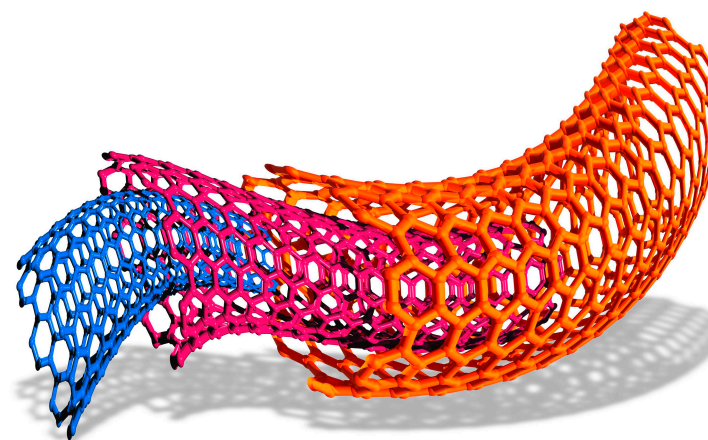


Interactive Example Candidate Responses

Paper 5 (May / June 2016), Question 2

Cambridge IGCSE™
Chemistry 0620



In order to help us develop the highest quality resources, we are undertaking a continuous programme of review; not only to measure the success of our resources but also to highlight areas for improvement and to identify new development needs.

We invite you to complete our survey by visiting the website below. Your comments on the quality and relevance of our resources are very important to us.

www.surveymonkey.co.uk/r/GL6ZNJB

Would you like to become a Cambridge International consultant and help us develop support materials?

Please follow the link below to register your interest.

www.cambridgeinternational.org/cambridge-for/teachers/teacherconsultants/

Copyright © UCLES 2017

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.

UCLES retains the copyright on all its publications. Registered Centres are permitted to copy material from this booklet for their own internal use. However, we cannot give permission to Centres to photocopy any material that is acknowledged to a third party, even for internal use within a Centre.

- 2 You are provided with two solutions, solution Q and solution R.
Carry out the following tests on solution Q and solution R, recording all of your observations at each stage.

Select
page

tests on solution Q

- (a) Divide solution Q into four equal portions in four test-tubes. Carry out the following tests.

- (i) Use pH indicator paper to measure the pH of the first portion of solution Q.

pH 2 [1]

- (ii) Add a 2 cm strip of magnesium ribbon to the second portion of solution Q. Test the gas given off.

Record your observations.

Fizzing, bubbles produced. Lit splint went 'pop' when introduced to the test-tube. [2]

- (iii) Add a spatula measure of sodium carbonate to the third portion of solution Q. Test the gas given off.

Record your observations.

Fizzing. Limewater went cloudy when gas given off. I ran through it, used a pipette. [2]

- (iv) Add a few drops of dilute nitric acid and about 1 cm³ of aqueous barium nitrate to the fourth portion of solution Q.

Record your observations.

White precipitate formed. [1]

tests on solution R

- (b) Divide solution R into four equal portions in four test-tubes. Carry out the following tests.

- (i) Measure the pH of the first portion of solution R.

pH 10 [1]

- (ii) Add several drops of aqueous sodium hydroxide to the second portion of solution R and shake the test-tube.

Then add excess aqueous sodium hydroxide to the test-tube.

Record your observations.

~~When added excess NaOH the solution went white colourless with white precipitate~~ [2]

When added few drops white precipitate
when added excess NaOH clear colourless solution
with no precipitate.

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(a)(iv)

2(b)(i)

2(b)(ii)

2(b)(iii)

2(b)(iv)

2(c)

2(d)

Q2	Mark scheme
(a)(i)	pH 0–3
(a)(ii)	effervescence/bubbles/fizzes lighted splint 'pops'
(a)(iii)	effervescence/bubbles/fizzes limewater turns milky
(a)(iv)	white precipitate
(b)(i)	pH 10–14
(b)(ii)	white precipitate insoluble/no change
(b)(iii)	brown precipitate
(b)(iv)	green precipitate
(c)	sulfuric acid
(d)	calcium hydroxide

- (iii) Add aqueous silver nitrate to the third portion of solution R and leave to stand for about 5 minutes.

Record your observations.

Yellow ppt precipitate formed with colourless solution [2]

- (iv) Add a spatula measure of iron(II) sulfate crystals to the fourth portion of solution R and shake the mixture.

Record your observations.

Solution went dark green. [1]

- (c) Identify solution Q.

Sulphate Say Sulfuric acid. [2]

- (d) Identify solution R.

Aluminium (III) iodide [2]

[Total: 16]

Select
page

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(a)(iv)

2(b)(i)

2(b)(ii)

2(b)(iii)

2(b)(iv)

2(c)

2(d)

Q2 Mark scheme

(a)(i)	pH 0–3
(a)(ii)	effervescence/bubbles/fizzes lighted splint 'pops'
(a)(iii)	effervescence/bubbles/fizzes limewater turns milky
(a)(iv)	white precipitate
(b)(i)	pH 10–14
(b)(ii)	white precipitate insoluble/no change
(b)(iii)	brown precipitate
(b)(iv)	green precipitate
(c)	sulfuric acid
(d)	calcium hydroxide

- 2 You are provided with two solutions, solution Q and solution R.
Carry out the following tests on solution Q and solution R, recording all of your observations at each stage.

tests on solution Q

- (a) Divide solution Q into four equal portions in four test-tubes. Carry out the following tests.

- (i) Use pH indicator paper to measure the pH of the first portion of solution Q.

pH 1 [1]

- (ii) Add a 2 cm strip of magnesium ribbon to the second portion of solution Q. Test the gas given off.

Record your observations.

when magnesium was added it bubbled and when a lit splint was added it popped gas is hydrogen [2]

- (iii) Add a spatula measure of sodium carbonate to the third portion of solution Q. Test the gas given off.

Record your observations.

bubble put gas through limewater turned cloudy, gas is CO₂ [2]

- (iv) Add a few drops of dilute nitric acid and about 1 cm³ of aqueous barium nitrate to the fourth portion of solution Q.

Record your observations.

cloudy precipitate formed from colourless solution [1]

tests on solution R

- (b) Divide solution R into four equal portions in four test-tubes. Carry out the following tests.

- (i) Measure the pH of the first portion of solution R.

pH 9 [1]

- (ii) Add several drops of aqueous sodium hydroxide to the second portion of solution R and shake the test-tube.

Then add excess aqueous sodium hydroxide to the test-tube.

Record your observations.

When added in small amounts unreacted when in excess still unreactive [2]

Select
page

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(a)(iv)

2(b)(i)

2(b)(ii)

2(b)(iii)

2(b)(iv)

2(c)

2(d)

Q2	Mark scheme
(a)(i)	pH 0–3
(a)(ii)	effervescence/bubbles/fizzes lighted splint 'pops'
(a)(iii)	effervescence/bubbles/fizzes limewater turns milky
(a)(iv)	white precipitate
(b)(i)	pH 10–14
(b)(ii)	white precipitate insoluble/no change
(b)(iii)	brown precipitate
(b)(iv)	green precipitate
(c)	sulfuric acid
(d)	calcium hydroxide

- (iii) Add aqueous silver nitrate to the third portion of solution R and leave to stand for about 5 minutes.

Record your observations.

turned from colourless solution to dark brown then to light brown then finally stayed the same [2]

- (iv) Add a spatula measure of iron(II) sulfate crystals to the fourth portion of solution R and shake the mixture.

Record your observations.

turned clear colourless substance to dark cream solution [1]

- (c) Identify solution Q.

Hydrogen sulfate [2]

- (d) Identify solution R.

ammonium carbonate sulfite [2]

[Total: 16]

Select page

Your Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(a)(iv)

2(b)(i)

2(b)(ii)

2(b)(iii)

2(b)(iv)

2(c)

2(d)

Q2	Mark scheme
(a)(i)	pH 0–3
(a)(ii)	effervescence/bubbles/fizzes lighted splint 'pops'
(a)(iii)	effervescence/bubbles/fizzes limewater turns milky
(a)(iv)	white precipitate
(b)(i)	pH 10–14
(b)(ii)	white precipitate insoluble/no change
(b)(iii)	brown precipitate
(b)(iv)	green precipitate
(c)	sulfuric acid
(d)	calcium hydroxide

- 2 You are provided with two solutions, solution Q and solution R.
Carry out the following tests on solution Q and solution R, recording all of your observations at each stage.

tests on solution Q

- (a) Divide solution Q into four equal portions in four test-tubes. Carry out the following tests.

- (i) Use pH indicator paper to measure the pH of the first portion of solution Q.

pH 4.2 [1]

- (ii) Add a 2 cm strip of magnesium ribbon to the second portion of solution Q. Test the gas given off.

Record your observations.

Tested for hydrogen and popping sound was heard. Hydrogen is given off [2]

- (iii) Add a spatula measure of sodium carbonate to the third portion of solution Q. Test the gas given off.

Record your observations.

Tested for oxygen with a glowing splint and the splint relighted. Oxygen is present [2]

- (iv) Add a few drops of dilute nitric acid and about 1 cm³ of aqueous barium nitrate to the fourth portion of solution Q.

Record your observations.

Milky precipitate forms on top and when mixed becomes a solution [1]

tests on solution R

- (b) Divide solution R into four equal portions in four test-tubes. Carry out the following tests.

- (i) Measure the pH of the first portion of solution R.

pH 12 [1]

- (ii) Add several drops of aqueous sodium hydroxide to the second portion of solution R and shake the test-tube.

Then add excess aqueous sodium hydroxide to the test-tube.

Record your observations.

Nothing happens or No reaction [2]

Select
page

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(a)(iv)

2(b)(i)

2(b)(ii)

2(b)(iii)

2(b)(iv)

2(c)

2(d)

Q2	Mark scheme
(a)(i)	pH 0–3
(a)(ii)	effervescence/bubbles/fizzes lighted splint 'pops'
(a)(iii)	effervescence/bubbles/fizzes limewater turns milky
(a)(iv)	white precipitate
(b)(i)	pH 10–14
(b)(ii)	white precipitate insoluble/no change
(b)(iii)	brown precipitate
(b)(iv)	green precipitate
(c)	sulfuric acid
(d)	calcium hydroxide

(iii) Add aqueous silver nitrate to the third portion of solution R and leave to stand for about 5 minutes.

Record your observations.

Clear on top and solid has formed
at the bottom [2]

(iv) Add a spatula measure of iron(II) sulfate crystals to the fourth portion of solution R and shake the mixture.

Record your observations.

Dark black precipitate [1]

(c) Identify solution Q.

Calcium [2]

(d) Identify solution R.

Ammonium [2]

[Total: 16]

Select
page

Your
Mark

2(a)(i)

2(a)(ii)

2(a)(iii)

2(a)(iv)

2(b)(i)

2(b)(ii)

2(b)(iii)

2(b)(iv)

2(c)

2(d)

Q2	Mark scheme
(a)(i)	pH 0–3
(a)(ii)	effervescence/bubbles/fizzes lighted splint 'pops'
(a)(iii)	effervescence/bubbles/fizzes limewater turns milky
(a)(iv)	white precipitate
(b)(i)	pH 10–14
(b)(ii)	white precipitate insoluble/no change
(b)(iii)	brown precipitate
(b)(iv)	green precipitate
(c)	sulfuric acid
(d)	calcium hydroxide

Cambridge Assessment International Education
The Triangle Building, Shaftesbury Road, Cambridge, CB2 8EA, United Kingdom
t: +44 1223 553554
e: info@cambridgeinternational.org www.cambridgeinternational.org

Copyright © UCLES September 2017