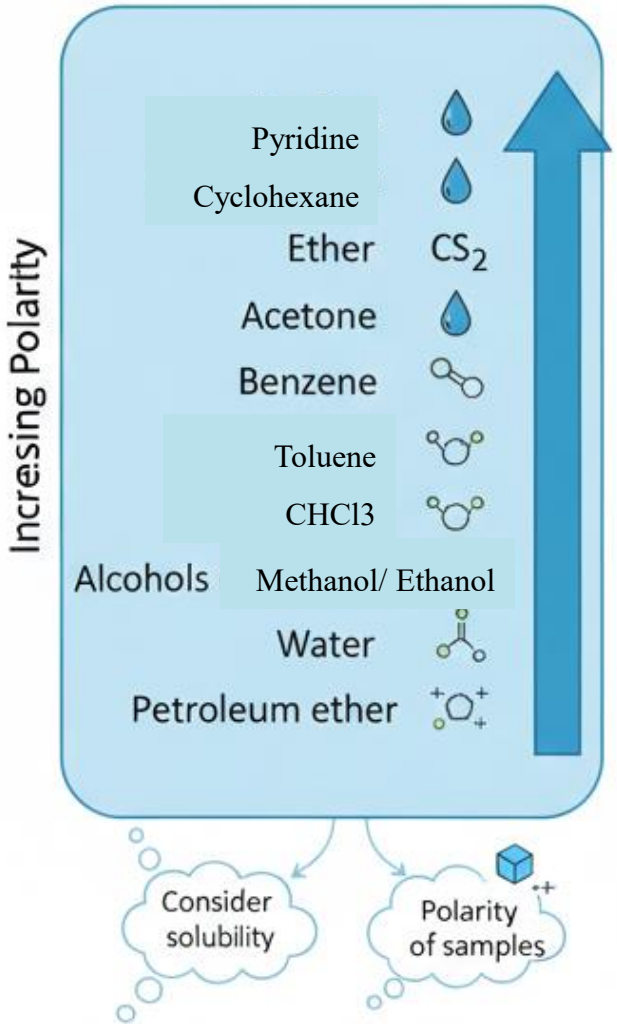


Development Tank/Chamber



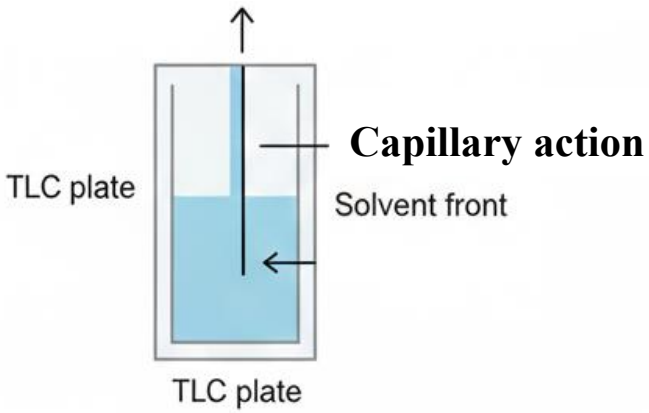
Mobile Phase



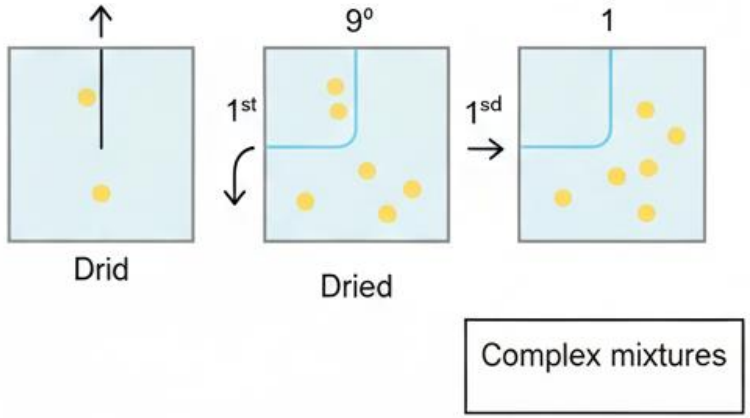


Development Techniques

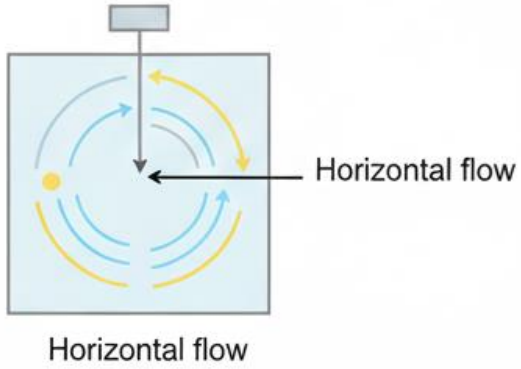
One dimensional Technique



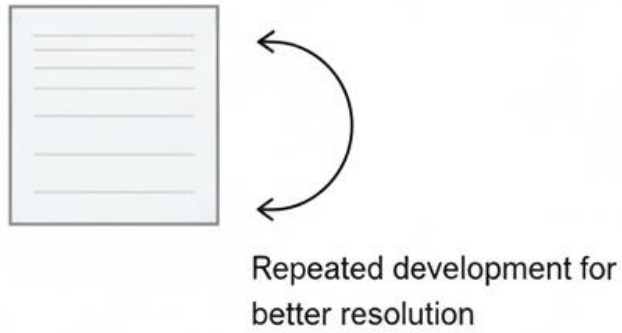
Two dimensional Technique



Horizontal



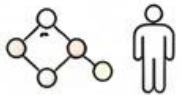
Multiple



Detecting/Visualizing Agents

Specific

$FeCL_3$ for phenolics



Ninhydrin for amino acids

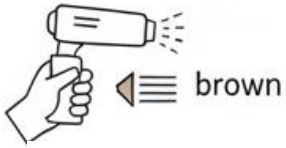
Dragendorff **For alkaloids**

2,4-DNP for **For aldehydes & ketones**

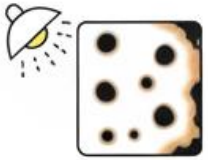
Non specific

Iodine chamber

H_2SO_4 spray

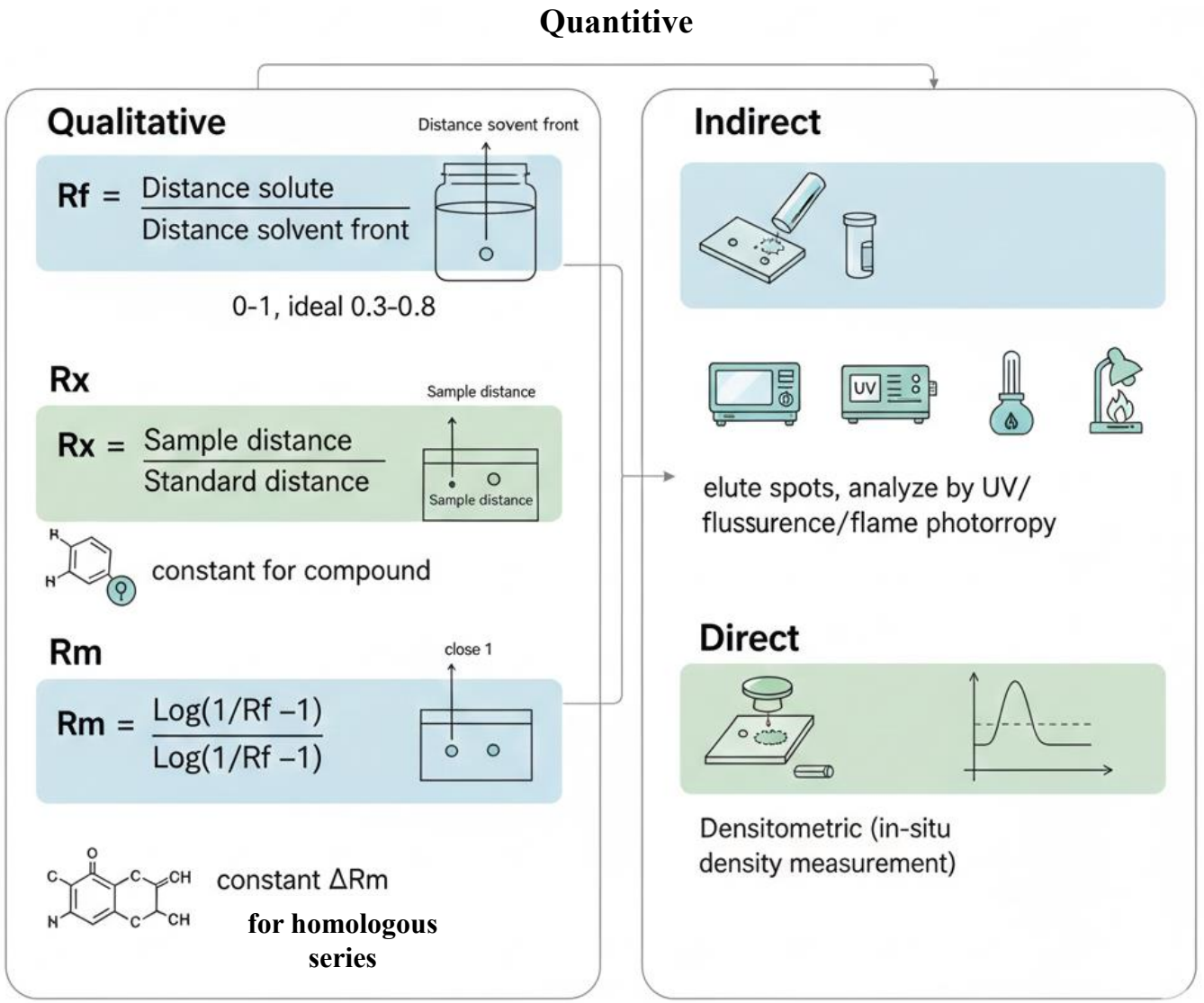


Fluorescent phase

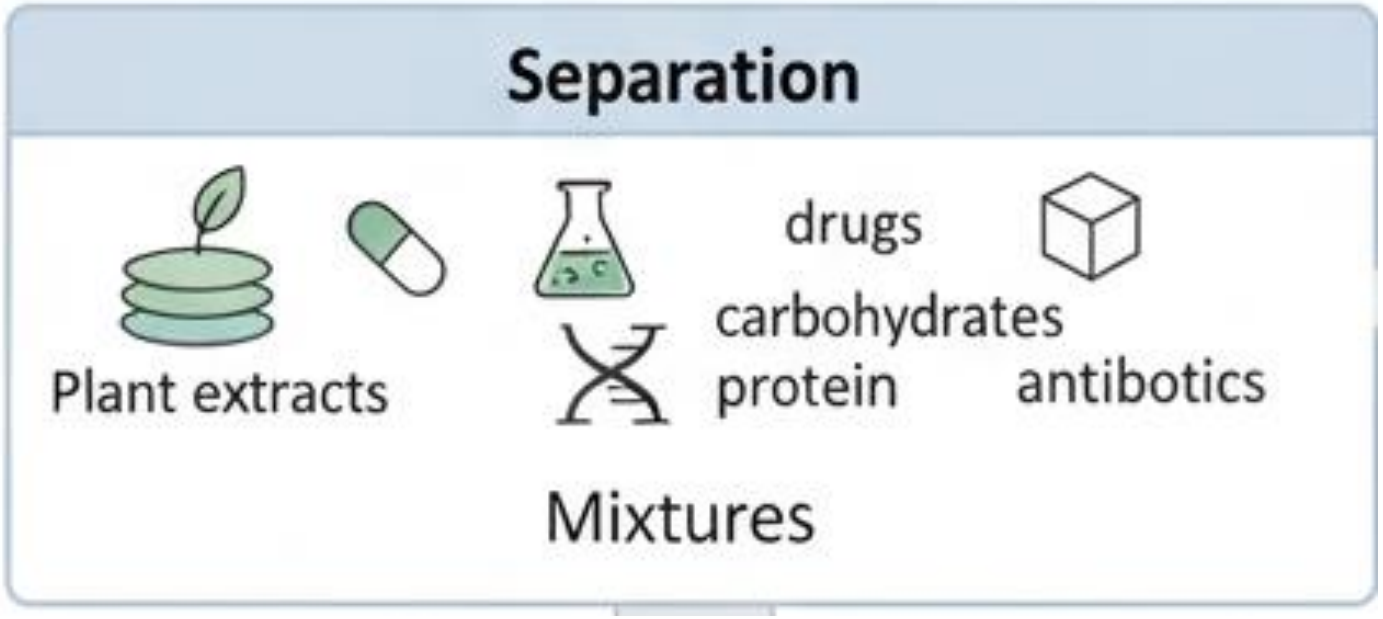


dark spots under UV

Qualitative and Quantitative Analysis



Applications



Advantages & Limitations

Advantages

- Fast
- Fast
- Simple
- Visual
- High selatclity
- Cheap



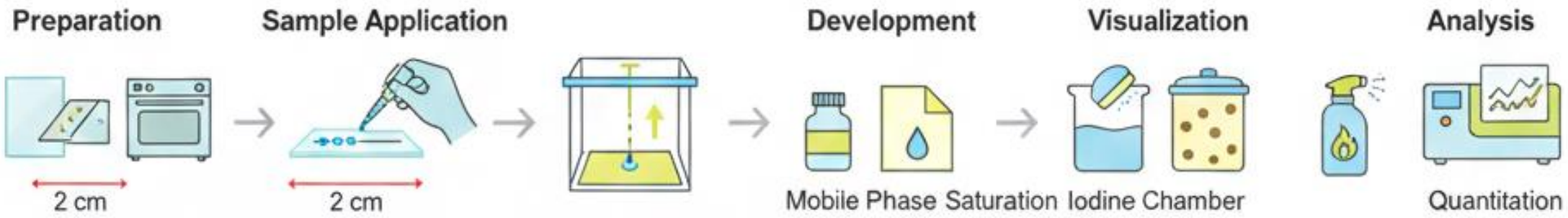

Limitations

1. Limited resolution


- Manual handling

- Not as quantitative as HPLC

Summary



Advantages

- Fast, Simple, Cheap

Limitations

- Resolution,
- Manual

$Rf = b/a$

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Assessment

1. The most commonly used stationary phase material in TLC is:

1. The most commonly used stationary phase material in TLC is:

a) Calcium Carboratn ($CaCO_3$) b) Silica Gel (with Silanol groups)

c) Alumina Al_2O_3 d) Celluose Powder

Assessment

2. In TLC, the stationary phase is typically a:

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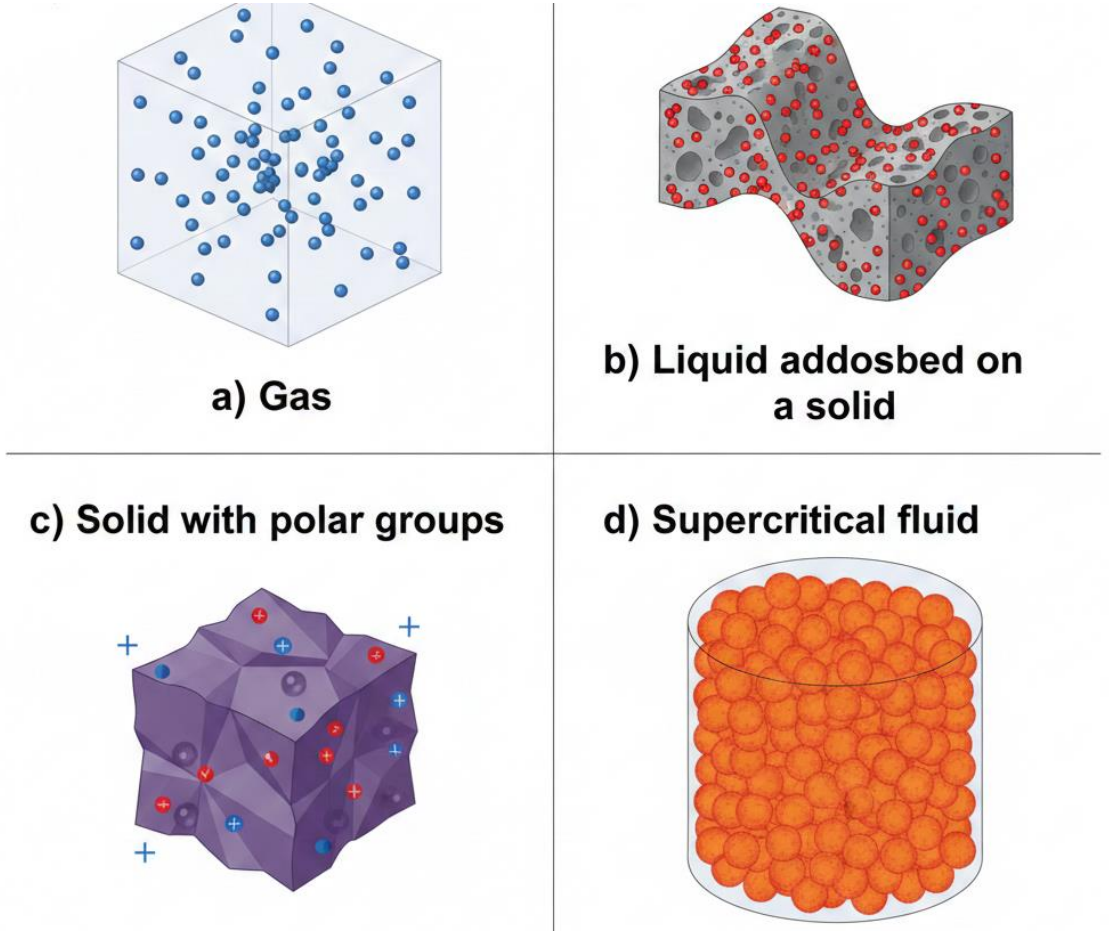

Assessment

3. In TLC, the mobile phase moves through the stationary phase by:

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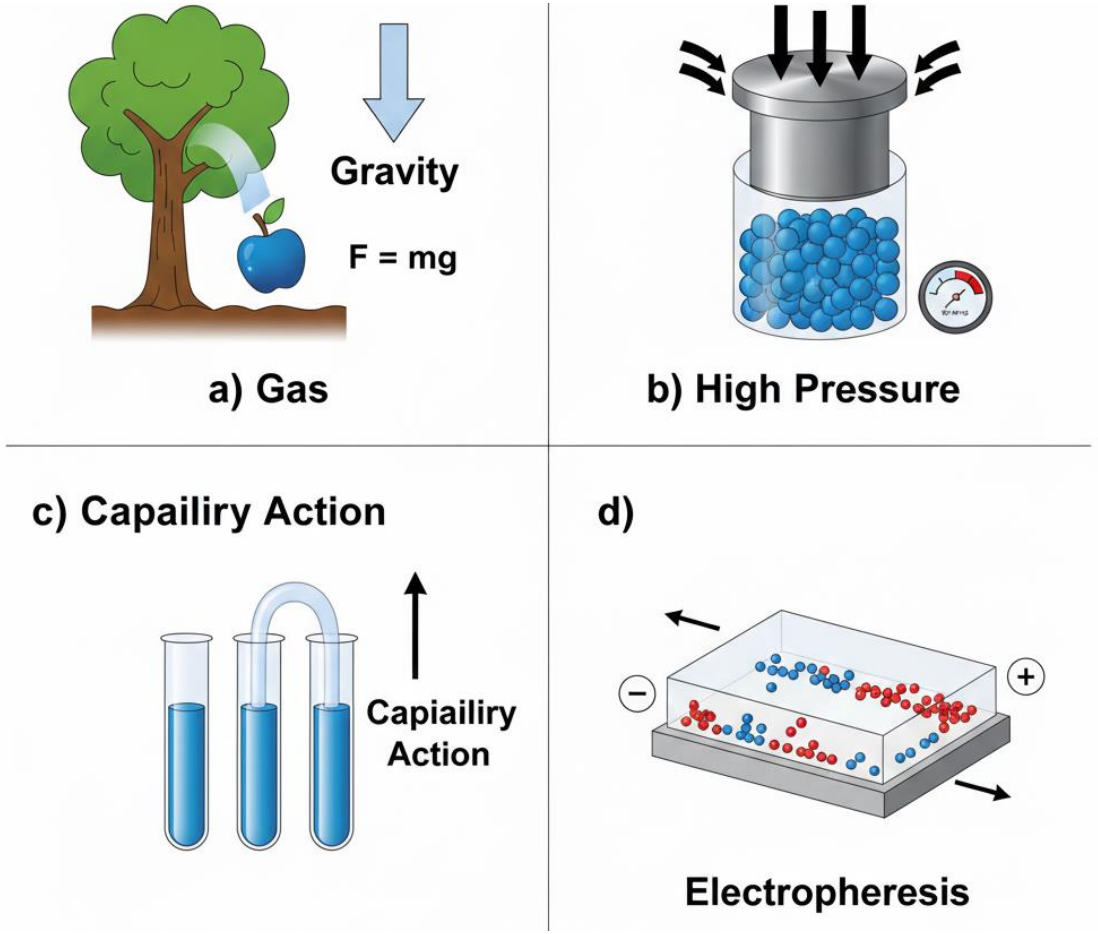

References

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Thank you!