



2017 SCHOLARSHIP EXAMINATION

CHEMISTRY

Time: 30 minutes

Name: _____

School: _____

INSTRUCTIONS

Complete **ALL** questions in the spaces provided in this answer booklet.
Read the questions carefully.
A Periodic Table is provided.

1. Choose gases from this list to complete the word equations below.

carbon dioxide hydrogen nitrogen
oxygen sulphur dioxide

(a) sodium + water sodium hydroxide + (1)

(b) magnesium + magnesium oxide. (1)

(Total 2 marks)

2. Cassiterite is an ore of the metal tin.

(a) What is an ore?
.....

..... (2)

(b) Some metals are obtained by removing oxygen from the metal oxide.

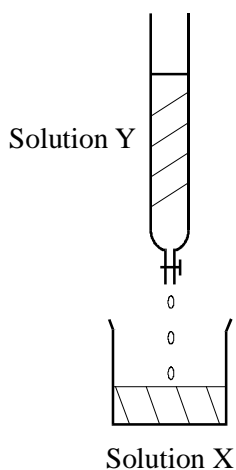
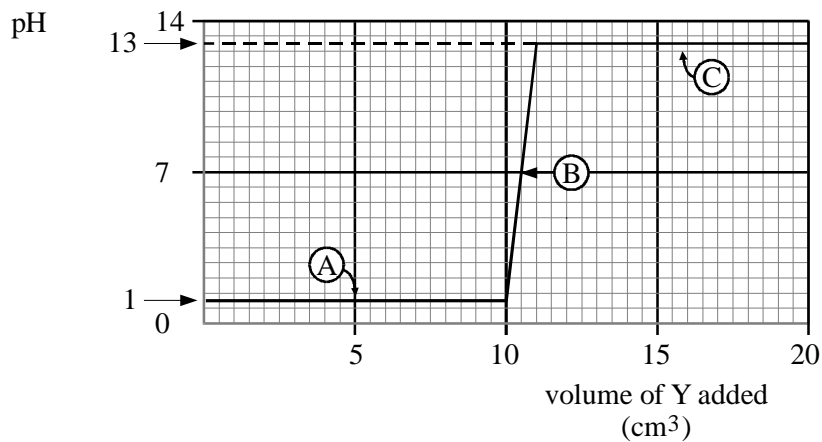
What name do we give to this chemical reaction?
..... (1)

(c) Name **one** metal which must be extracted from its melted ore by electrolysis rather than by using carbon.

..... (1)
(Total 4 marks)

3. Some students slowly add solution Y to solution X.

The graph shows what happens to the pH of the solution in the beaker as they do this.



(a) Choose words from this list to complete the sentences below.

acidic alkaline neutral

At point A on the graph the solution in the beaker is

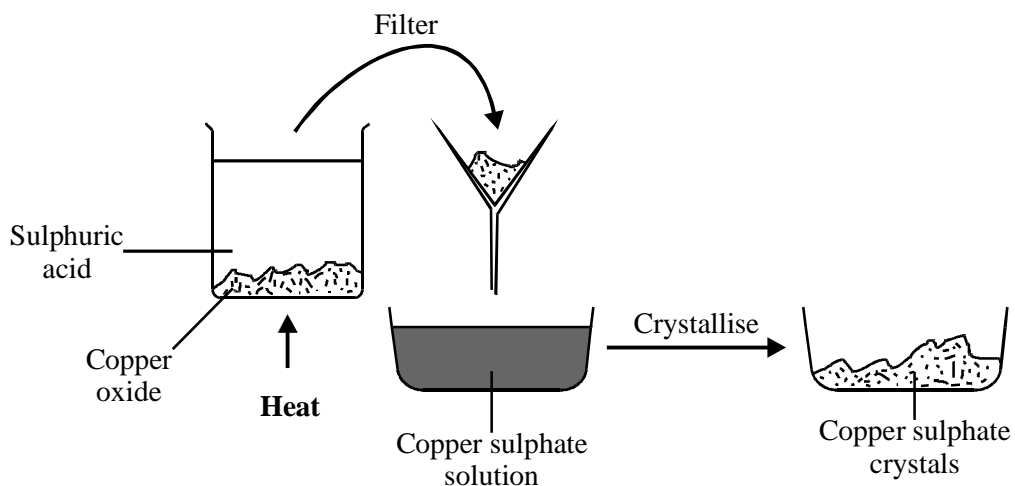
At point B on the graph the solution in the beaker is

At point C on the graph the solution in the beaker is

(2)

(Total 2 marks)

4. (a) The diagram shows one way of making crystals of copper sulphate.



- (i) Why was the solution filtered?

.....

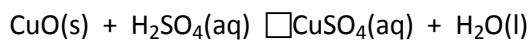
(1)

- (ii) How could you make the crystals form faster from the copper sulphate solution?

.....

(1)

- (iii) The chemical equation is shown for this reaction.



In the chemical equation what does (aq) mean?

.....

(1)

- (b) Blue copper sulphate crystals go white when warmed. How could you use the white copper sulphate as a test for water?



.....

.....

.....

(2)
(Total 5 marks)

5. (a) Sulphur is a yellow element. It is a non-metal.

- (i) Complete the sentence.

In an element, all the atoms

.....

.....

(1)

- (ii) Give **two** properties you would expect sulphur to have because it is a non-metal.

1.

.....

2.

.....

(2)

(b) Use the names of metals from the box to complete the table.

copper	iron	magnesium	manganese	zinc
--------	------	-----------	-----------	------

Use	Name of metal
for electric wiring in a house
for manhole covers
to galvanise iron

(3)

(c) Copper is used to make hot water pipes. Both iron and steel are cheaper.

Suggest **two** reasons why copper is used rather than iron or steel.

1.

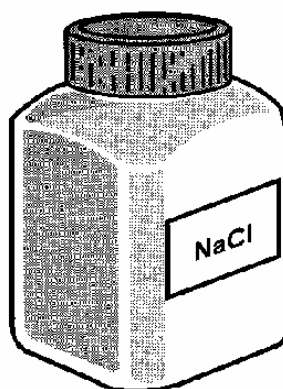
.....

2.

.....

(2)

(d) The drawing shows a container of a compound called sodium chloride.



(i) Which other element has combined with sodium to form this compound?

.....

(1)

(ii) For every atom of sodium, how many atoms of the other element have combined with it?

.....

(1)

(Total 10 marks)

6. Use the Formulae of Some Common Ions table on the Data Sheet to help you to answer this question.

Acids react with alkalis to form salts and water.

Complete the table below by writing in the name and formula of the salt formed in each reaction.

The first one has been done for you.

Acid	Alkali	Salt	Formula of salt
Hydrochloric acid	Sodium hydroxide	Sodium chloride	NaCl
Nitric acid	Sodium hydroxide		
Sulphuric acid	Potassium hydroxide		

(Total 4 marks)

7. There are millions of different substances that make up our world. All these substances are made from chemical elements.

(a) What is an element?

.....

.....

(1)

(b) Many substances are compounds. What is a compound?

.....
.....
.....
.....

(2)
(Total 3 marks)

8. (a) Burning fuels changes the Earth's atmosphere. The new substances produced are mainly gases.
The following is a list of types of reaction.

- combustion** **cracking** **electrolysis**
fermentation **neutralisation** **reduction**

Choose, from the list, the word which has the same meaning as burning.

.....

(1)

(b) The table shows the gases formed when four fuels, **A** to **D**, are completely burned in air.

FUEL	GAS FORMED ON BURNING		
	CARBON DIOXIDE CO ₂	WATER VAPOUR H ₂ O	SULPHUR DIOXIDE SO ₂
A	✓	✓	✗
B	✗	✓	✗
C	✓	✗	✗
D	✓	✓	✓

Which fuel, **A** to **D**, is hydrogen, H₂?

(1)
(Total 2 marks)

9. Crude oil and natural gas are mixtures of hydrocarbons. They are obtained from wells drilled into rocks where they are trapped.

(a) (i) What is the name of the process used to separate the different hydrocarbons in crude oil?

.....

(1)

(ii) Methane is one of the gases obtained when crude oil is separated.

Give the name of another hydrocarbon gas obtained from this process.

.....

(1)

(b) A fuel used in gas cookers is natural gas. It is mainly methane, CH₄.

(i) Complete the word equation for the complete combustion of methane.

methane + oxygen +

(2)

(ii) What different gas is produced by the incomplete combustion of methane?

.....

(1)

(Total 5 marks)