

## Mark schemes



- 1.** (a) crush the flower 1  
use more flowers 1  
(b) the start line is drawn in ink 1  
uses water as the solvent 1  
(c) flower A contains a single pure colour 1  
the colour in flower C is a mixture 1  
(d)  $\frac{7.2}{9.0}$  1  
= 0.8 1  
*an answer of 0.8 scores 2 marks*  
*ignore units*

[8]

- 2.** (a) start line drawn in ink 1  
*allow start line should have been drawn in pencil*  
(so) ink dissolves  
*(as) pencil does not dissolve*  
**or**  
ink runs in solvent / water  
**or**  
*pencil does not run in solvent / water* 1  
water used (as solvent)  
*allow ethanol not used*  
**or**  
water in beaker 1  
(so) colours will not dissolve 1



- (b) any **two** from:
- the flowers have no colours in common  
*allow the flowers are not the same colour*
  - A / B contain one colour
  - C contains two colours  
*allow C is a mixture of colours*
  - (the colour in) B is most soluble  
*allow (the colour in) B has the highest  $R_f$  value*  
*allow one of the colours in C is the least soluble*

2

(c) (distance moved) =  $\frac{3.2}{0.65}$

1

(distance moved) = 4.9 (cm)

*allow 4.923076923 (cm) correctly rounded*

1

*an answer of 4.9 (cm) scores 2 marks*

[8]

3.

- (a) The start line was drawn in ink

1

The water level was above the spots

1

- (b) 3

1

- (c) **A**

1

- (d) (distance moved by dye A) 38 (mm)

*allow values in range 36-40*

1

(distance from start line to solvent front)

102 (mm)

*allow values in range 101-103*

1

$$\frac{38}{102}$$

*allow ecf from Table 1*

1

0.37254 ...

*allow values in*

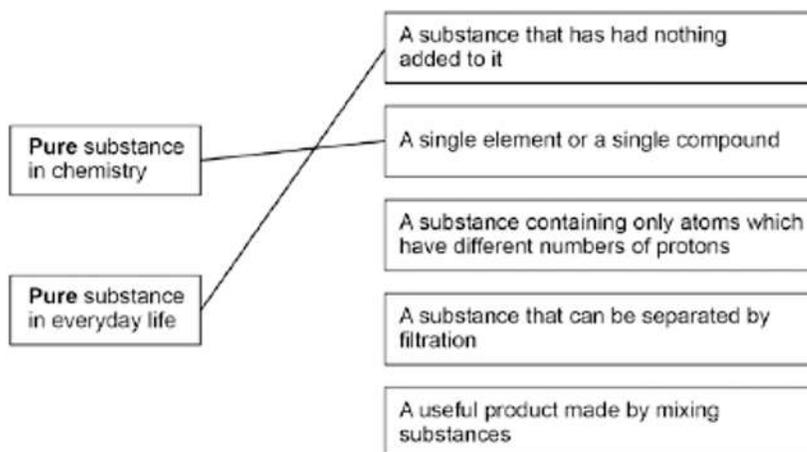
1



accept 0.37 with no working shown for **5** marks

- 4.** (a) (improve) appearance  
*allow add colour*  
*allow these food colourings have not been proven to cause hyperactive behaviour in young children*  
*do **not** accept taste / flavour / preservatives*  
*ignore reference to E-numbers* 1
- (b) X 1
- (c) any **three** from:
- S contains six / 6 colourings
  - P contains five / 5 colourings  
*if neither of first 2 bullet points given allow **1** mark for S contains more colours than P **or** converse*
  - both S and P contain the same  
 five / 5 colourings
  - both contain W **and** Y
  - both sweets (may) cause hyperactivity  
*ignore unsafe*
  - neither contain X **and** Z 3
- 5.** (a) Air 2
- Steel 1
- [5]**

(b)



Allow **1** mark for the correct meanings linked to context but incorrect way around

1

(c) Damp litmus paper turns white

1

(d) Iron(III)

1

**[6]**