iG Chem ALL EQ P6 17w to 16m Gas tests 6marks and miscellaneous questions 32marks

Gas tests

Note: Most gas test questions are actually in the Ions Test revision pack, but are not included here because they cannot be completed without understanding the tests for ions part of the syllabus

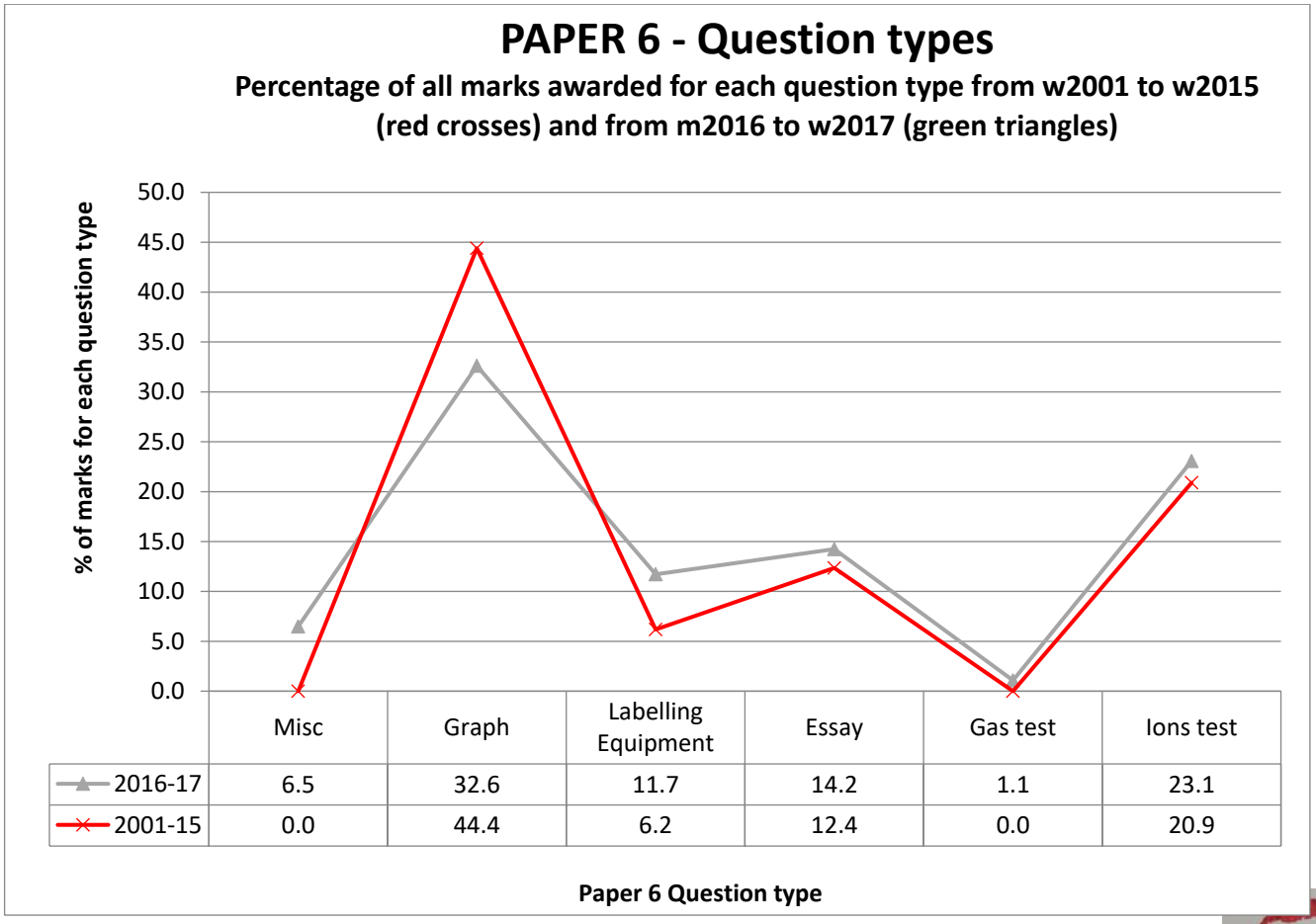
Experimental skills tested in Paper 5 Practical Test and Paper 6 Alternative to Practical

Candidates may be asked questions on the following experimental contexts:

- identification of ions and gases (Paper 5 will include notes on qualitative analysis for the use of candidates in the examination).

Tests for gases

gas	test and test result
ammonia (NH_3)	turns damp red litmus paper blue
carbon dioxide (CO_2)	turns limewater milky
chlorine (Cl_2)	bleaches damp litmus paper
hydrogen (H_2)	'pops' with a lighted splint
oxygen (O_2)	relights a glowing splint
sulfur dioxide (SO_2)	turns acidified aqueous potassium manganate(VII) from purple to colourless



Q# 1/ iGCSE Chemistry/Paper 6/2017/w/ Time Zone 2/

(ii) State the effect of a lighted splint on the hydrogen produced.

..... [1]

Q# 2/ iGCSE Chemistry/Paper 6/2017/m/ Time Zone 2/Q1

(c) Give a test for oxygen.

test .....

result .....

[1]

(d) The gas collected at the positive side turned limewater milky.

(i) Based on this observation, what gas was present?

..... [1]

Q# 3/ iGCSE Chemistry/Paper 6/2016/w/ Time Zone 1/Q1

(d) Give **one** test to distinguish between oxygen and hydrogen.

test .....

result with oxygen .....

result with hydrogen .....

[2]

Q# 4/ iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/Q2

(b) The gas produced in experiment 3 was tested with a lighted splint and the result recorded below.

test ...lighted splint.....

result ...popped.....

Name the gas given off in experiment 3.

..... [1]

Miscellaneous questions

AO3 Experimental skills and investigations

Candidates should be able to:

- demonstrate knowledge of how to safely use techniques, apparatus and materials (including following a sequence of instructions where appropriate)
- plan experiments and investigations
- make and record observations, measurements and estimates
- interpret and evaluate experimental observations and data
- evaluate methods and suggest possible improvements.

Weighting for assessment objectives

The approximate weightings allocated to each of the assessment objectives (AOs) are summarised below.

Assessment objectives as a percentage of the qualification

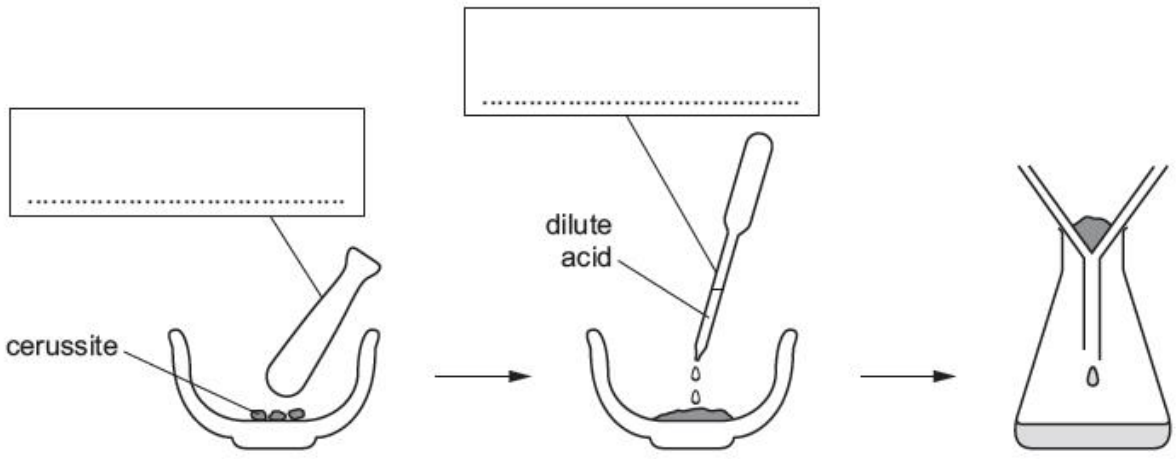
Assessment objective	Weighting in IGCSE %
AO1 Knowledge with understanding	50
AO2 Handling information and problem solving	30
AO3 Experimental skills and investigations	20

Assessment objectives as a percentage of each component

Assessment objective	Weighting in components %		
	Papers 1 and 2	Papers 3 and 4	Papers 5 and 6
AO1 Knowledge with understanding	63	63	0
AO2 Handling information and problem solving	37	37	0
AO3 Experimental skills and investigations	0	0	100

Topic **Chem 1 Q# 1/** iGCSE Chemistry/Paper 6/2017/w/ Time Zone 3/

1 Cerussite is a lead ore which contains lead(II) carbonate. A student obtained a solution of lead(II) nitrate from cerussite using the apparatus shown.



step 1 step 2 step 3

(e) Suggest how a sample of lead could be obtained from the solution of lead(II) nitrate.

.....

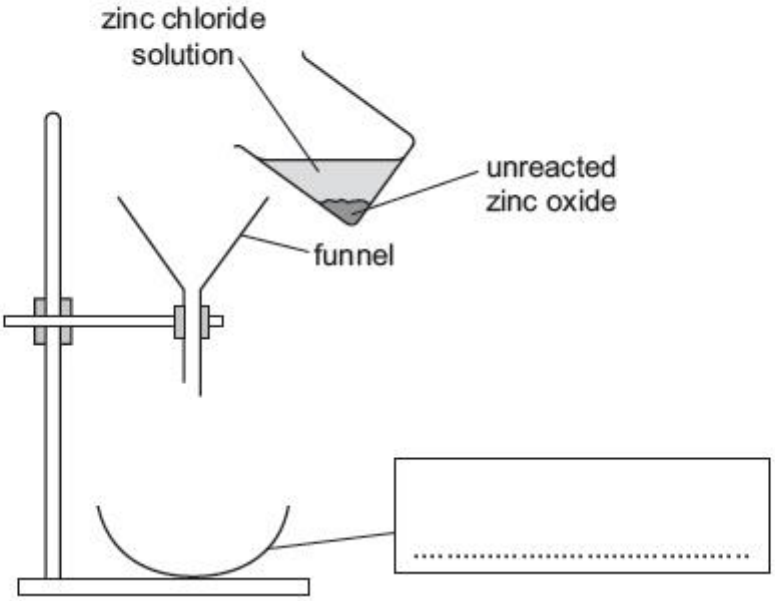
.....

.....

..... [2]

Topic **Chem 1 Q# 2/** iGCSE Chemistry/Paper 6/2017/w/ Time Zone 1/

1 A student reacted dilute hydrochloric acid with zinc oxide to prepare zinc chloride solution.
The diagram shows part of the procedure.



(d) Describe how crystals of zinc chloride could be obtained from the zinc chloride solution.

.....

.....

..... [3]

Topic **Chem 4 Q# 3/** iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/

1 Air is a mixture of gases. The diagram shows the apparatus used to find the percentage of oxygen in air.
50 cm^3 of air were passed backwards and forwards over excess heated copper until there was no further change. The apparatus was left to cool and the volume of gas remaining was 40 cm^3.

(d) From the results, work out the percentage of oxygen in the air.

..... % [2]

Topic **Chem 5 Q# 4/** iGCSE Chemistry/Paper 6/2017/m/ Time Zone 2/Q1

(e) A solution of dilute sulfuric acid was electrolysed for 1 hour.

Suggest why the pH of the solution **decreased** during the electrolysis.

.....

..... [2]

Topic **Chem 7 Q# 5/** iGCSE Chemistry/Paper 6/2017/s/ Time Zone 3/

(e) (i) Suggest a simple chemical test to show that the liquid collected is ethanol and **not** water.

..... [1]

Topic **Chem 7 Q# 6/** iGCSE Chemistry/Paper 6/2016/s/ Time Zone 2/Q1

(e) The colourless liquid is water

(ii) Give a chemical test for this liquid.

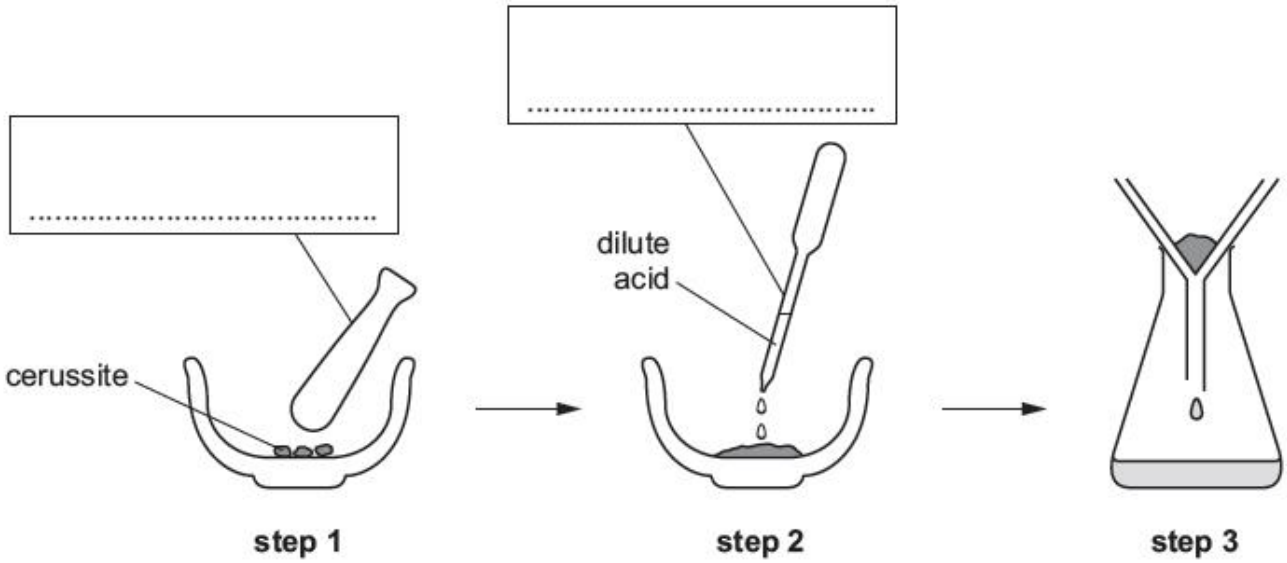
test .....

result .....

[2]

Topic **Chem 8 Q# 7/** iGCSE Chemistry/Paper 6/2017/w/ Time Zone 3/

1 Cerussite is a lead ore which contains lead(II) carbonate. A student obtained a solution of lead(II) nitrate from cerussite using the apparatus shown.



(c) Name the dilute acid used in **step 2**.

..... [1]

Topic **Chem 8 Q# 8/** iGCSE Chemistry/Paper 6/2017/s/ Time Zone 1/

4 A sample of furniture cleaner contains aqueous sodium chloride, aqueous ammonia and sand.

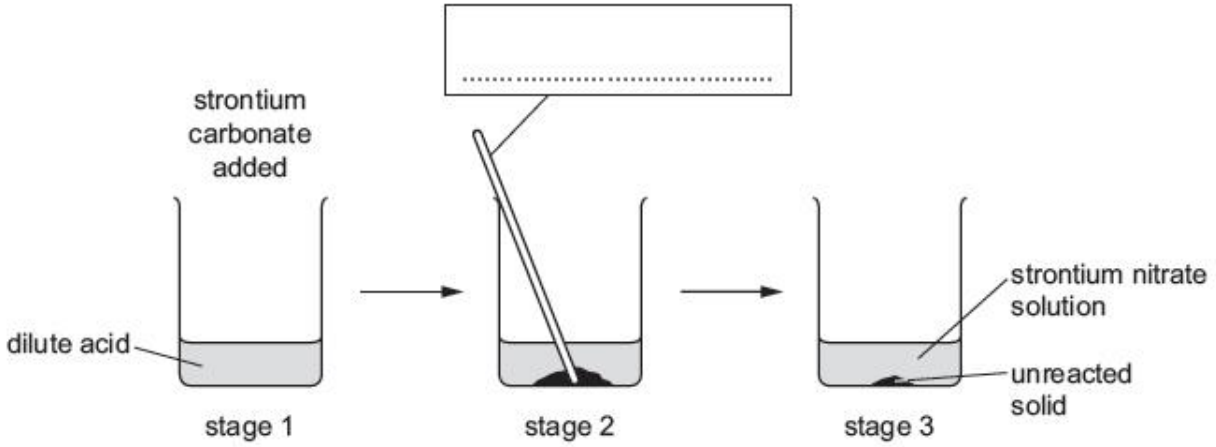
(a) Give a test to show the presence of ammonia in the mixture.

..... [1]

Topic **Chem 8 Q# 9/** iGCSE Chemistry/Paper 6/2017/s/ Time Zone 1/

1 A student prepared strontium nitrate crystals.

The diagram shows some of the stages in this preparation.



(a)

(iii) Name the dilute acid used.

..... [1]

(iv) Give **one** expected observation in stage 2.

..... [1]

(b) Why is heat **not** necessary in stage 2?

..... [1]

(c) Which of the reactants is in excess? Explain your answer.

.....

..... [2]

(d) Describe how crystals of strontium nitrate could be obtained from the mixture in stage 3.

.....

.....

..... [3]

Topic **Chem 10** **Q# 10/** iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/Q2

(c) *Experiment 4*

A measuring cylinder was used to pour 10 cm^3 of copper(II) sulfate solution into a boiling tube.
The temperature of the solution was measured.
1 g of magnesium was added to the boiling tube and the mixture stirred with a thermometer.
The maximum temperature reached by the mixture was measured.

Experiment 5

Experiment 4 was repeated using 1 g of iron instead of magnesium.
The observation was recorded below.

The solution turned colourless and a brown deposit formed.

(f) Explain the observations in experiment 5.

.....

.....

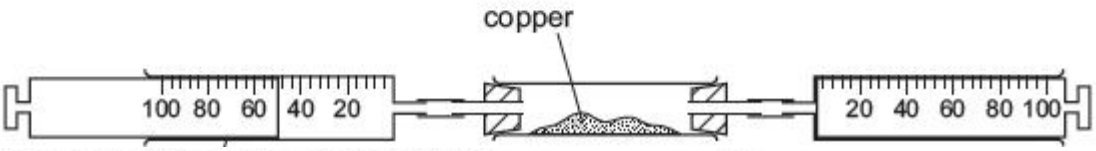
..... [2]

(g) Suggest why potassium was **not** used as one of the metals in these experiments.

..... [1]

Topic **Chem 10** **Q# 11/** iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/

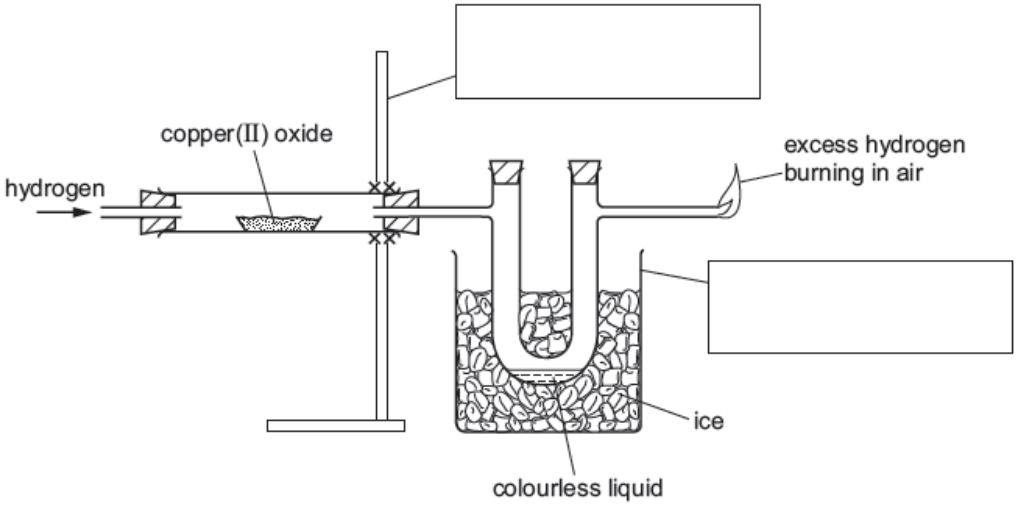
1 Air is a mixture of gases. The diagram shows the apparatus used to find the percentage of oxygen in air.
50 cm^3 of air were passed backwards and forwards over excess heated copper until there was no further change. The apparatus was left to cool and the volume of gas remaining was 40 cm^3.



(c) The colour of the copper changed from ..... to ..... . [2]

Topic **Chem 10** **Q# 12/** iGCSE Chemistry/Paper 6/2016/s/ Time Zone 2/

1 The diagram shows the apparatus used to reduce copper(II) oxide with hydrogen.



(b) Use an arrow to indicate where heat is applied. [1]

(c) The colour of the copper(II) oxide changes from ..... to ..... . [2]

Topic **Chem 14** **Q# 13/** iGCSE Chemistry/Paper 6/2016/w/ Time Zone 3/

(c) Give a test to show the presence of alkenes.

test .....

result .....

[2]

Mark Scheme

Tests for gases

Q# 1/ iGCSE Chemistry/Paper 6/2017/w/ Time Zone 2/

1(d)(ii)	'pops'	1

Q# 2/ iGCSE Chemistry/Paper 6/2017/m/ Time Zone 2/

1(c)	test: glowing splint result: relights	1
1(d)(i)	carbon dioxide	1

Q# 3/ iGCSE Chemistry/Paper 6/2016/w/ Time Zone 1/

1(d)	*lighted splint* no effect / brighter light for oxygen 'pops' for hydrogen **OR** *glowing splint* relights for oxygen no effect for hydrogen	 1 1 1 1

Q# 4/ iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/

2(b)	hydrogen;	1

Miscellaneous

Q# 1/ iGCSE Chemistry/Paper 6/2017/w/ Time Zone 3/

1(e)	**M1** add a more reactive metal (e.g. zinc / magnesium)	1
	M2 displaces lead / filter out lead	1

Q# 2/ iGCSE Chemistry/Paper 6/2017/w/ Time Zone 1/

1(d)	heat / boil / evaporate	1
	to crystallising point	1
	cool / leave to stand	1

Q# 3/ iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/

1(d)	volume of oxygen = 10 cm^3; % oxygen = 10/50 × 100 = 20%;	2 1 1

Q# 4/ iGCSE Chemistry/Paper 6/2017/m/ Time Zone 2/

1(e)	solution became more acidic / more concentrated	1
	water was broken down / electrolysed	1

Q# 5/ iGCSE Chemistry/Paper 6/2017/s/ Time Zone 3/

1(e)(i)	lighted splint ignites the liquid / test for water, e.g. add anhydrous copper(II) sulfate gives a negative result	1

Q# 6/ iGCSE Chemistry/Paper 6/2016/s/ Time Zone 2/

1(e)(ii)	test: anhydrous copper(II) sulfate;
	result: turns blue;
	OR
	test: cobalt(II) chloride (paper);
	result: turns pink;
		2
		1
		1
		
		1
		1

Q# 7/ iGCSE Chemistry/Paper 6/2017/w/ Time Zone 3/

1(c)	nitric (acid)	1

Q# 8/ iGCSE Chemistry/Paper 6/2017/s/ Time Zone 1/

4(a)	(red) litmus turns blue	1

Q# 9/ iGCSE Chemistry/Paper 6/2017/s/ Time Zone 1/

1(a)(iii)	nitric (acid)	1
1(a)(iv)	bubbles / fizz / effervescence	1
1(b)	the reaction is (fast) at room temperature	1
1(c)	strontium carbonate	1
	solid is left behind	1
1(d)	filter	1
	heat / evaporate	1
	to crystallising point / glass rod test / until saturation point	1

Q# 10/ iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/

2(f)	copper formed; iron is more reactive / displacement reaction;	2 1 1
2(g)	potassium is too reactive / dangerous;	1

Q# 11/ iGCSE Chemistry/Paper 6/2016/s/ Time Zone 3/

1(c)	orange / red / brown / pink; to black;	2 1 1

Q# 12/ iGCSE Chemistry/Paper 6/2016/s/ Time Zone 2/

1(b)	arrow(s) underneath copper oxide;	1
1(c)	black; to orange / red / brown / pink;	2 1 1

Q# 13/ iGCSE Chemistry/Paper 6/2016/w/ Time Zone 3/

1(c)	**M1** bromine (aqueous / in cyclohexane) **M2** turns colourless / decolourised	1 1