

## Paper 1

Questions are applicable for both core and extended candidates

- 1 An aqueous sample of X is heated with aqueous sodium hydroxide and small pieces of aluminium. A gas is produced which turns damp red litmus paper blue.

Aqueous sodium hydroxide is added to a second aqueous sample of X. A pale green precipitate is observed.

What is X?

- A ammonium nitrate
- B chromium(II) chloride
- C iron(II) nitrate
- D iron(II) sulfate

- 2 A student tests an unknown compound M.

The compound:

- produces a lilac flame using a flame test
- produces a gas which turns limewater cloudy when dilute hydrochloric acid is added.

What is M?

- A sodium sulfate
- B sodium carbonate
- C potassium sulfate
- D potassium carbonate

- 3 The results of two separate tests on a white solid X are shown.

test	result
add dilute nitric acid	effervescence
add aqueous sodium hydroxide and warm	a gas is formed which turns damp red litmus paper blue

What is X?

- A aluminium carbonate
- B aluminium nitrate
- C ammonium carbonate
- D ammonium nitrate

- 4 Compound X is dissolved in water and two separate samples of the solution are tested.

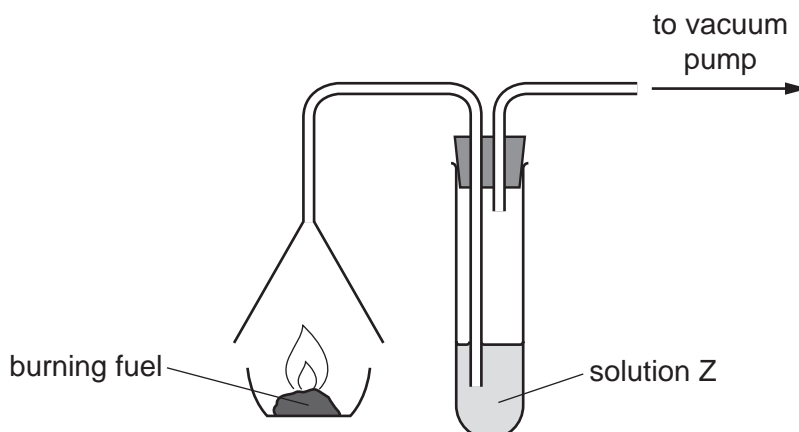
The results of the tests are shown.

test	observation
add aqueous sodium hydroxide	a white precipitate forms which is insoluble in excess
acidify with dilute nitric acid and add aqueous silver nitrate	a yellow precipitate forms

What is compound X?

- A** calcium chloride
- B** calcium iodide
- C** zinc chloride
- D** zinc iodide
- 5 The gases produced by a burning fuel are passed through solution Z using the apparatus shown.

The fuel contains compounds of sulfur.



Which row identifies solution Z and the result obtained when the fuel contains compounds of sulfur?

	solution Z	result
<b>A</b>	acidified potassium manganate(VII)	turns colourless
<b>B</b>	acidified potassium manganate(VII)	turns purple
<b>C</b>	litmus	bleached
<b>D</b>	litmus	turns blue

**6** Three separate samples of an aqueous compound T are tested.

The results of the tests are shown.

test	observation
acidify with dilute nitric acid, then add aqueous barium nitrate	white precipitate
add aqueous ammonia	white precipitate, soluble in excess
add aqueous sodium hydroxide	white precipitate, soluble in excess

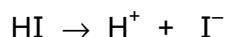
What is T?

- A** aluminium chloride
- B** aluminium sulfate
- C** zinc chloride
- D** zinc sulfate

## Paper 2

**Questions are applicable for both core and extended candidates  
unless indicated in the question**

- 7** Hydrogen iodide is dissolved in water.



Which row describes the final colours seen when the solution is tested with damp red litmus paper and with acidified aqueous potassium manganate(VII)?

	damp red litmus paper	acidified aqueous potassium manganate(VII)
<b>A</b>	blue	brown
<b>B</b>	blue	colourless
<b>C</b>	red	brown
<b>D</b>	red	colourless

- 8** The results of two tests on aqueous compound X are given.

test	result
warm with aluminium foil and aqueous sodium hydroxide	ammonia is produced
aqueous sodium hydroxide	brown precipitate

What is X?

- A** iron(III) nitrate  
**B** iron(II) nitrate  
**C** iron(III) sulfate  
**D** iron(II) sulfate
- 9** A gas is released at point Q, in the apparatus shown.



Which gas changes the colour of the damp universal indicator paper most quickly?

	gas	relative molecular mass
<b>A</b>	ammonia	17
<b>B</b>	carbon dioxide	44
<b>C</b>	chlorine	71
<b>D</b>	hydrogen	2

**10** Which metal compound produces a gas that turns limewater milky when it is heated with a Bunsen burner?

- A** copper(II) carbonate
- B** magnesium nitrate
- C** sodium sulfate
- D** zinc nitrate

**11** Acidified aqueous silver nitrate is added to a test-tube containing aqueous chloride ions.

The test-tube is then left in direct sunlight.

Which row describes the observations and explains what happens to the reaction mixture?

	observation on adding aqueous silver nitrate	observation after leaving in sunlight	explanation
<b>A</b>	yellow precipitate	precipitate dissolves	silver chloride forms
<b>B</b>	yellow precipitate	precipitate turns grey	silver ions are reduced
<b>C</b>	white precipitate	precipitate dissolves	silver chloride forms
<b>D</b>	white precipitate	precipitate turns grey	silver ions are reduced

**12** Three metal compounds, J, K and L, are heated using a Bunsen burner.

The results are shown.

J colourless gas produced, which relights a glowing splint

K colourless gas produced, which turns limewater milky

L no reaction

Which row identifies J, K and L?

	J	K	L
<b>A</b>	magnesium carbonate	potassium carbonate	potassium nitrate
<b>B</b>	magnesium carbonate	potassium nitrate	potassium carbonate
<b>C</b>	potassium nitrate	magnesium carbonate	potassium carbonate
<b>D</b>	potassium nitrate	potassium carbonate	magnesium carbonate