InkChemistry

QUESTION WORKBOOK

Chromatography: TLC, column and gas

Organic analysis · Unit C19

AQA 3.3.16 · OCR A 6.3.1

15 questions · 47 marks

NAVY SCREEN EDITION

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SECTION A · Short, 1 to 2 marks

A1 CTC-Q1
State what is meant by the stationary phase and the mobile phase in thin-layer chromatography. [2]

A2 CTC-Q6
Explain why the baseline on a TLC plate is drawn in pencil and placed above the level of the solvent. [2]

A3 CTC-Q7
Explain why a lid is placed on the tank while a TLC plate is being developed. [2]

A4 CTC-Q9
Suggest two ways of making the colourless spots of amino acids visible on a TLC plate. [2]

A5 CTC-Q19
Explain why percentages calculated from gas chromatogram peak areas may not be the true percentages, and how external calibration avoids the problem. [2]

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SECTION B · Standard, 3 to 5 marks

B1 CTC-Q8
Explain the limitations of gas chromatography alone for identifying the components of a mixture, and how GC–MS overcomes them. [4]

B2 CTC-Q15
Compare thin-layer chromatography with gas chromatography as methods of analysing a mixture. [4]

B3 CTC-Q16
Evaluate a student's identification of a spot with Rf 0.45, on a plate run on Monday, as leucine, because a leucine standard gave Rf 0.45 on a plate run on Friday. [4]

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B4 CTC-Q20 Explain why HPLC rather than gas chromatography is used to measure the sugars in a fruit juice, and why the mobile phase in HPLC is pumped through the column at high pressure. [4]

B5 CTC-Q5 Explain how thin-layer chromatography on silica separates a polar compound from a non-polar compound. [3]

B6 CTC-Q10 Suggest how a chemist could find out whether two compounds that give spots with the same Rf value on a silica plate in one solvent are the same compound. [3]

B7 CTC-Q11 Describe how a mixture is separated in gas chromatography. [3]

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B8 CTC-Q13 Outline how column chromatography is used to obtain a pure sample of one component of a mixture. [3]

B9 CTC-Q14 Explain why, in gas chromatography, propanone (boiling point 56 °C) has a shorter retention time than butan-1-ol (boiling point 118 °C), and what raising the oven temperature does to both. [3]

SECTION C · Long, 6 marks or more

C1 CTC-Q17 Describe how thin-layer chromatography is used to identify the amino acids in a mixture, using standards of known amino acids. [6]

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