

Exercise walk-through

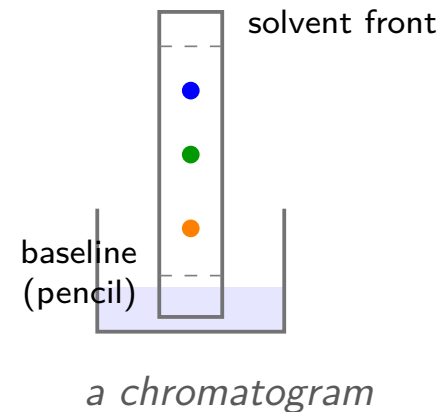
12.3

Chromatography

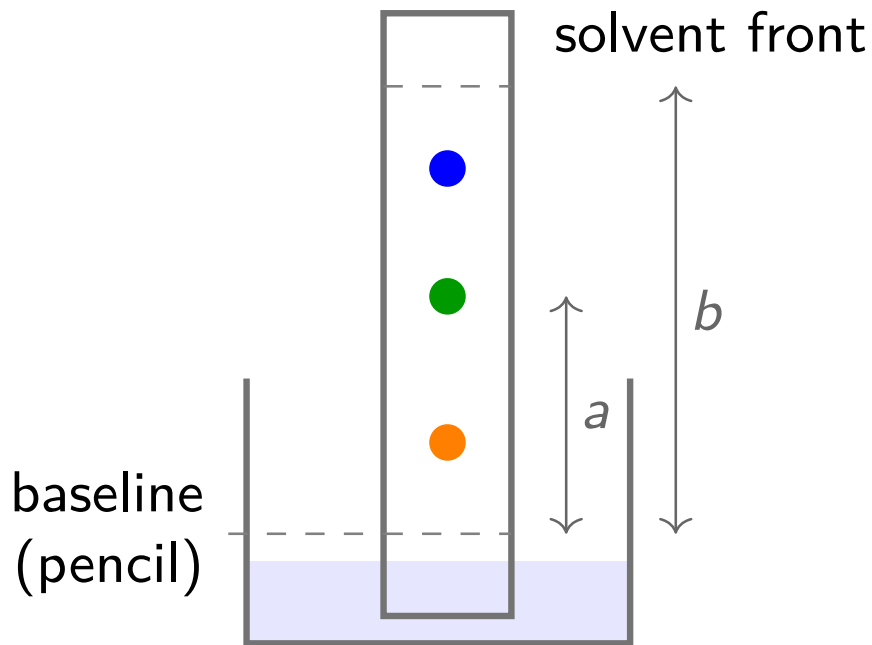
IGCSE Chemistry

What we will cover

- 1 Apparatus & key words
- 2 Titration
- 3 Chromatography
- 4 Separation & purification
- 5 Tests for ions
- 6 Tests for gases & flames



Chromatography



Paper chromatography

separates a soluble mixture as the solvent rises.

$$R_f = \frac{\text{spot distance}}{\text{solvent distance}}$$

A pure substance gives **one** spot.

Topic 12 – key takeaways

1

Titration

exact volume; stop at the end-point

2

Chromatography

$R_f = \text{spot} / \text{solvent}$; pure = one spot

3

Anions

silver nitrate & barium nitrate precipitates

4

Gases

H₂ pops, O₂ relights, CO₂ milky

Exercises 2.1·2.2

2.1 State what a single spot on a chromatogram tells you about a substance. [1]

2.2 State why a locating agent is sometimes needed. [1]

Exercises 2.1·2.2

2.1 State what a single spot on a chromatogram tells you about a substance. [1]

2.1

- a single spot means the substance is **pure**
-

2.2 State why a locating agent is sometimes needed. [1]

2.2

- a locating agent makes **colourless spots show up**

Exercise 3.1

3.1 The R_f value of a spot is the distance moved by the spot divided by the distance moved by the: [1]

☐

A paper

B solvent

C baseline

D beaker

Exercise 3.1

3.1 The R_f value of a spot is the distance moved by the spot divided by the distance moved by the: [1]



A paper

B solvent

C baseline

D beaker

3.1 B

- R_f is the distance moved by the spot divided by the distance moved by the **solvent**
- A, C and D are not the denominator

Exercise 3.2 (a)

3.2 On a chromatogram, a spot moves 3.0 cm while the solvent moves 12.0 cm.

(a) Calculate the R_f value.

[2]

Exercise 3.2 (a)

3.2 On a chromatogram, a spot moves 3.0 cm while the solvent moves 12.0 cm.

(a) Calculate the R_f value.

[2]

(a)

$$R_f = \frac{\text{distance moved by the spot}}{\text{distance moved by the solvent}} = \frac{3.0 \text{ cm}}{12.0 \text{ cm}} = \mathbf{0.25}$$

Exercise 3.2 (b)

3.2 On a chromatogram, a spot moves 3.0 cm while the solvent moves 12.0 cm.

(b) State how a chromatogram can be used to identify an unknown substance. [1]

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3.2 On a chromatogram, a spot moves 3.0 cm while the solvent moves 12.0 cm.

(b) State how a chromatogram can be used to identify an unknown substance. [1]

(b)

- compare its spot / R_f with **known substances** run alongside