

Purity Formulations + Chromatography

Mark Scheme

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Chemistry
Exam Board	AQA
Topic	5.8 Chemical Analysis
Sub-Topic	Purity Formulations + Chromatography
Difficulty Level	Bronze Level
Booklet	Mark Scheme

Time Allowed: 44 minutes

Score: /43

Percentage: /100

Grade Boundaries:

M1.(a)	Flask	1
(b)	Fractional distillation	1
(c)	A – boiling <i>in this order</i>	1
	B – condensing	1
(d)	Pentane	1
(e)	Formulation	1
(f)	the fuel is a pure compound	1
	and crude oil is a mixture or the fuel is made up of four hydrocarbons <i>allow crude oil contains a large number of compounds and the fuel contains four</i> and crude oil could have many more	1
(g)	$(35 + 37 + 37 / 3) = 36.33$	

1

36

1

allow (35 + 48 + 37 + 37 / 4 =) 39(.25) for 1 mark

[10]

M2.(a) start line drawn in ink

1

(so) line would run

1

start line below solvent level

1

(so) samples would wash off

1

(b) red **and** blue

both colours needed

1

(c) yellow

1

travels furthest up the paper

1

(d) distance moved by red ink 13 ± 1

measurements in cm max 1 mark for mps 1 and 2

1

distance from start line to solvent front 44 ± 1

1

correct substitution

1

allow ecf from Table 4

correct answer

1

range if correct is 0.27 to 0.33

to 2 significant figures

1

(e) moves further **or** nearer the top of the paper

1

[13]

M3.(a) additive

1

(b) colour 3 is a mixture of colours 1 and 2

any **two** from:

accept E-number or additive instead of colour
ignore comments about height / level

1

- colour 1 is made up of only one colour / dye
- colour 2 is made up of only one colour / dye

- colour 3 is made up of two colours / dyes
or
more colours (than colours 1 and 2)

2

[4]

M4. (a) (i) chromatography

1

(ii) 3 / three

1

(iii) the colour / E104 is not on the same level as any of the colours in the food
accept E104 does not match

1

(b) (i) to improve the appearance of the food
ignore adds yellow / colour
ignore taste / flavour

1

(ii) further / or different tests (for harmful effects) **or** obtain more evidence
(that it is harmful)
allow do a survey / study

1

[5]

M5. (a) to improve the appearance of the drink

1

because they are permitted colours

1

(b) (i) chromatography 1

(ii) three / 3 1

(iii) because one colour / spot / E102 matched 1

because the other / two colours / spots / E104 and E110 did not match
if no other mark awarded allow because the drink did not contain E104 and E110 or because the drink contained E102 for 1 mark
accept only E102 matched for 2 marks 1

[6]

M6. (i) any **two** from:

- **A** has four colours(*)
- **B** has three colours(*)
() if first two bullets not stated*
*accept **A** has more colours (than **B**) or **B** has less colours (than **A**) for 1 mark only*
- **A / B** have two colours the same
- **B** has one different colour

2

(ii) chromatography 1

[3]

M7. drinks / colours B **and** C are safe

1

drinks / colours A **and** D are not safe

*accept a pair of one safe colour **and** one not safe colour
identified for 1 mark*

accept A, B, C and D all contain one safe colour for 1 mark

ignore references to shading

1

[2]