



KS3 Science

Separation Techniques

Mark Scheme

Time available: 41 minutes

Marks available: 57 marks

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Mark schemes

1.

- (a) any **one** from
- the colour had changed
 - the water was brown **or** darker **or** grey
accept 'the colour'
*do **not** accept 'the coffee disappeared'*
- 1 (L3)
- (b) (i) • D
- 1 (L3)
- (ii) • P
- accept 'the filter paper'*
'the filter' is insufficient
accept 'the paper'
- 1 (L3)
- (c) (i) any **one** from
- to cool the water vapour
*accept 'to cool the steam **or** gas'*
 - to condense the water vapour
*accept 'to condense the steam **or** gas'*
 - change gas **or** vapour back to water
*accept 'to cool it **or** the glass tube'*
*do **not** accept references to liquid coffee condensing*
- 1 (L3)
- (ii) • *from a liquid into a gas*
- 2 (L4)
- evaporation
- 1 (L4)
- condensation
- 1 (L4)
- award one mark for each correct word in the correct place*

[8]

2.

(a) (i) any **one** from

- to stop water vapour **or** steam escaping
*accept 'gas **or** vapour **or** particles could escape'
'to stop water escaping **or** spilling out' is insufficient*
- to stop lavender oil vapour escaping
*accept 'to stop oil escaping'
accept 'to make sure the oil goes down the tube'
accept 'the oil **or** vapours could not be collected'
'to stop the smell escaping' is insufficient*
- to reduce heat loss
*accept 'to stop heat loss' **or** 'to keep heat in'
accept 'to stop the heat escaping'
accept 'to maintain the pressure'*

1 (L5)

(ii) any **one** from

- it could explode
- it could break
*accept 'the lid might come off'
accept 'so the pressure does not break the seal'
'the pressure would be too high' is insufficient
'it would get too hot' is insufficient*

1 (L5)

(b) (i) • *from gas to liquid*

both answers are required for the mark
answers must be in the correct order

1 (L5)

(ii) any **one** from

- it sinks
accept 'lavender oil floats'
- it is at the bottom
*accept 'the oil is on the top'
'they are not mixed' is insufficient*

1 (L6)

(c) • B

if more than one letter is identified, award no mark

1 (L6)

[5]

- 3.** (a) (i) • filtration ✓
if more than one box is ticked, award no mark 1 (L3)
- (ii) • A: sand
accept 'residue' 1 (L3)
- (iii) • B: filter paper
accept 'paper' or 'filter'
do not accept 'funnel' or 'filter funnel' 1 (L4)
- (b) (i) • 100 1 (L4)
- (ii) it had evaporated
accept 'it went into the air'
do not accept 'it disappeared' 1 (L3)
- (iii) salt
accept 'sodium chloride'
accept 'salts' or 'minerals' or 'crystals' 1 (L4)
- [6]**
- 4.** (a) evaporation then condensation ✓
if more than one box is ticked, award no mark 1 (L5)
- (b) water
accept 'distillate' 1 (L5)
- (c) 100
accept a temperature from 99 to 101 1 (L5)
- (d) (i) a temperature above 15 but below 100
 any **one** from
- it is heated by the water vapour
accept 'vapour or steam or hot water' for water vapour
 - thermal energy **or** heat is transferred from the water vapour
accept 'it heats up'
both the answer and the correct explanation are required
 for the mark 1 (L6)

(ii) any **one** from

- it condenses

accept 'it makes condensation'

- it changes to a liquid

accept 'it is liquid'

accept 'it changes state'

accept 'it turns to water'

1 (L6)

- its temperature falls

accept 'it cools' 'it changes temperature' is insufficient

1 (L6)

(e) any **one** from

- cold water replaces warm water

*accept 'it cools the water vapour better **or** more efficiently
or quickly'*

accept 'it will work faster'

- the water stays cold **or** cooler

- there is a bigger difference in temperature between the water vapour and the water

- some vapour escapes in B

*accept 'it is cooled over a bigger length **or** for longer'*

accept 'more water is collected'

1 (L6)

[7]

5.

(a) It has a high melting point. ✓

1 (L4)

It is a good conductor of heat and electricity. ✓

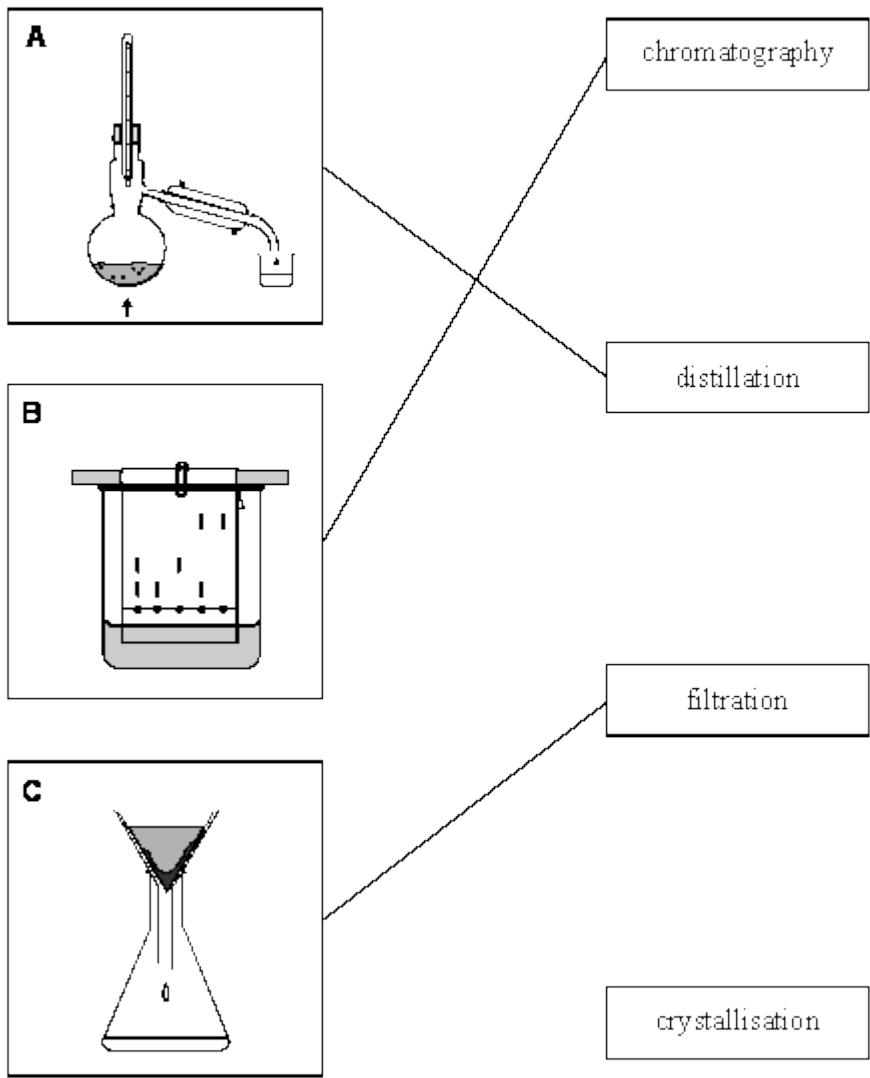
*if more than two boxes are ticked,
deduct one mark for each incorrect tick
minimum mark zero*

1 (L4)

- (b) (i) filtration **or** filtering
accept 'filter'
1 (L3)
- (ii) A: black particles **or** solid **or** residue
accept 'particles' or 'solids'
do not accept 'blue particles'
1 (L3)
- B: blue solution **or** filtrate
accept 'solution'
accept 'liquid'
do not accept 'black solution'
do not accept 'mixture'
1 (L3)
- (c) the water had evaporated
accept 'the liquid had evaporated' or 'it had evaporated'
'it had dried up' is insufficient
accept a description of evaporation eg 'it turned into gas'
do not accept 'the solution evaporated'
1 (L4)

[6]

6. (a)



*if more than one line is drawn from a diagram,
award no mark for that diagram*

3 (L4)

(b) (i) C

accept 'filtration'

1 (L3)

(ii) A

accept 'distillation'

1 (L4)

[5]

7. (a) (i) blue

1

(ii) black

1

(b) copper oxide + sulphuric acid → copper sulphate + water
the whole word equation is required for the mark
reactants may be in either order
ignore references to oxidation states 1

(c) to separate **or** remove the copper oxide
accept 'to purify the solution'
*accept 'to separate **or** remove the black solid'*
accept 'to separate the solid from the liquid'
*do **not** accept 'because no more solid would dissolve'* 1

[4]

8.

(a) (i) soluble 1 (L4)

(ii) insoluble 1 (L4)

(iii) solution 1 (L4)

(b) any **one** from

- evaporate the water
- boil the water away
accept 'evaporating'
*accept 'heat it' **or** 'boil it' **or** 'freeze dry it'*
*do **not** accept 'dry it' **or** 'distil it'*

1 (L4)

(c) (i) any **one** from

- less coffee dissolves
accept 'not as much dissolves'
- coffee is less soluble in cold water
accept 'it does not dissolve as quickly in cold water'

1 (L4)

(ii) less than before ✓
if more than one box is ticked award no mark 1 (L4)

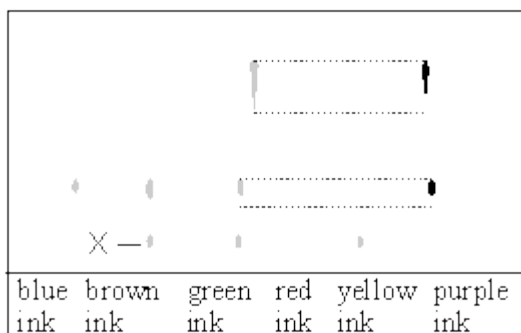
[6]

9.

(a) filtration **or** filtering 1

distillation **or** distilling 1

- (b) (i) sand and water
if more than one box is ticked award no mark 1
- (ii) dissolved salt and water 1
- (c) (i) the correct positions of both red and blue spots are required for the mark
if more than two spots are drawn award no mark
*the sizes of the spots need **not** be the same as those*
in the question



- (ii) blue, yellow, red
*all **three** must be correct for the one mark* 1
- (iii) yellow 1

[7]

10.

- (a) contains (large amounts of) dissolved solids / difficult to remove dissolved solids
allow salty / too much salt
allow sea water makes you thirsty / vomit
allow polluted / untreated / contaminated 1
- (b) filtered: removes solids / removes insoluble material / dirt
ignore large objects 1
- chlorine: kills/destroy bacteria/microbes/ germs etc
*allow disinfect / sterilise **or** gets rid of bacteria*
ignore purify / clean 1

[3]