

SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

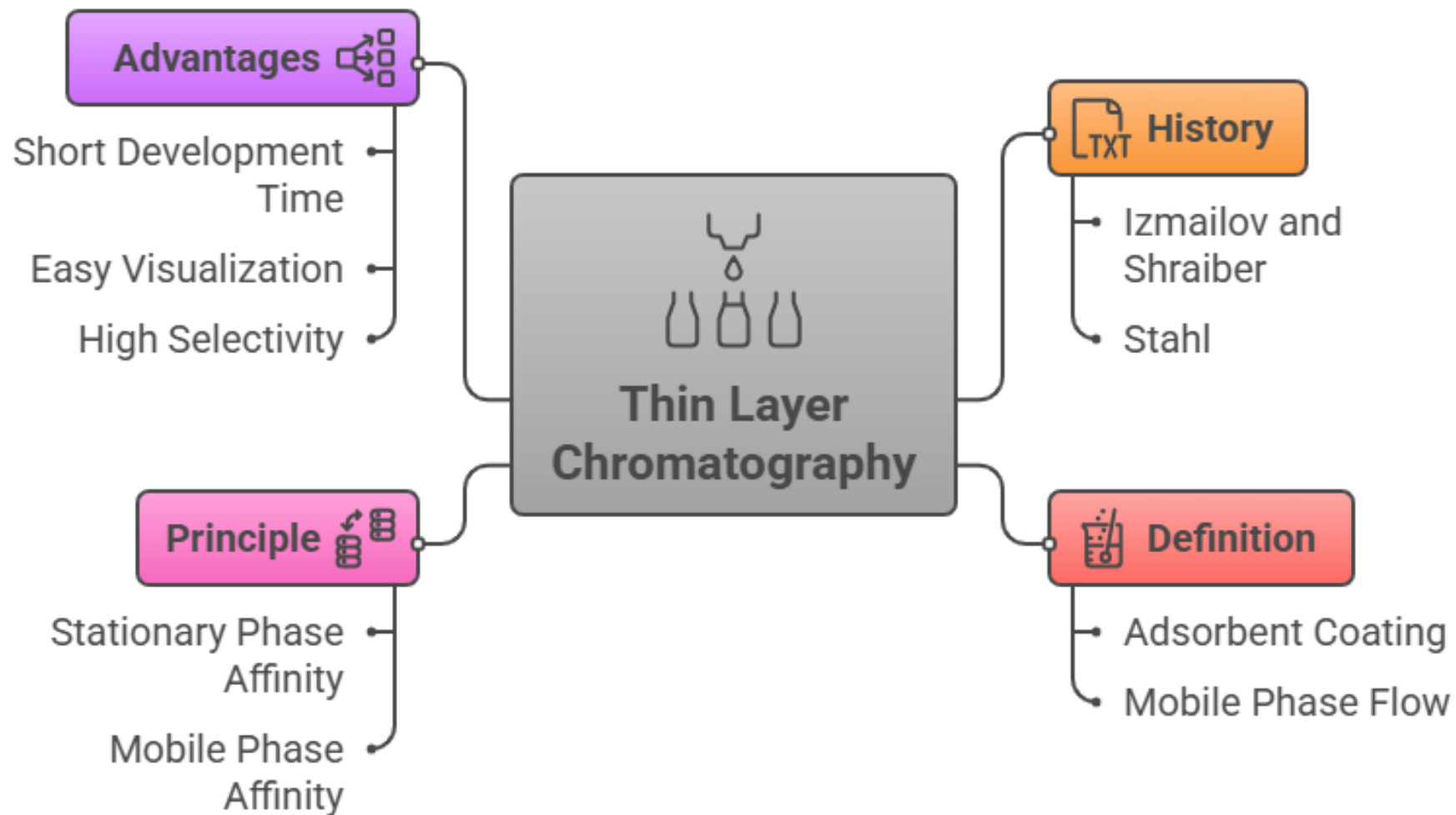
Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai
Approved by Pharmacy Council of India, New Delhi.
Coimbatore -641035

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

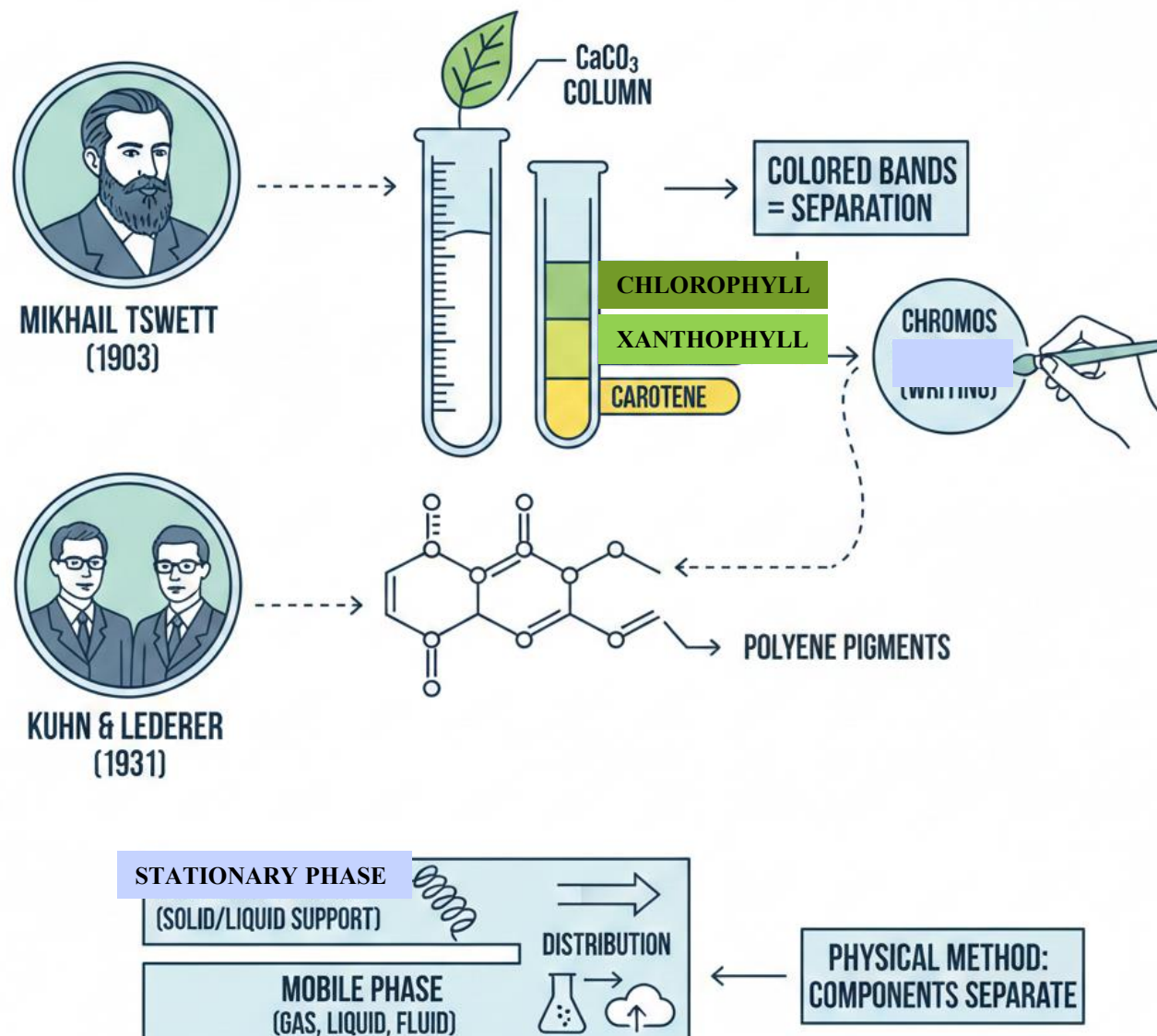
VII SEM/ IV YEAR

TOPIC 23: THIN LAYER CHROMATOGRAPHY

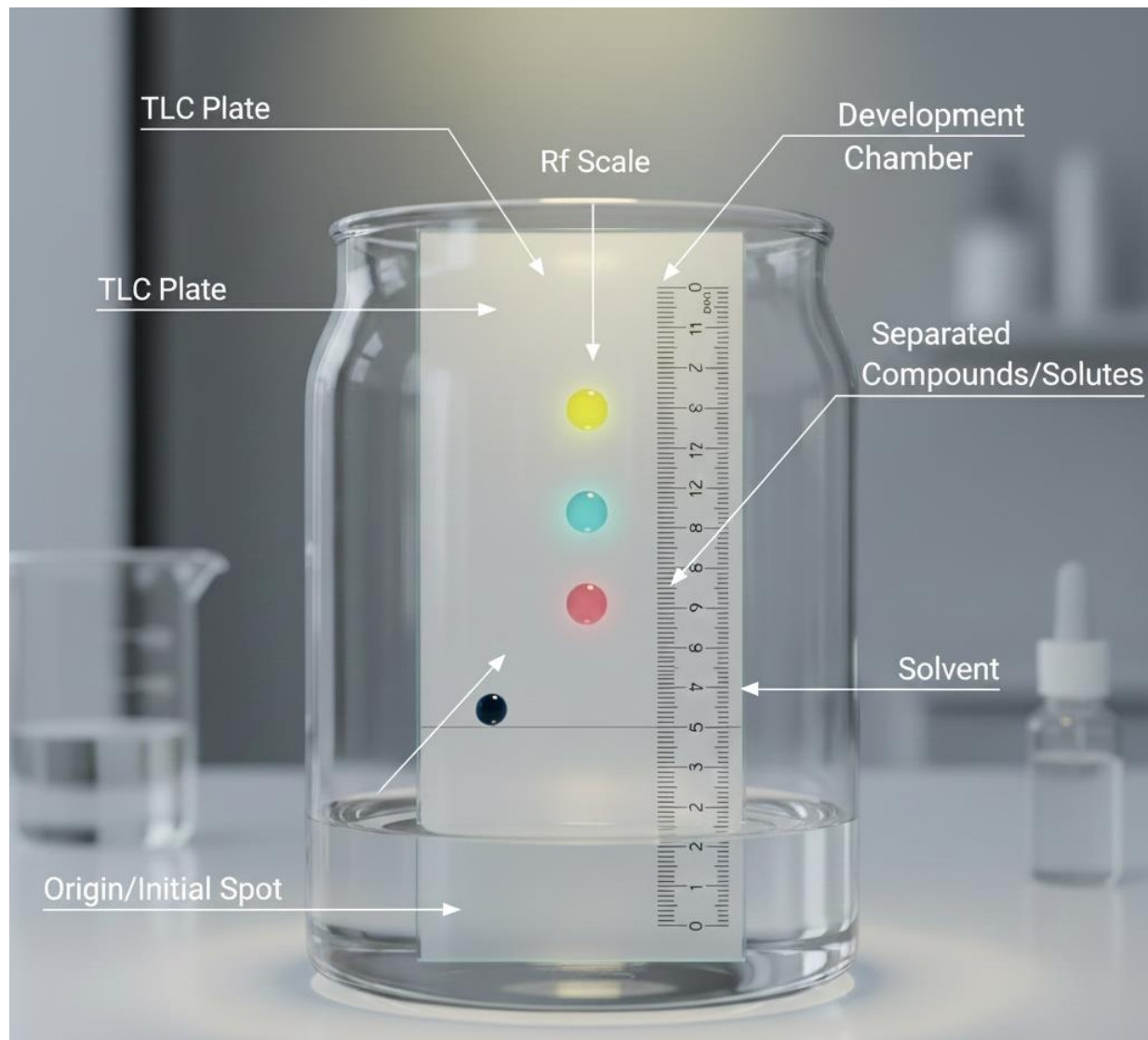
MINDMAP:



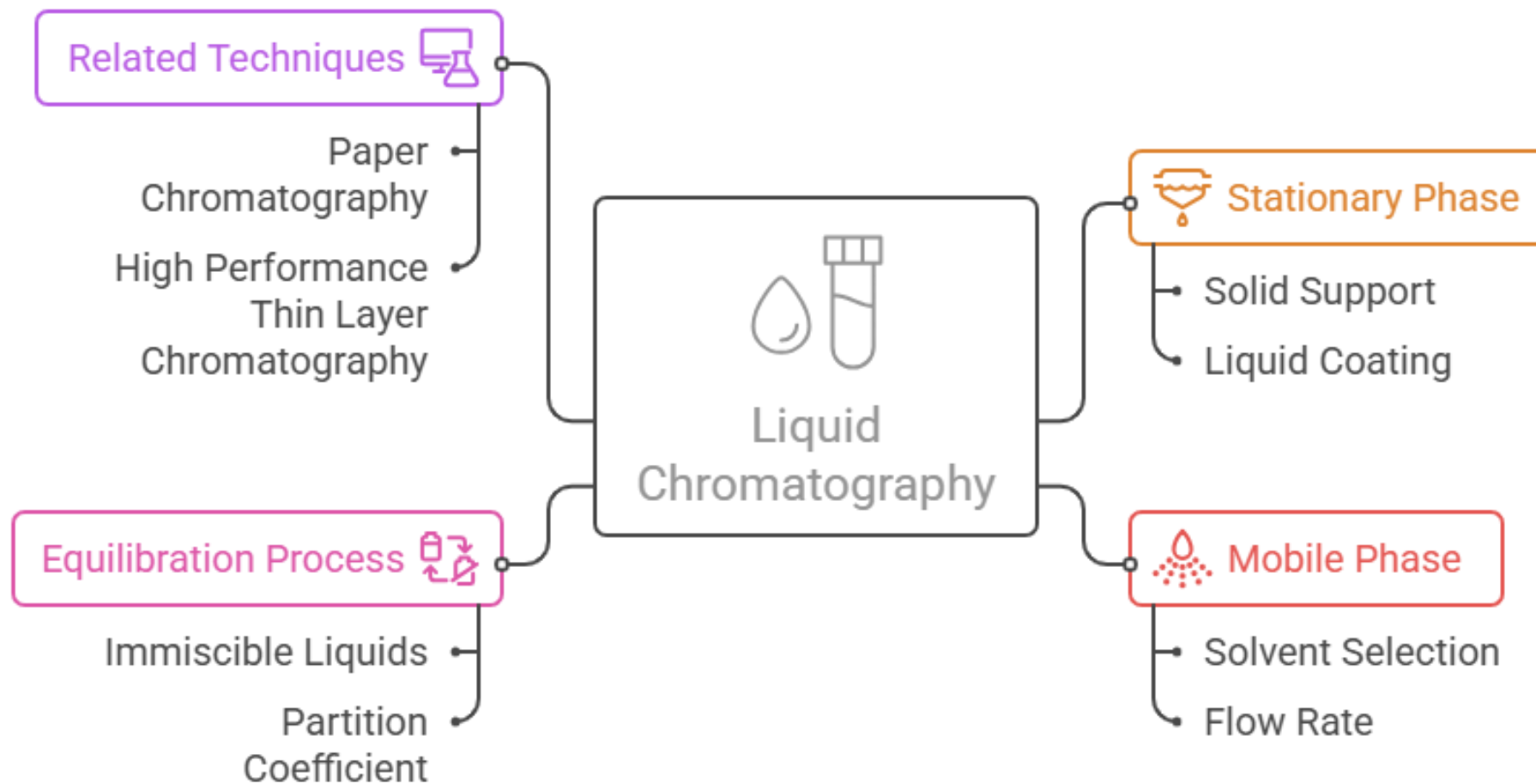
Introduction to Chromatography



Thin Layer Chromatography



Classification of TLC



History of TLC

1938

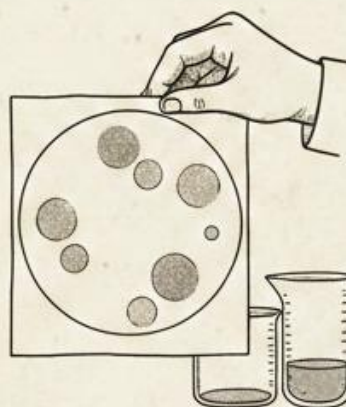
Izmailov & Shrariber



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

1944

Consden, Gordon & Martin



Used filter papers for
amino acids.

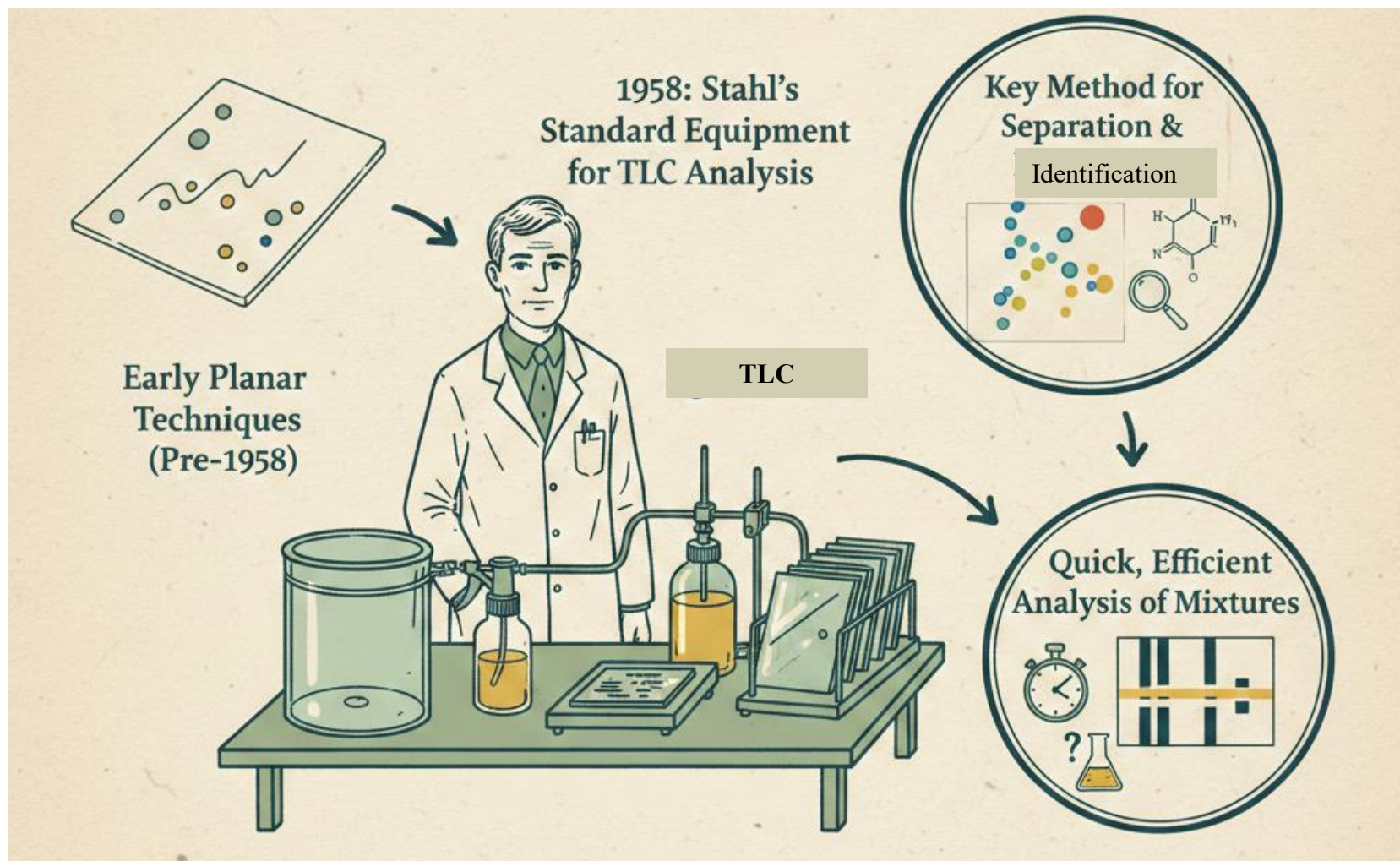
1950

Kirchner

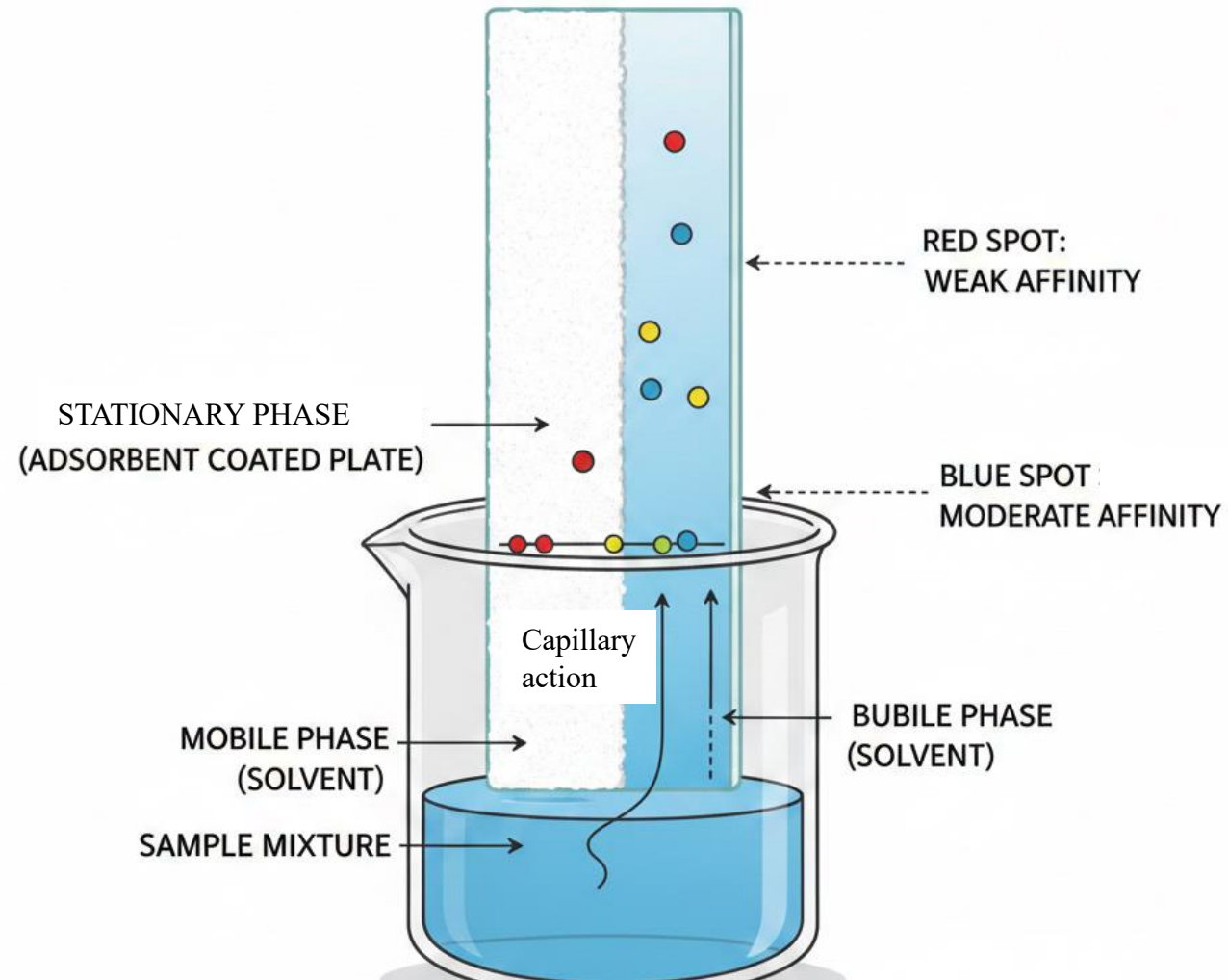


Identified terpenes on filter
paper and glass fiber paper
coated of alumina

History of TLC: Stahl's contribution



Definition of TLC



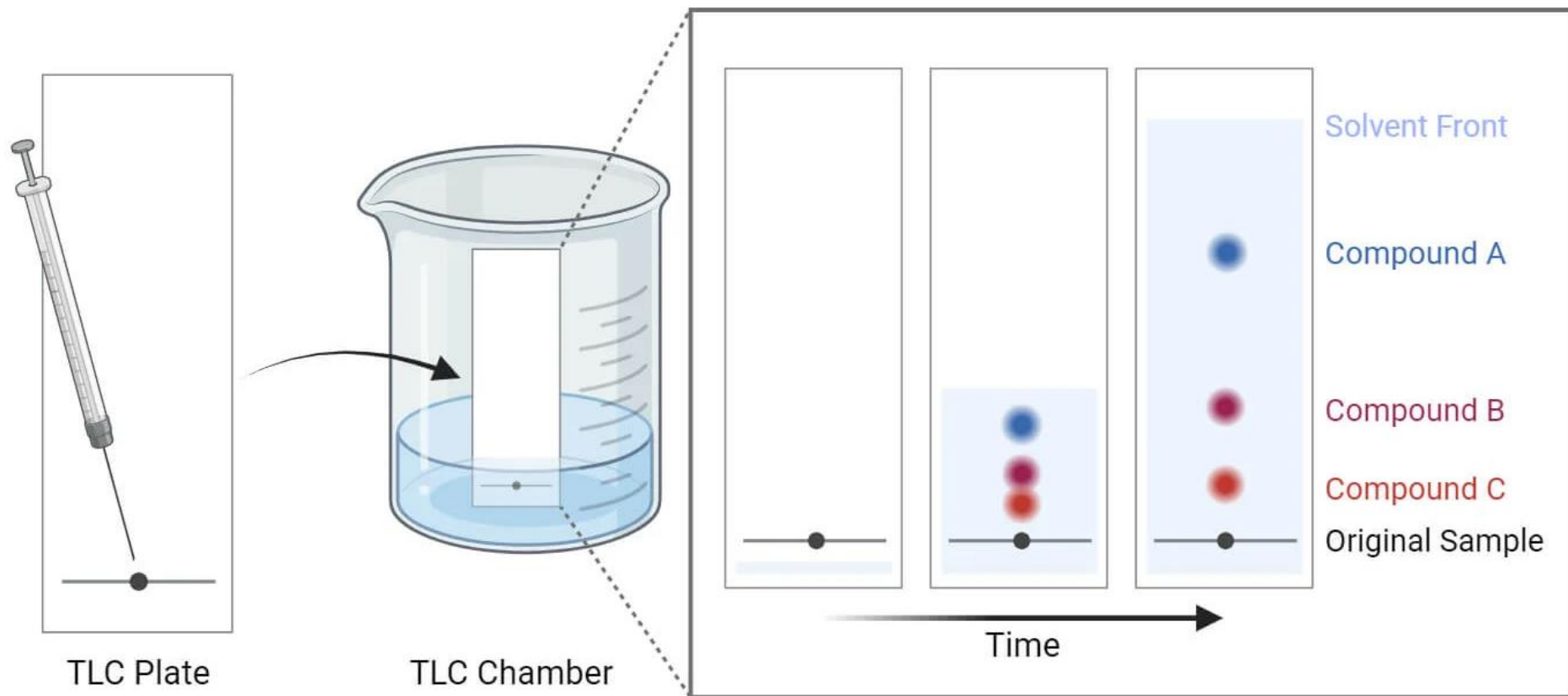
Principle of TLC

Stationary Phase

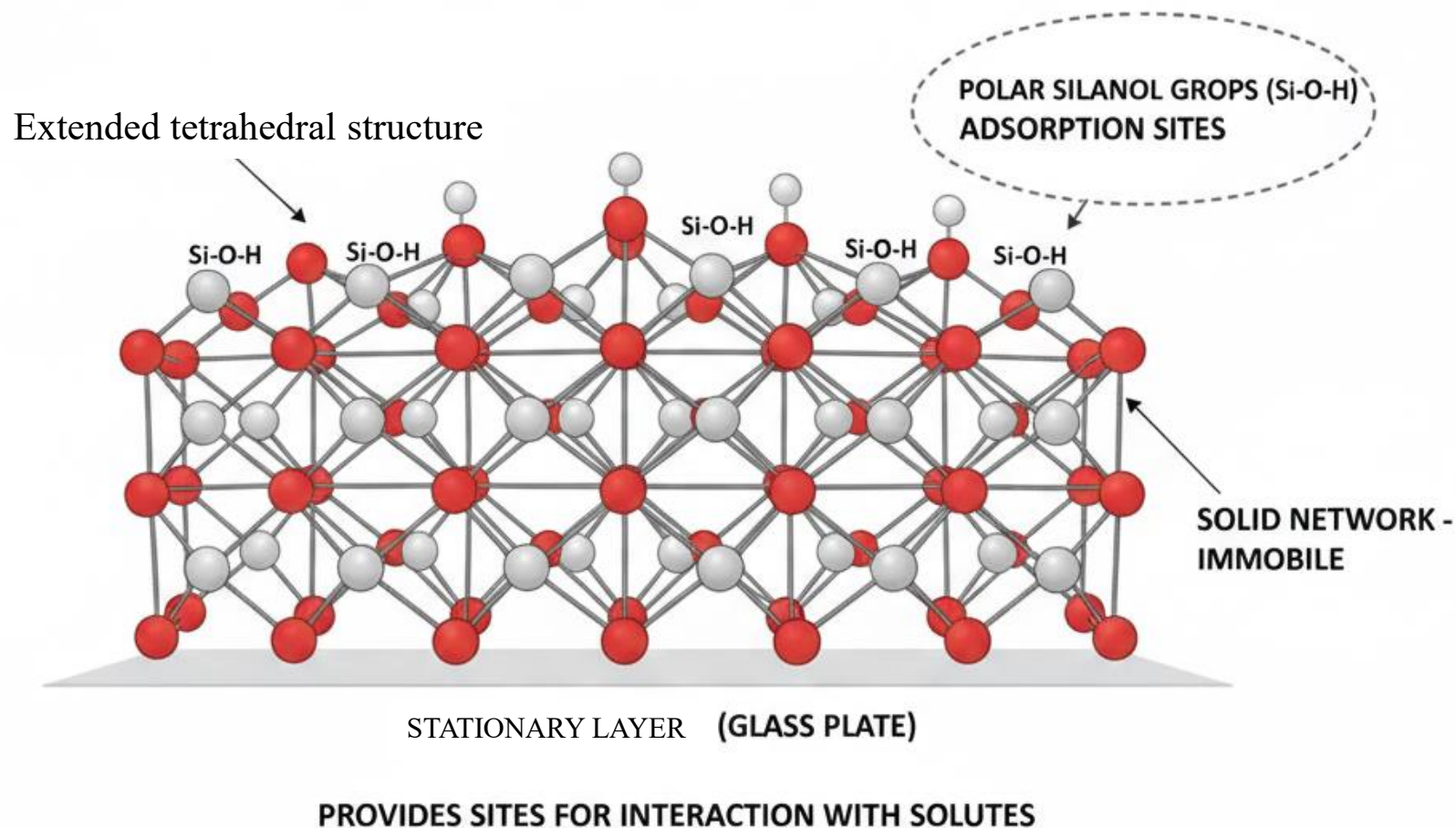
Sample spotted on TLC plate

Mobile Phase

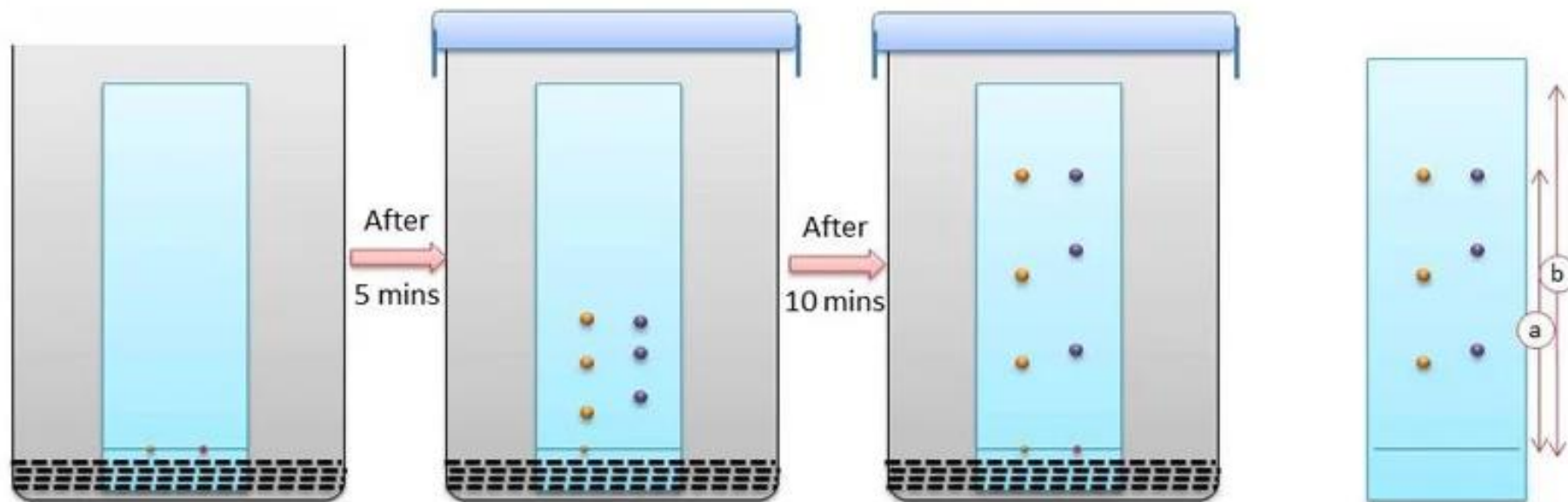
Compounds separated based on their polarity over time



Stationary Phase: Silica (SiO_2)

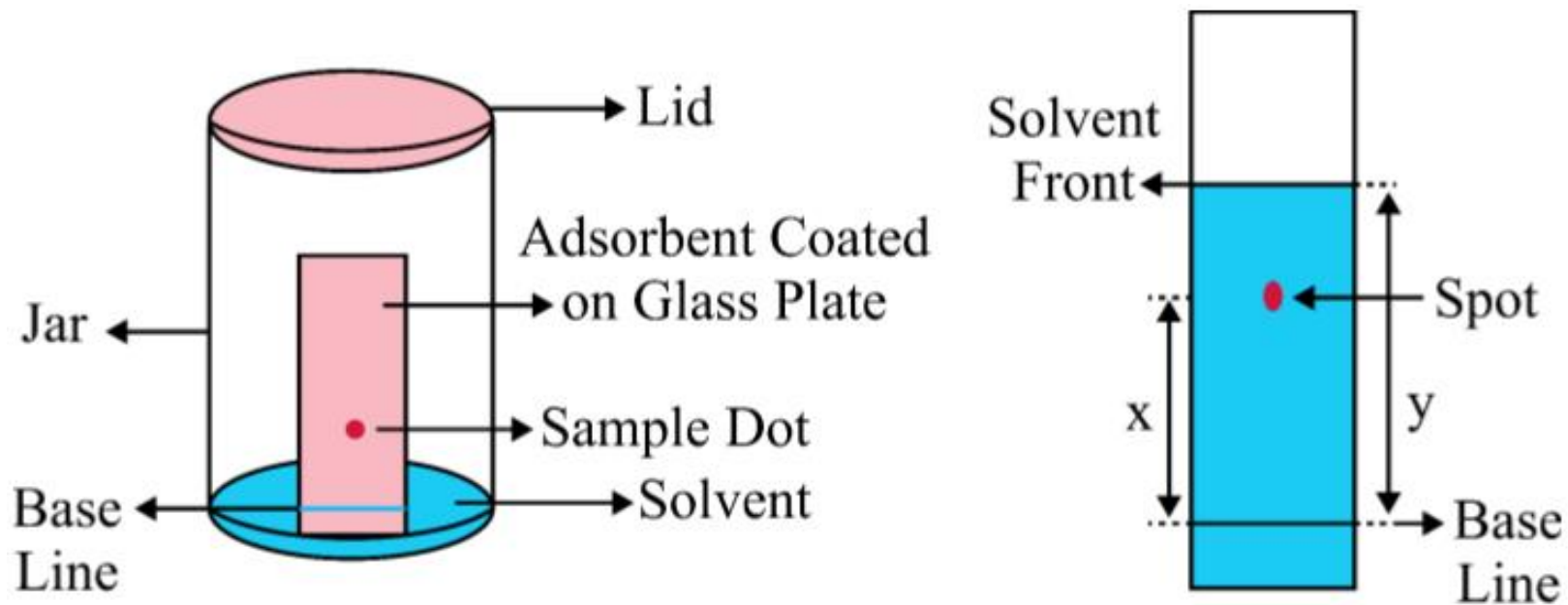


Stationary Phase



$$\begin{aligned} R_f &= \frac{\text{distance travelled by the component}}{\text{distance travelled by the solvent}} \\ &= \frac{a}{b} \end{aligned}$$

Process Visualization



Advantages of TLC



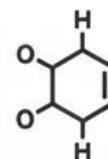
**RAPID & SIMPLE.
SHORT TIME.**



EASY VISUALIZATION



**HIGH SELECTIVITY.
ISOLATES COMPOUNDS**



**SAMPLE PURITY
CHECK**



**SAMPLE PURITY
CHECK**



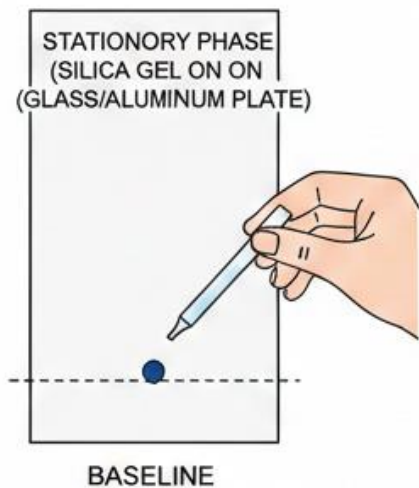
**COST-EFFECTIVE.
CHEAPER**



**MORE EFFICIENT
THAN PAPER**

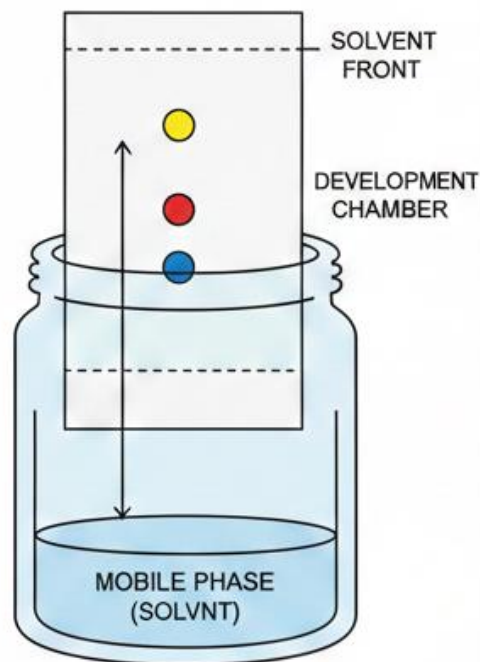
Summary

1. SPOTTING



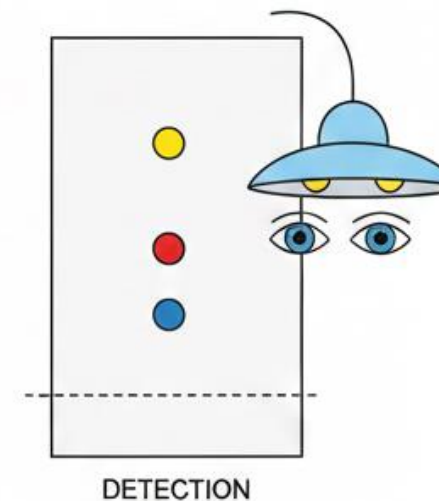
Sample mixture applied as a spot on on the baseline.

2. SEPARATION



Solvent moves up, separating components based and the polarity. Non-polar compounds travel further.

3. DETECTION



Components visualized (UV light, staining).

$$R_f = \frac{\text{Distance traveled by spot}}{\text{Rf value calcuvent front}}$$

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 Carbonate (CaCO_3)

b) Silica Gel (with Silanol groups)



c) Alumina Al_2O_3

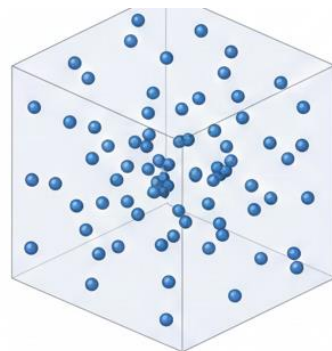
d) Cellulose Powder

Assessment

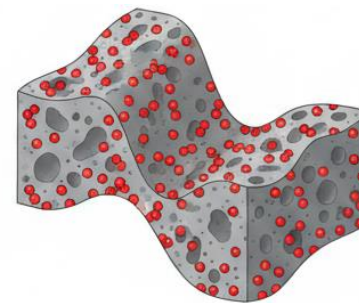
2. In TLC, the stationary phase is typically a:



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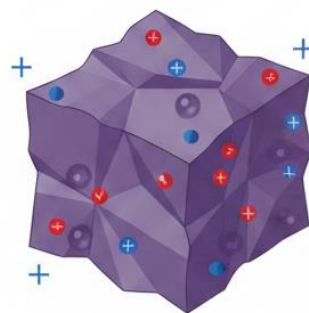


a) Gas

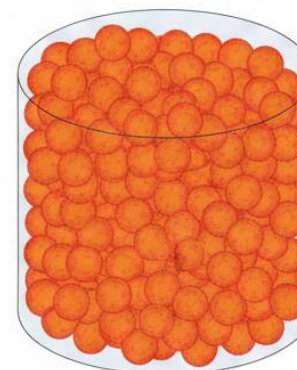


**b) Liquid addosbed on
a solid**

c) Solid with polar groups



d) Supercritical fluid

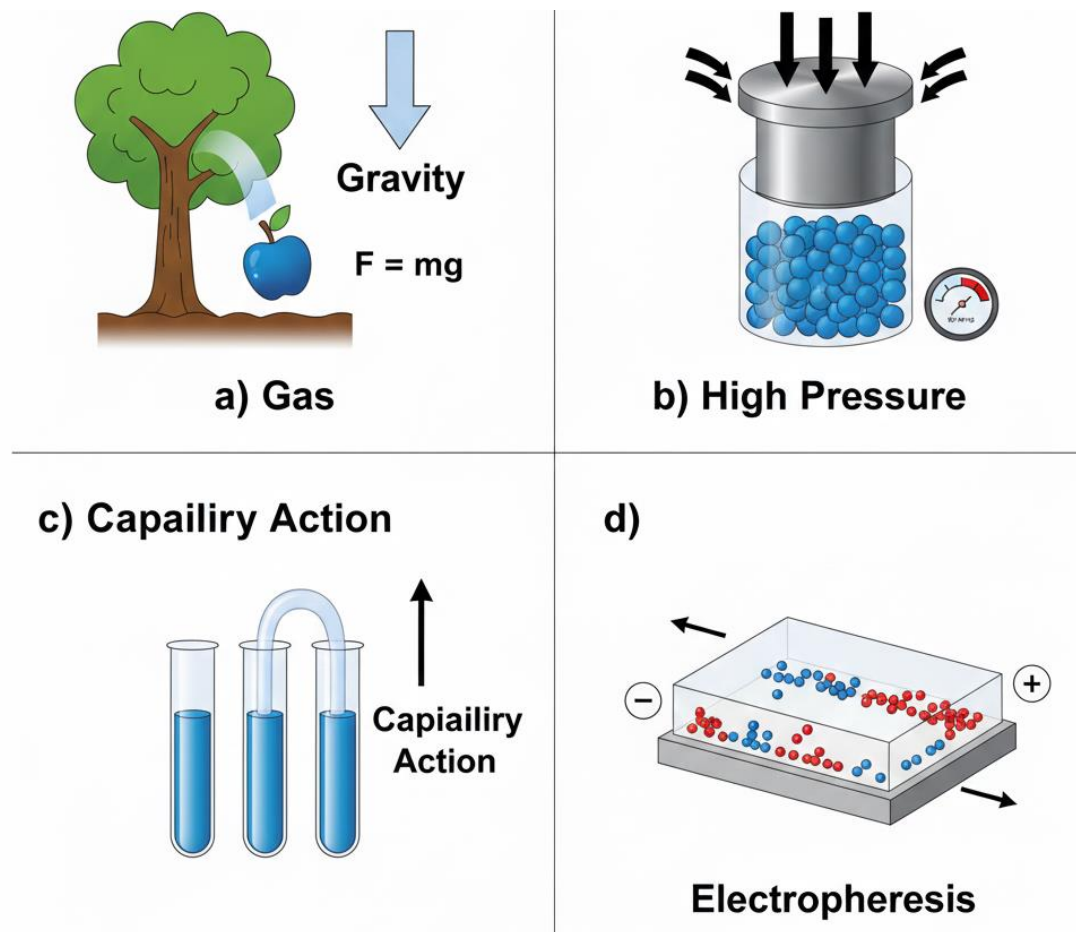


Assessment

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



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



References

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*Thank
you!*