

**Lord Wandsworth College
Scholarship Assessment**

Chemistry SAMPLE

Name: _____

Class: _____

Date: _____

Time: **25 minutes**

Marks: **28 marks**

Comments:

Q1.

- (a) Amy's family are at the beach during the summer.
Amy and her sister have a bucket containing seawater and sand.



Read the following statements.
Which are **true** and which are **false**?

Tick **one** box for each statement.

true **false**

Water is a solvent for salt.

<input type="checkbox"/>	<input type="checkbox"/>
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Sand sinks in water because water is more dense than sand.

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

When a solid dissolves in water, the solid is called a solute.

<input type="checkbox"/>	<input type="checkbox"/>
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2 marks

- (b) Seawater contains dissolved salt.
Describe what Amy can do to separate **and** collect pure water from seawater.

.....

.....

2 marks

(c) Draw a line from each of the **substances** below to the **group** that it belongs to.
Draw only **three** lines.

Draw a line from each **group** to the correct **description**.
Draw only **three** lines.

substance	group	description
seawater	compound	It contains two or more types of atoms or molecules which can be physically separated.
salt	mixture	It contains only one type of atom.
oxygen	element	Two or more types of atoms are chemically joined together.

2 marks
maximum 6 marks

Q2.

Michelle added some universal indicator solution to four liquids.

Michelle uses the pH chart to fill in her table of results.

pH chart

pH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
colour	red			orange			green	blue			purple			

(a) The table below shows some of Michelle's results.

Complete Michelle's table of results below.
Use the pH chart to help you.

liquid	colour of universal indicator solution	pH
milk	green	
rain water		5
hydrochloric acid	red	
bleach		11

2 marks

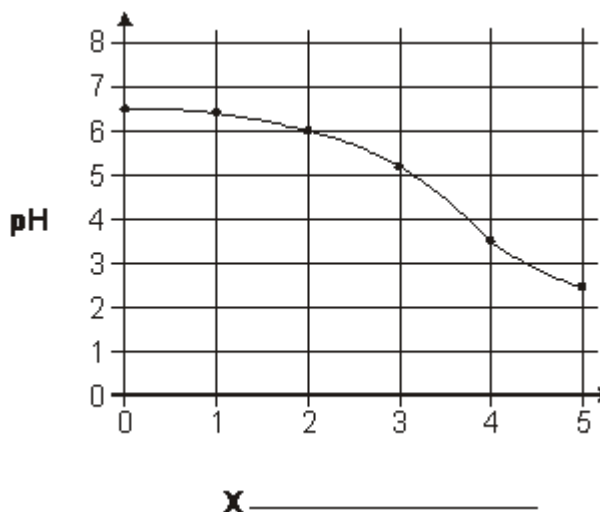
(b) Explain why using acids can be dangerous.

.....
.....

1 mark

(c) Michelle measured the pH of some milk stored at room temperature for five days.

The graph of Michelle's results is shown below.
One of the axes has been labelled.



1 mark

(i) Write the axis label for the graph at X.

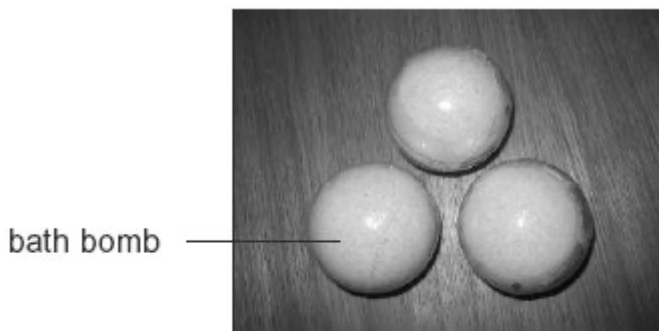
(ii) Use the graph. How does the pH of the milk change over the five days?

.....

1 mark

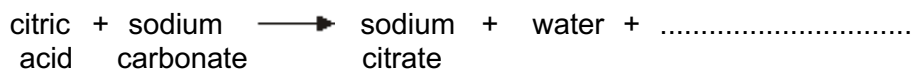
Q3.

When bath 'bombs' are dropped into bath water they colour the water and make the water smell of perfume.



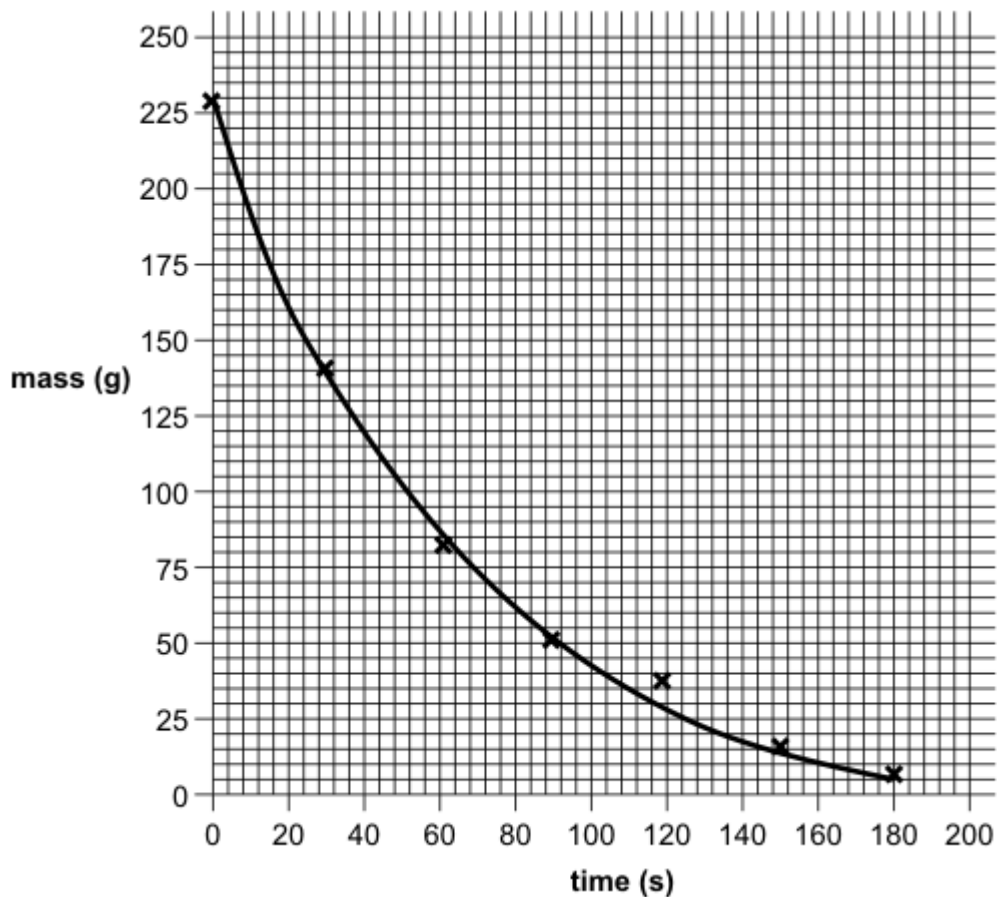
- (a) Bath bombs contain citric acid and sodium carbonate. When they react a gas is produced.

Complete the word equation for the reaction that takes place.



1 mark

- (b) A bath bomb was dropped into hot water and its mass was measured every thirty seconds, for three minutes. The graph below shows the results.



Between which two times on the graph does the mass of the bath bomb decrease fastest?
Tick the correct box.

between 0 s and 30s

between 30 s and 60s

between 90 s and 120s

between 150 s and 180s

1 mark

(c) (i) The bath bomb was 230g at the start.
How long does it take for the mass of the bath bomb to decrease by a half?

..... s

1 mark

(ii) The reactants in a bath bomb were 176g at the start.
129g of sodium citrate and 14g of water are produced in the reaction.
Calculate the mass of gas produced in the reaction.

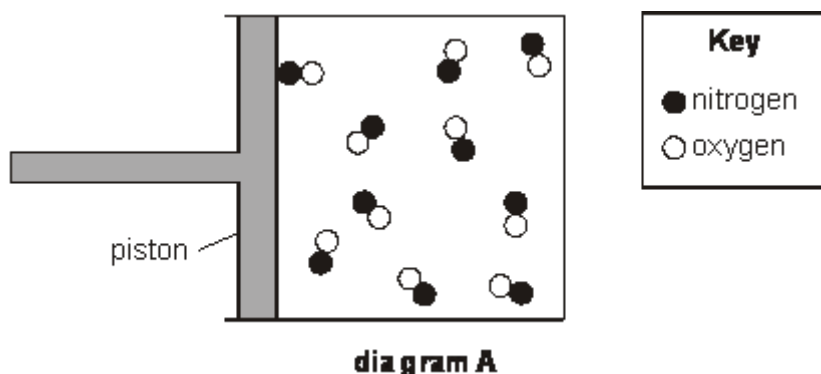
.....

..... g

1 mark

Q4.

Diagram A represents a gas in a container.
The gas can be compressed by moving the piston to the right.



(a) (i) How can you tell that the substance in the container is a gas?

.....

.....

1 mark

(ii) How can you tell from the diagram that the gas is pure?

.....
.....

1 mark

(b) The piston is moved to the right as shown in diagram **B**.

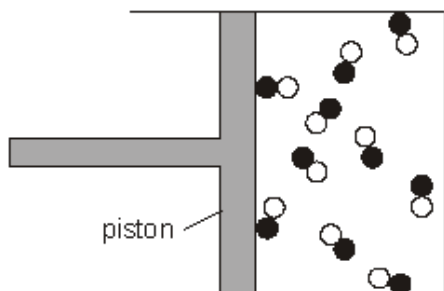


diagram B

How can you tell, from diagram **B**, that the pressure of the gas has increased?

.....
.....

1 mark

(c) Diagram **C** shows what happened to the molecules after the gas was compressed more.

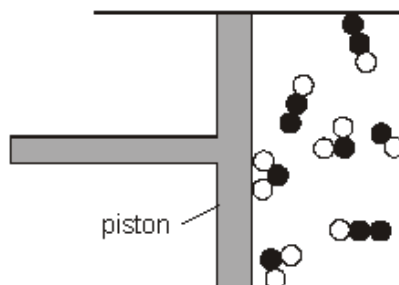


diagram C

(i) How can you tell that a chemical reaction happened when the gas was compressed?

.....
.....




1 mark



(ii) The mass of the gas in both diagrams **B** and **C** was 0.3 g.

Why did the mass of the gas **not** change when it was compressed?

.....
.....

- (iii) Complete the table below with the correct chemical formula of each substance. Use the key to help you.

substance	formula
	
	
	

Key
 nitrogen
 oxygen

1 mark

- (iv) What is the **name** of the substance represented by the symbol ?

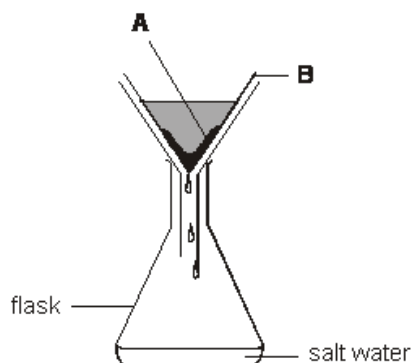
.....

1 mark
maximum 7 marks

Q5.

Chris collected some sea water near a beach.
The sea water had salt dissolved in it. It had sand mixed in it.

- (a) Chris separated the sand from the salt water as shown below.



- (i) What is this method of separation called?
Tick the correct box.

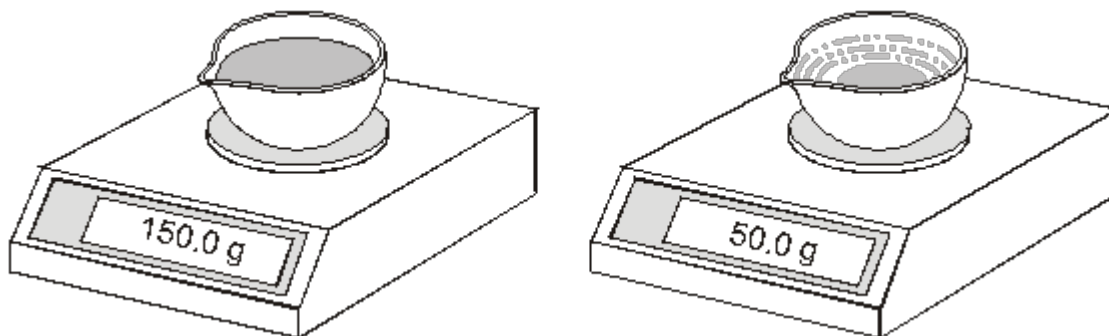
chromatography	<input type="checkbox"/>	distillation	<input type="checkbox"/>
filtration	<input type="checkbox"/>	magnetism	<input type="checkbox"/>

- (ii) What is substance A?

.....

- (iii) What is the part labelled B?

-
- (b) Chris poured some of the salt water from the flask into a dish.
He put the dish on a balance and left it in a warm room for a week.



- (i) Look at the two readings on the balance.

Work out the decrease in mass.

..... g

- (ii) After one week there was a white solid but **no** liquid in the dish.
What had happened to the water in the dish?

.....

- (iii) What was the white solid left in the dish?

.....

3 marks
maximum 6 marks

Mark schemes

Q1.

- (a) • *true* *false*
- | | |
|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> |

*for all three correct boxes ticked, award two marks
for any two correct, award one mark*

2 (L6)

- (b) • evaporate the water **or** evaporation
accept 'heat it'
accept 'it goes from liquid to gas'
accept 'boiling'
*do not accept an incorrect use of evaporation,
e.g. 'she evaporates salt from sand'*

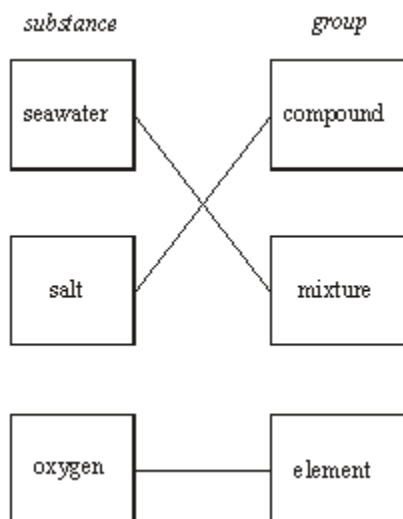
1 (L5)

- condense the water vapour **or** condensation
accept 'it goes from gas to liquid'
do not accept 'it condenses to water vapour'

1 (L5)

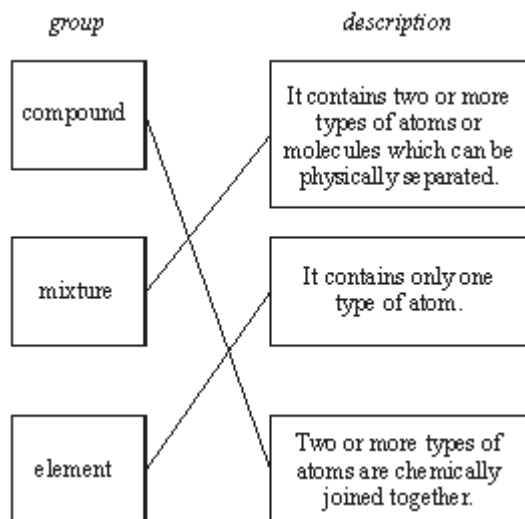
*accept, for two marks, 'distil **or** distillation'*
accept, for one mark, 'condensation then evaporation'

(c)



*all three lines are required for one mark
if more than one line goes from any one box,
do not award the mark*

1 (L5)



*all **three** lines are required for one mark
if more than one line goes from any one box,
do not award the mark*

1 (L6)

[6]

Q2.

- (a)
- 7
 - orange
 - an answer in the range 1–3 *accept '1–3'*
 - purple

*for **all four** rows correct, award two marks
for any **two** or **three** rows correct, award one mark
answers must be in the correct column and row in the table*

2 (L3)

- (b) any **one** from

- they are corrosive
- they burn **or** irritate
*accept 'they can damage your skin or eyes'
'in case it touches your skin' is insufficient
it is harmful **or** poisonous' is insufficient
'it can kill you' is insufficient
'wear gloves' is insufficient
do **not** accept 'it is flammable'*

1 (L4)

- (c) (i)
- time, in days
*accept 'time'
accept 'days'
do **not** accept 'hours' or 'minutes'*

1 (L4)

- (ii) it goes down or decreases
accept 'it becomes acidic'
'it goes red' is insufficient
accept 'it goes from 6.5 to 2.5'
accept 'the acid gets stronger'
'it goes sour' is insufficient
if the label for X is incorrect in part (ci),
do not penalise again in part (cii)

1 (L4)

[5]

Q3.

- (a) carbon dioxide
accept 'CO₂'
- (b) between 0 s and 30 s ✓
*if more than **one** box is ticked, award no mark*
- (c) (i) any answer from 41 to 45
- (ii) 33 g
accept '176 – 129 – 14'
accept '176 – 143'
*do **not** accept incorrect calculations,*
e.g. '176 – 129 – 14 = 34'

1 (L6)

1 (L6)

1 (L7)

1 (L7)

[4]

Q4.

- (a) (i) • (molecules) are far apart **or** not touching each other
accept 'only gases can be compressed'
'the gas can be compressed' is insufficient
as it is given in the question
accept 'they are randomly arranged'
- (ii) • there is only one type of molecule
or compound **or** substance
accept 'there is one type of particle'
*do **not** accept 'there is only one type of atom **or** element'*

1 (L7)

1 (L7)

(b) any **one** from

- the space **or** distance between the molecules **or** particles is smaller
accept 'the volume is less'
accept 'atoms' for 'particles'
- the particles **or** they are closer together
- more particles are touching the sides
accept 'particles hit the sides more often'
'the particles are hitting the sides' is insufficient
'if the gas is compressed the pressure rises' is insufficient

1 (L7)

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

- new **or** different compounds have formed
accept 'they are now joined in threes'
*accept 'new combinations of particles **or** atoms'*
- there is more than one compound
accept 'the compounds are different'
accept 'there is no longer a pure substance'




1 (L7)

(ii) any **one** from

- the same number of atoms are present
accept 'mass is conserved'
'the mass stays the same' is insufficient
- nothing has been added to **or** lost
'the same atoms are present' is insufficient
'nothing changed' is insufficient
'the amount of gas stays the same' is insufficient

1 (L7)

(iii) •

	NO
	N ₂ O
	NO ₂

accept 'ON'

accept 'ON₂'

accept 'O₂N'

all three answers are required for the mark

1 (L7)

- (iv) • nitrogen oxide
accept 'nitrogen monoxide'
accept 'nitric oxide'

1 (L7)

[7]

Q5.

- (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]