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Detailed mark scheme

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2002

XVIII

1583

Time allowed
31 Minutes

Score

/26

Percentage

%

CHEMISTRY

**OCR
AS & A LEVEL**

Mark Scheme

**Module 6: Organic chemistry
and analysis**

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F324: Rings, Polymers & Analysis

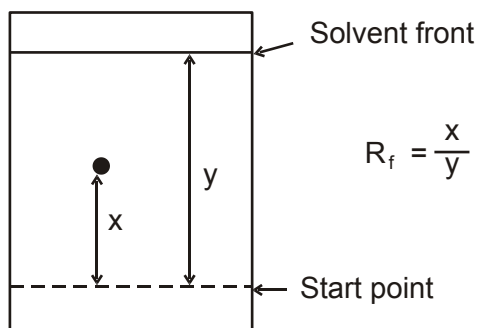
4.3.1 – Chromatography MARK SCHEME

1. (i) adsorption ✓
ALLOW partition OR adsorbtion
IGNORE solubility OR desorption
DO NOT ALLOW absorption 1
- (ii) measure how far each spot travels relative to the solvent front or calculate the R_f value ✓
 compare R_f values to those for known amino acids ✓
ALLOW compare R_f values to database
ALLOW compare to known amino acids
DO NOT ALLOW retention times for first mark, but the 2nd mark would be available as ✓ ECF
ALLOW alternative approach: on the same plate compare position of spots ✓ with known amino acids ✓ 2
- (iii) (amino acids won't separate because) similar compounds have similar R_f (values) ✓
ALLOW spots often overlap OR don't (fully) separate
ALLOW they have similar R_f (values) or similar adsorptions or similar retention times ECF to (ii) 1 [4]
2. (i) one amide link shown correctly (1)
 glycine and phenylalanine parts shown correctly (1)
 proline linked correctly (1) 3
- (ii) 6 (1) 1
- (iii) gas/liquid chromatograph separates the tripeptides (1)
 mass spectrometer produces a distinctive fragmentation pattern (1)
 identification by computer using a spectral database (1) 3 [7]
3. (a) R_f value is distance moved by a component/spot/solute divided by distance moved by solvent. (1)
 Retention time is the time between injection and emergence (or detection) of a component. (1) 2

- (b) (i) Partition / adsorption (1) 1
- (ii) Role of gas: carrier gas / mobile phase / to carry to sample through the chromatography column (1)
- Role of liquid: stationary phase (1) 2
- (iii) Trace with two peaks drawn (1) 1
- (iv) Measure **area** under each peak (1)
- Find total area (1)
- $\% = (\text{area of one peak} / \text{total area}) \times 100\%$ (1) 3

[9]

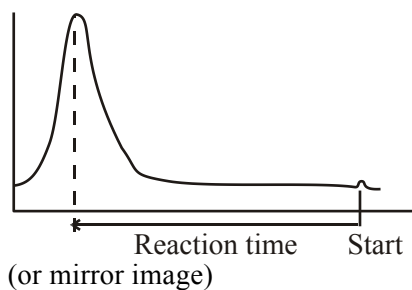
4. (i) Accept paper, column or thin-layer chromatography 1
- (ii) The R_f value 1
- (iii)



1

[3]

5. (a) (i) Retention time 1
- (ii)



1

- (b) Partition 1

[3]