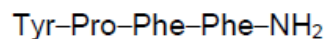


AQA – Amines – A2 2023 Chemistry P3

1. No.3

0 3

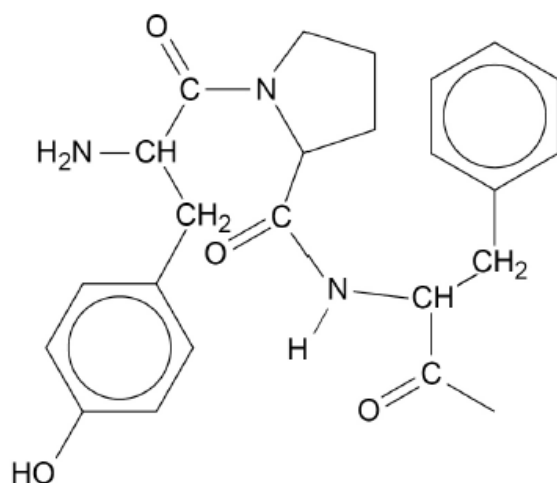
Endomorphin-2 is a peptide with the amino acid sequence shown.



Each amino acid is represented by a three-letter abbreviation.

Tyr = tyrosine Pro = proline Phe = phenylalanine

Figure 2 shows part of the structure of endomorphin-2, showing the Tyr-Pro-Phe- part of the molecule.

Figure 2

0 3 . 1

The -NH_2 at the end of the amino acid sequence of endomorphin-2 shows that the terminal functional group is an amide, not an acid.

Complete the structure of endomorphin-2 in **Figure 2**.

[2 marks]

0 3 . 2

Use the structure in **Figure 2** to draw the skeletal formula of proline, Pro.

[1 mark]

A student hydrolyses a sample of endomorphin-2 to break it down into its constituent amino acids.

The student analyses the resulting mixture by thin-layer chromatography, TLC.

0 3 . 3

State a reagent and the conditions needed for the hydrolysis.

[2 marks]

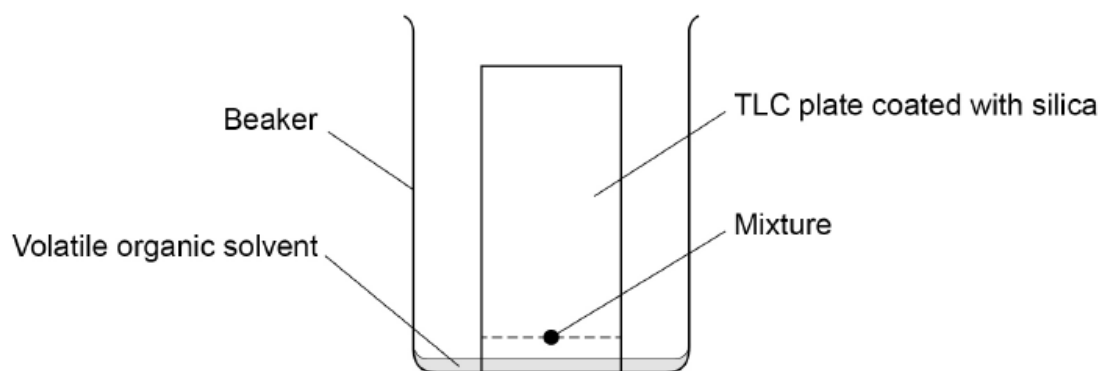
Reagent _____

Conditions _____

0 3 . 4

Figure 3 shows the apparatus used for the TLC.

Figure 3



There is a piece of the apparatus missing from **Figure 3**. This omission will result in an inaccurate chromatogram.

Identify the missing piece of the apparatus.

State and explain why this piece of the apparatus is needed.

[3 marks]

Missing piece _____

Explanation _____

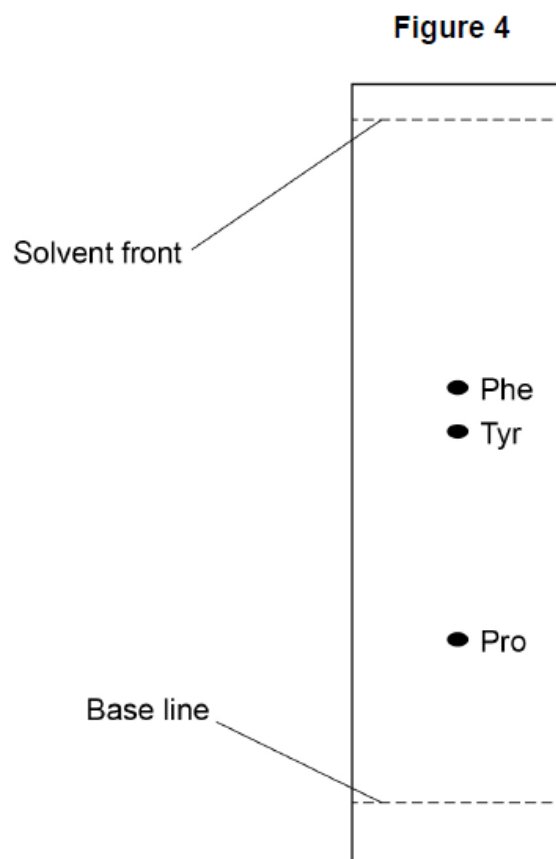
03.5

State why the amino acids separate on the TLC plate.

[1 mark]

When the solvent has risen up the TLC plate, the student removes the plate from the beaker and sprays it with a developing agent.

Figure 4 shows the result.



03.6

Name a suitable developing agent.

State why the developing agent is needed.

[2 marks]

Name _____

Why needed _____

03.7 Determine the R_f value for Tyr.

[1 mark]

R_f _____

2. No.34

Which compound is the strongest base?

[1 mark]

