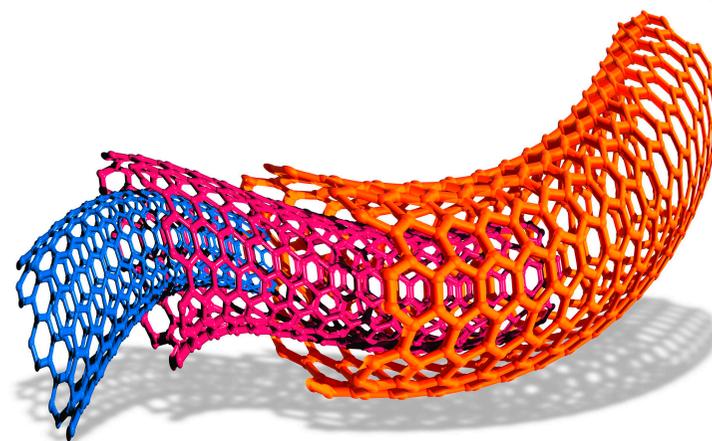


Interactive Example Candidate Responses

Paper 5 (May / June 2016), Question 2

Cambridge IGCSE™
Chemistry 0620



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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 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. ~~was~~ 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 ~~of the~~ drops of NaOH the solution went ~~white~~ colourless with ~~off~~ 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 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]

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 [2]

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

Record your observations.

it popped gas is hydrogen bubble put gas through limewater turned cloudy, gas is con [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]

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 ~~etc~~ 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]

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]

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]

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
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(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

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