Rosary School – Marj Elhamam
Worksheet (2)

Name: Answers Date: / / 2025

Grade: 8 (A,B,C,D) Subject: Chemistry

Achievement Test Questions

Question one:

Boron is an element in Group 3 of the Periodic Table.

An atom of boron can be represented as $^{11}_{5}B$

(a) Use numbers from the box to complete the sentences about this atom of boron.

3	5	6	11	16

Each number may be used once, more than once or not at all.

(i) The atomic number of boron is 5

(ii) The mass number of boron is 11

(iii) This atom of boron contains 5 protons.

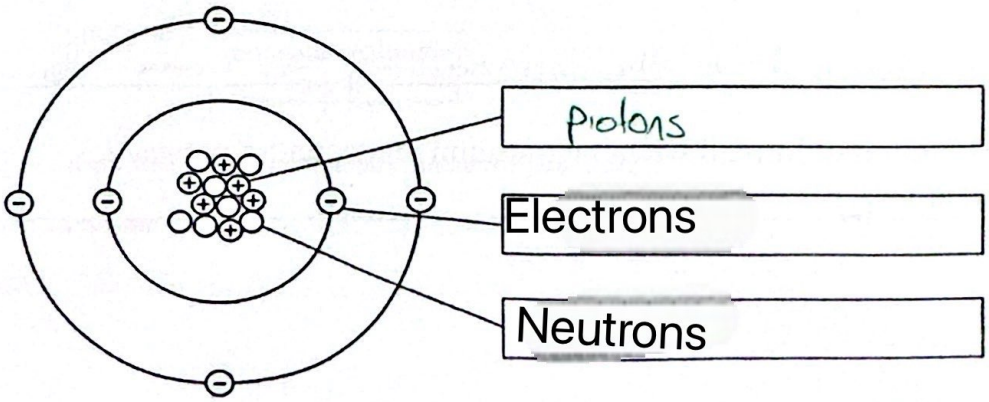
(b)

The diagram shows the particles in an atom of an element.

The box gives the names of some particles.

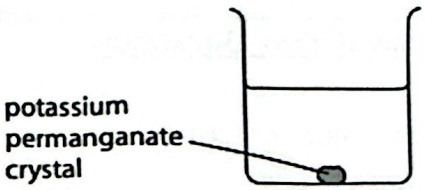
electron	ion	molecule	neutron	proton

Use words from the box to label the diagram.



Question two:

A potassium permanganate crystal is placed in a beaker of water.



(a) The formula of potassium permanganate is $KMnO_4$

How many different types of atom are in $KMnO_4$?

- ☐ (A) 3
- ☐ B 4
- ☐ C 6
- ☐ D 7

(b) Potassium permanganate can be used as an oxidising agent.

State what is meant by the term **oxidising agent.**

A substance that releases oxygen in a chemical reaction.

(c) In fireworks, magnesium powder reacts quickly with oxygen in the air.
During this reaction heat energy is produced.

i) Explain why this reaction is exothermic in terms of bond breaking and bond making.

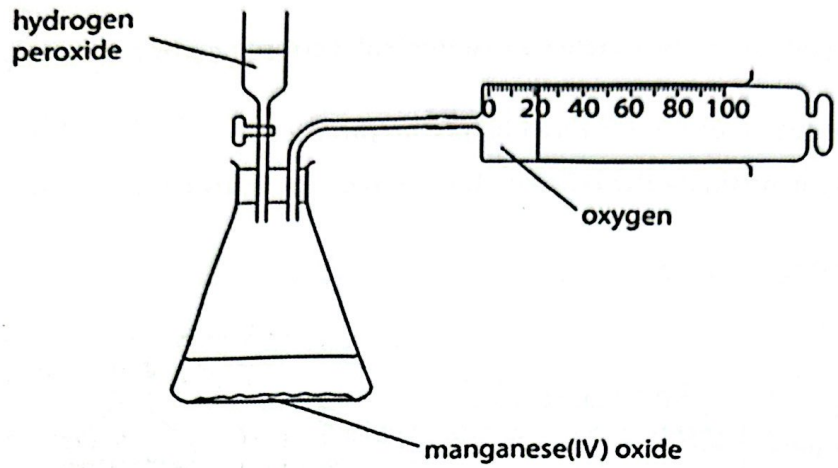
energy is released to the surrounding to make new bonds

ii) Name the compound formed when magnesium reacts with oxygen.

magnesium oxide.

Question three:

The apparatus in the diagram is used to collect the oxygen produced by the decomposition of hydrogen peroxide, H_2O_2



(a) Describe a test to show that the gas collected in the syringe is oxygen.

use a glowing splint, it should relights

(b) Hydrogen peroxide is an oxidising agent

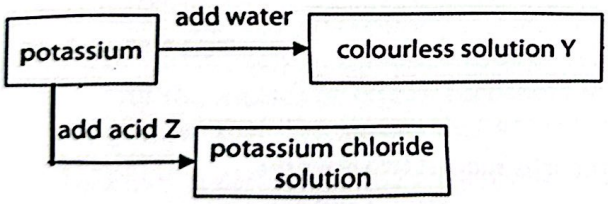
State and explain the effect of it on the rate of this reaction.

The more oxygen the faster the reaction, the oxidising Agent provide the reaction with more oxygen.

Question four:

This question is about elements in Groups 1 and 7 of the Periodic Table.

The diagram shows two ways in which potassium can be converted into potassium chloride.



Give the names of colourless solution Y and acid Z.

colourless solution Y potassium hydroxide.

acid Z hydrochloric acid.

Question five:

A solution of copper sulfate can be made by reacting solid copper carbonate with dilute sulfuric acid.

During the reaction bubbles of carbon dioxide gas are produced.

Eight students plan to investigate the reaction between copper carbonate and dilute sulfuric acid.

They are provided with

total mass of plastic container and copper carbonate = 10.0 g

dilute sulfuric acid

This is their method:

- place a known volume of dilute sulfuric acid in a beaker
- add a spatula of copper carbonate to the acid
- add further small amounts of copper carbonate until the reaction ends and excess copper carbonate is seen in the beaker
- weigh the plastic container and remaining copper carbonate.

(a) They use a small beaker to measure the known volume of dilute sulfuric acid.

Name a more suitable piece of apparatus they could use.

(1)

measuring Cylinder

(b) The students want to speed up the reaction.

Without changing the acid or the copper carbonate, suggest **two** ways the students could speed up the reaction.

(2)

1 stir the solution

2 heat up the solution,

(c) When the reaction ends, the students see excess copper carbonate in the beaker.

Give **one** other way in which they could see when the reaction ends.

(1)

when no more bubbles are produced.

(d) How could they remove the excess solid copper carbonate?

(1)

filtration.

(e) Complete the table to show the mass of copper carbonate added by Student 8.

(1)

	Volume of acid used (cm^3)	Mass of container and copper carbonate		Mass of copper carbonate added (g)
		at start (g)	at end (g)	
Student 1	15	10.0	9.05	0.95
Student 2	20	10.0	8.70	1.30
Student 3	25	10.0	8.40	1.60
Student 4	30	10.0	7.80	2.20
Student 5	35	10.0	7.75	2.25
Student 6	40	10.0	7.40	2.60
Student 7	45	10.0	7.10	2.90
Student 8	50	10.0	6.75	3.25

(f) A teacher says:

"All the masses of copper carbonate in the table are probably greater than the masses that actually reacted."

Look back at the method and suggest why the teacher's statement is likely to be correct.

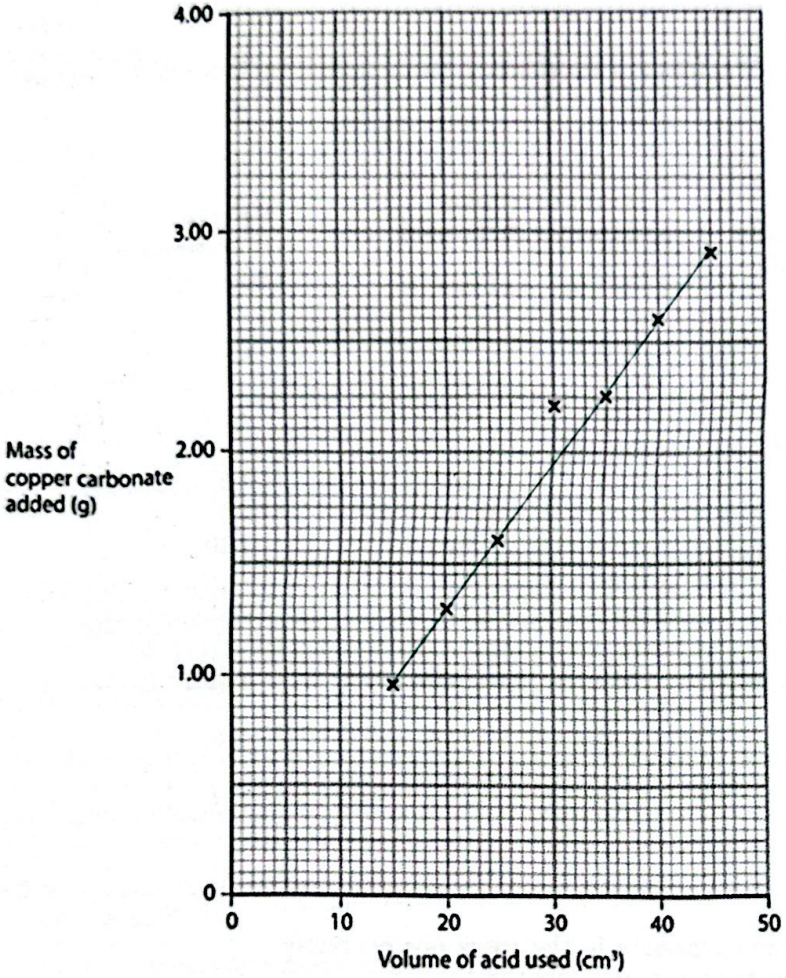
(1)

excess copper carbonate is observed in the beaker when the reaction ends

(g) The students' results are shown on the grid below.

(i) On the grid, plot your calculated value for the mass of copper carbonate added by Student 8.

(1)



(ii) Student 4's result is anomalous.
Ignore this result and draw a line of best fit through the remaining points.

(1)

(iii) Suggest a possible mistake, made by Student 4, to cause the anomalous result.

(1)

student might have measured the mass of Copper Carbonate incorrectly or used different Concentration of acid.

(h) What is the relationship between the volume of acid used and the mass of copper carbonate used?

(1)

direct proportional, as the volume of acid used increases, the mass of Copper Carbonate added also increases.