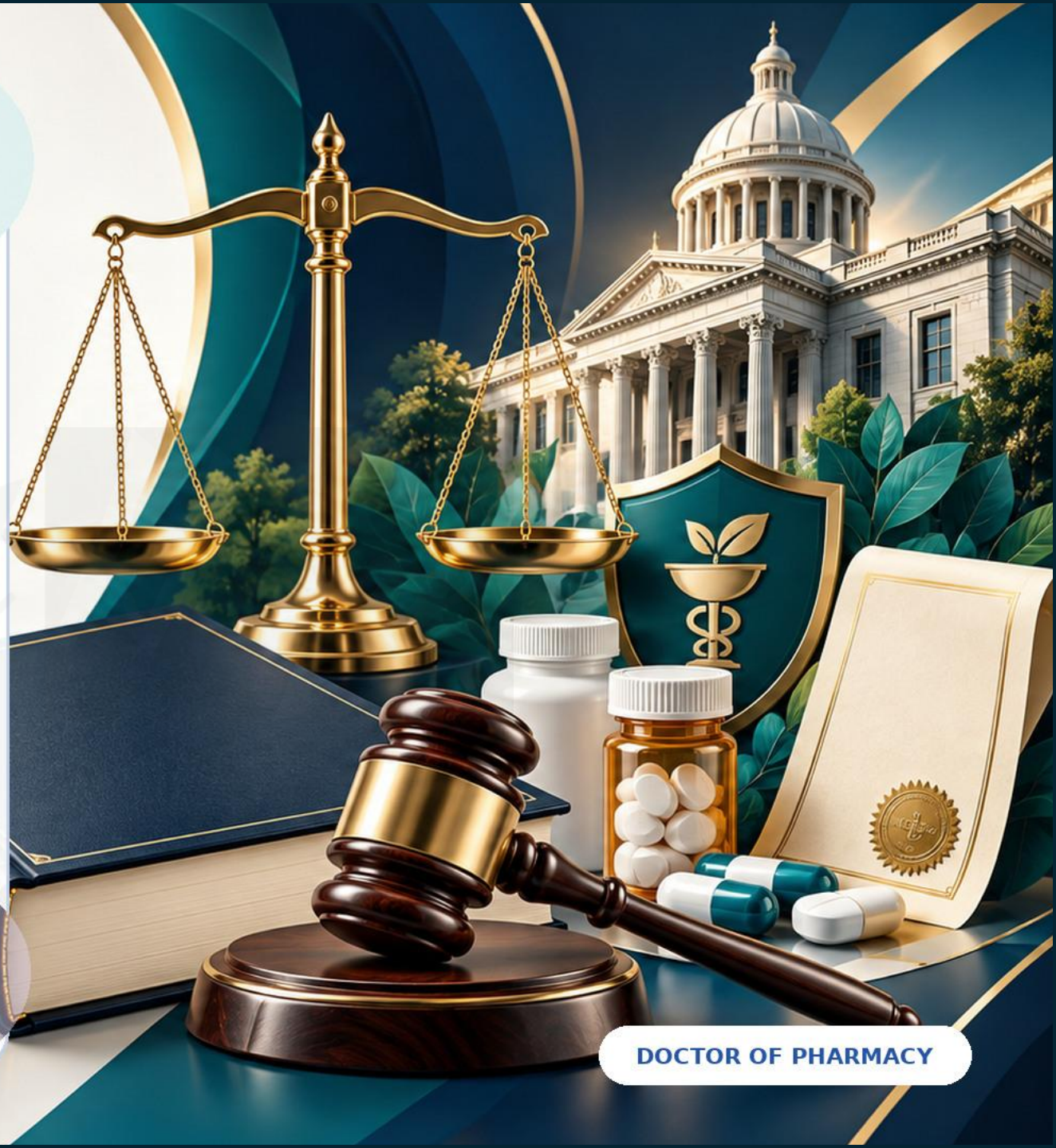
PHARM.D • YEAR 3

Pharmaceutical Analysis

CHAPTER 2.8

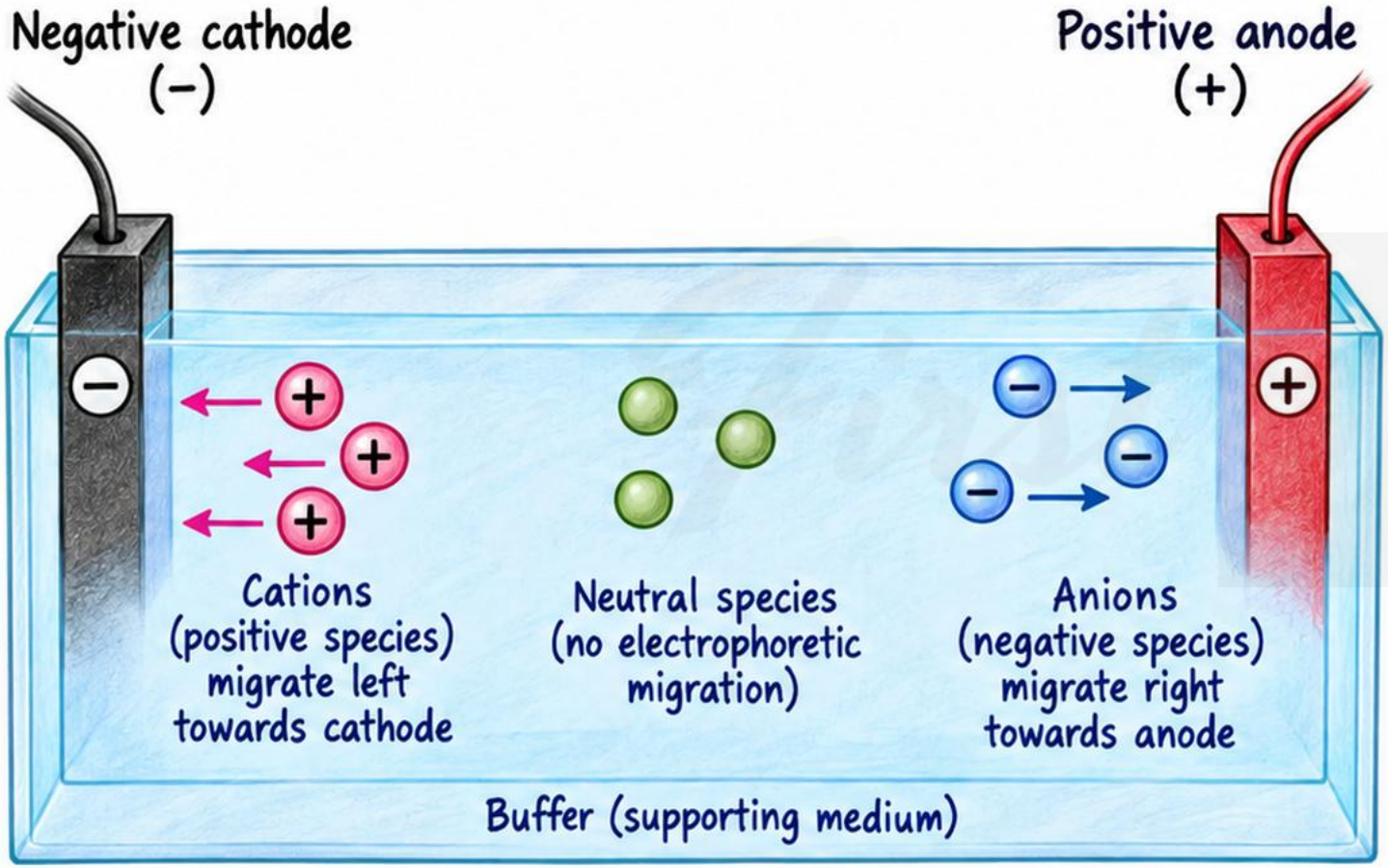
Electrophoresis

PPT CHAPTER COVER



DOCTOR OF PHARMACY

ELECTROPHORESIS: CHARGE IN AN ELECTRIC FIELD



What is electrophoresis?

- Electrophoresis separates charged species by their migration in an electric field.

Direction of movement

- Cations migrate towards the negative cathode.
- Anions migrate towards the positive anode.

Factors affecting migration

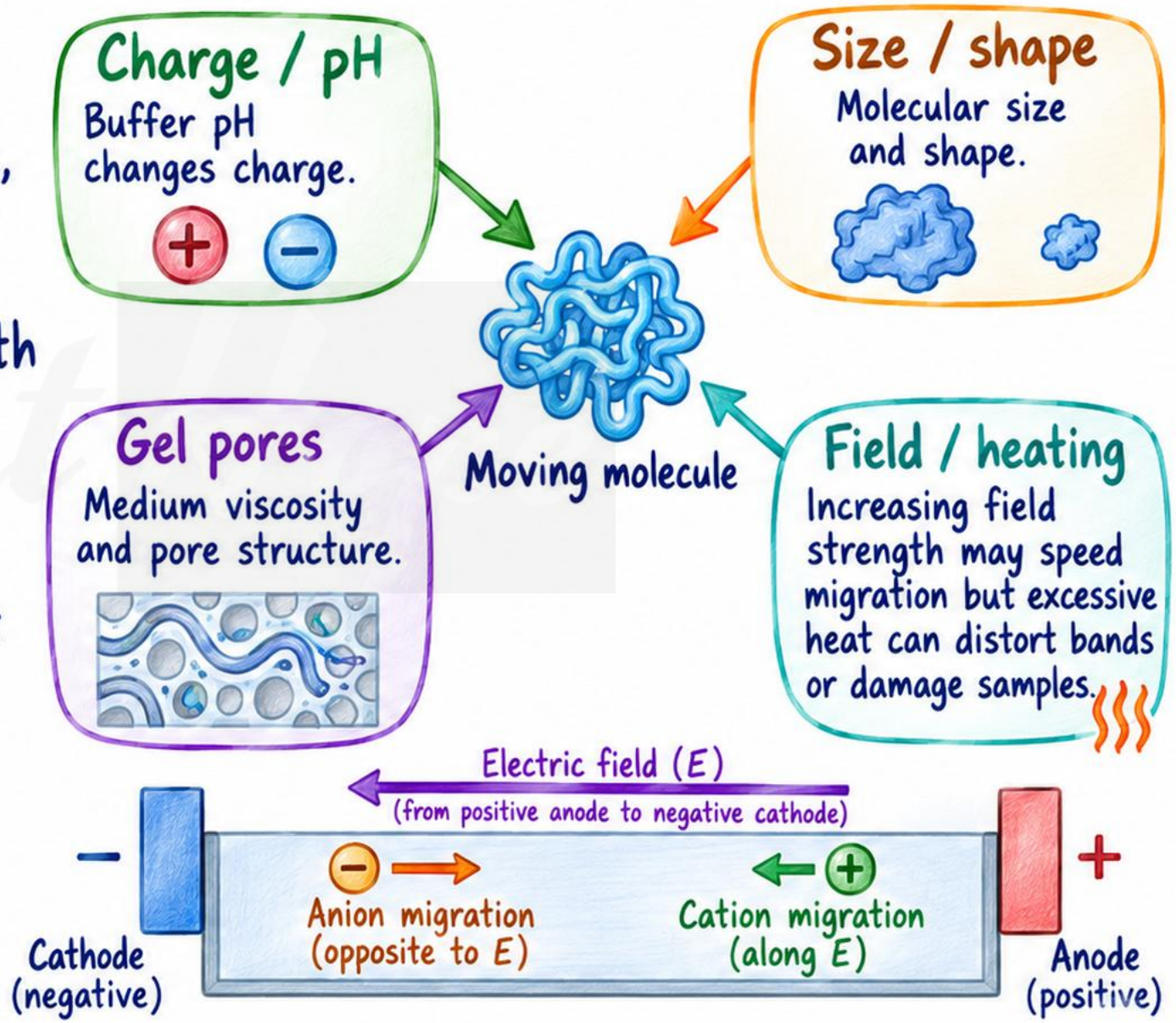
- Migration depends on charge, size, shape and the supporting medium.
- Buffer pH influences ionization and therefore the direction and speed of movement.

Important note

- It is an electrically driven separation, not a type of chromatography.

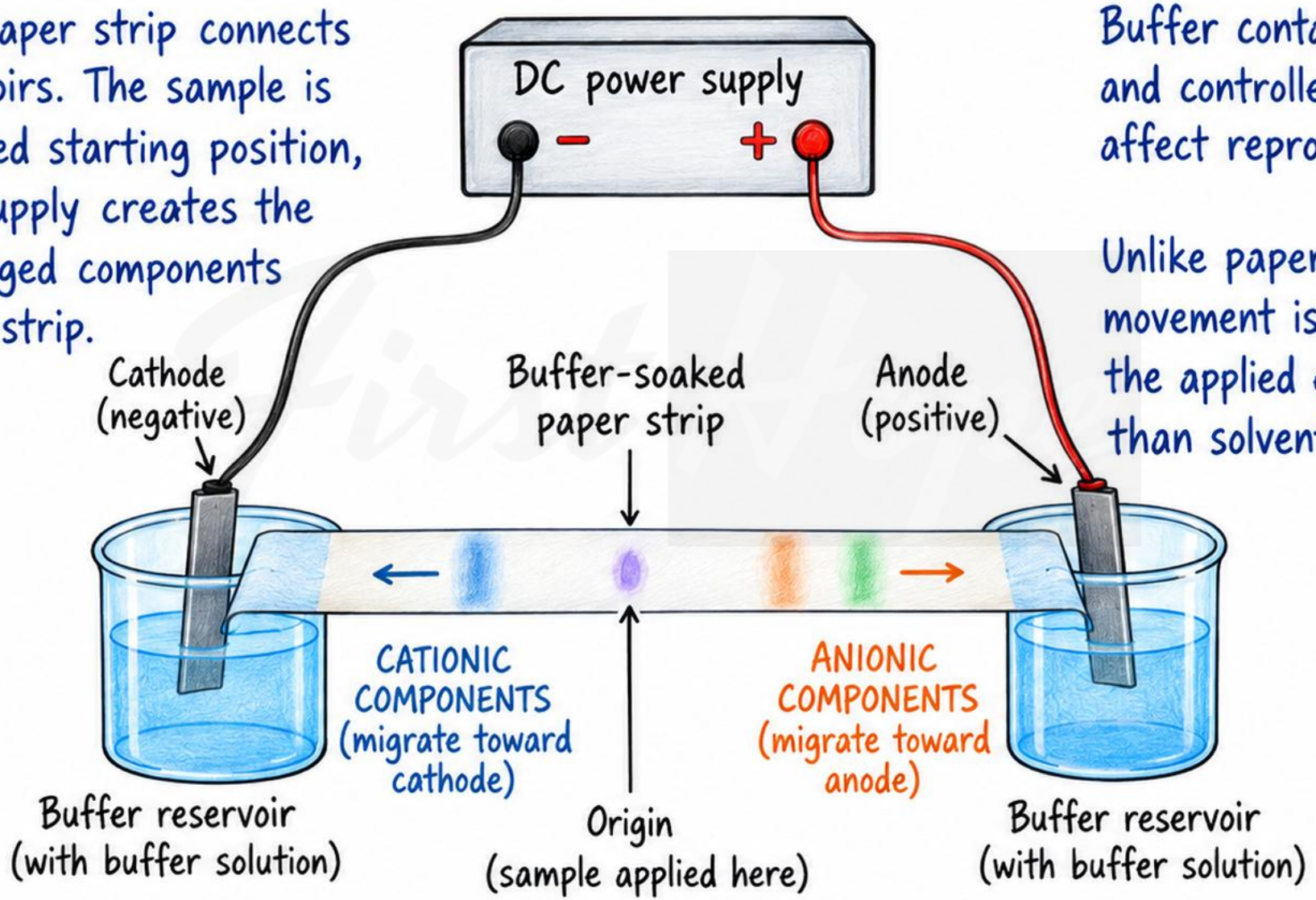
FACTORS CONTROLLING MIGRATION

- Electrophoretic mobility is influenced by net charge, molecular size and shape, medium viscosity and pore structure.
- Buffer pH changes charge; ionic strength affects conductivity and heating.
- Increasing field strength may speed migration but excessive heat can distort bands or damage samples.
- Use controlled conditions and standards when comparing migration patterns between samples.



PAPER ELECTROPHORESIS APPARATUS

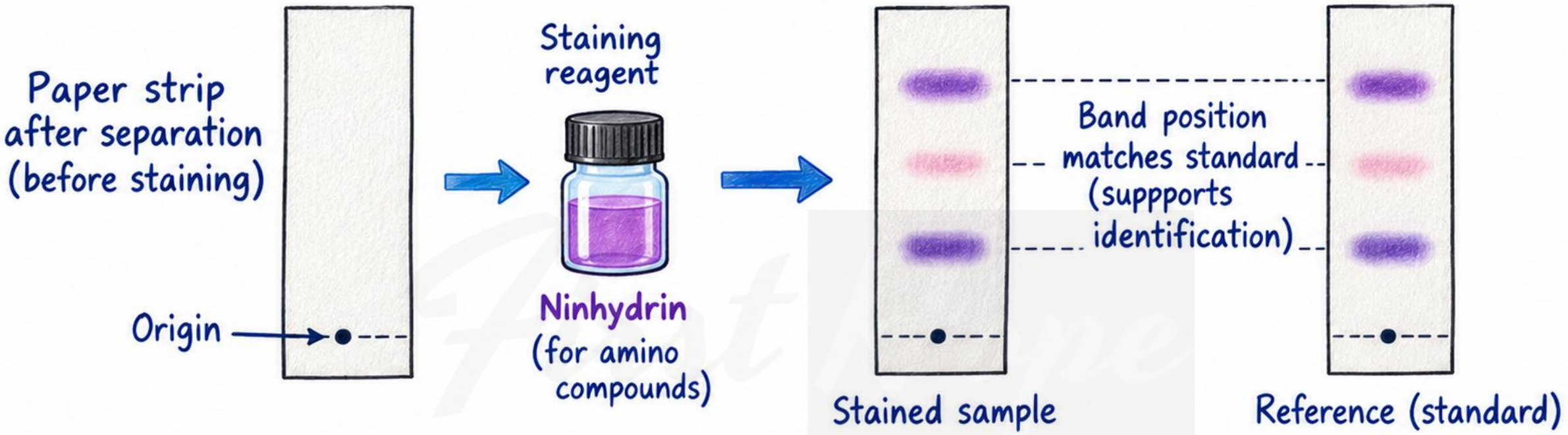
A buffer-soaked paper strip connects two buffer reservoirs. The sample is applied at a defined starting position, and a DC power supply creates the electric field. Charged components migrate along the strip.



Buffer contact, sample loading and controlled running conditions affect reproducibility.

Unlike paper chromatography, movement is driven primarily by the applied electric field rather than solvent-front migration.

DETECTING PAPER ELECTROPHORESIS BANDS



Detection methods

- After separation, bands may be detected by a suitable staining reagent or optical method.
- Ninhydrin can reveal suitable amino compounds; other stains depend on the analyte.

Identification and quantification

- Band position supports identification by comparison with standards.
- Band intensity requires calibration for quantification.

Factors affecting interpretation

- Staining response, overlapping zones and detection limits affect interpretation; invisible components may still be present.

First Hope

FREE PREVIEW

Click here to visit our website

PHARMACY PREMIUM NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.