

MARK SCHEME

GCSE

CHEMISTRY

AQA - COMBINED SCIENCE

C8 - TEST 3

CHEMICAL ANALYSIS

Intermediate

Mark schemes

1.

(a) more than 1 dot in a vertical line

1

(b) correct equation and substitution $7/39$

accept $R_f = \text{distance moved by spot C} / \text{distance moved by solvent}$

1

calculation and answer 0.1795

1

answer to 2 significant figures 0.18

1

(c)

Level 3: The plan would lead to the production of a valid outcome. All key steps are identified and logically sequenced.	5-6
Level 2: The plan would not necessarily lead to a valid outcome. Most steps are identified, but the plan is not fully logically sequenced.	3-4
Level 1: The plan would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.	1-2
No relevant content	0
Indicative content <ul style="list-style-type: none"> • put dots of known colours, and a dot of the ink on a pencil line on the chromatography paper. • place the bottom of the paper in water, making sure the start line is above the water • leave for solvent to rise up through paper. • when solvent near top of paper, remove and leave to dry. • compare positions of dots for known colours with those from ink 	

6

[10]

- 2.** (a) $R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$ 1
- 5.1 ± 0.1 cm **and** 6.8 ± 0.1 cm 1
both measurements from figure
- $\frac{5.1}{6.8}$ 1
- 0.75 1
allow answer in range 0.72–0.77
allow ecf from incorrect measurements to final mark for 3 marks
an answer in range of 0.72–0.77 scores 4 marks
- (b) drug **D** contains one of the substances in **E** 1
- drug **D** contains drug **B** 1
- (and) a compound not found in any of the other drugs 1
allow an unknown substance
if no other marks awarded allow 1 mark for it is a mixture/ impure or
it contains three substances
- (c) **A** as it has travelled the furthest in the solvent 1
ignore A unqualified
- (d) spot has stayed on the start line 1
- (because) it is insoluble 1
- [10]**

- 3.** (a) check if safe to eat / healthy
- or**
- permitted
- accept references to allergies / medical problems*
- 1

(b) any **three** from:

accept dye for colour

- made up of two colours / dots
- contains an unknown colour / dot
- contains a harmful colour
- contains E104 / quinoline yellow
or does not contain E133 / brilliant blue
- further analysis needed

3

(c) ignore No or Yes but No must be implied

there could be other additives (in the sweets)

*accept any other type of additives but **not** colourings*

1

could still contain / use / add natural colours

accept non-artificial for natural

or

named natural colours

1

[6]

4.

use of solvent / solution / water / any named solvent

1

separates / carries colour(s) / dye(s)

allow any idea of movement

eg runs / moves

1

match against Rf value / known chromatogram / similar pattern

or comparison to permitted additive / colour

removal of coloured additive from salmon does not gain any marks

ignore reasons for separation

maximum 2 if technique clearly doesn't work

1

[3]