



**Week 2 Learning Check
Chemistry Foundation**

Name: _____

Class: _____

Date: _____

Time: **30 minutes**

Marks: **30 marks**

Comments:

Q1. Use the periodic table on the Data Sheet to help you to answer these questions.

(a) Write the symbol for helium.

(1)

(b) Write the name of an element in Group 4.

(1)

(c) Write the name of the element which has a relative atomic **mass** of 64.

(1)

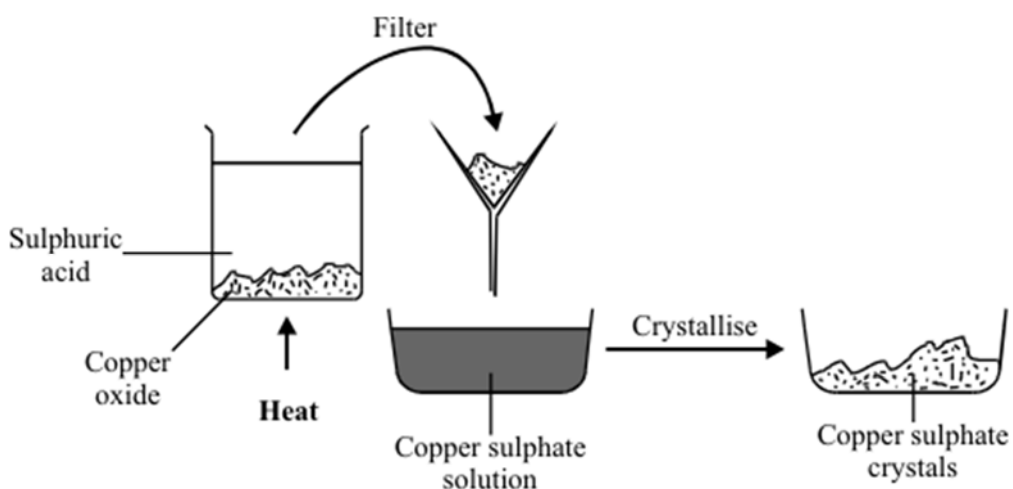
(d) Write the name of the element with the next highest atomic number after Te (tellurium) in the periodic table.

(1)

(Total 4 marks)

Q2.

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



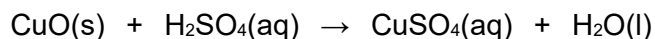
(i) Why was the solution filtered?

(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)

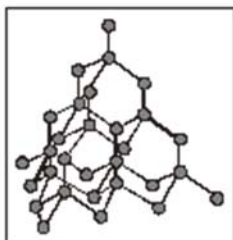
(Total 5 marks)

Q3.

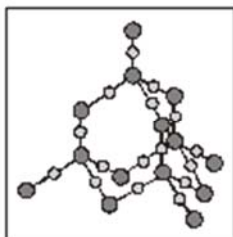
This question is about giant structures. Diamond, graphite and silicon dioxide all have giant structures.

(a) The diagrams show the structures of these three substances.

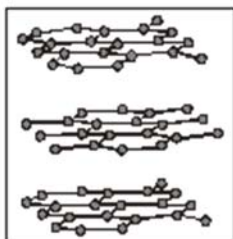
Draw a line from each structure to its name.



Silicon dioxide



Graphite



Diamond

(b) Complete the sentences using words from the box.

covalent	four	hard	ionic
shiny	soft	three	two

(i) Diamond, graphite and silicon dioxide have high melting points because all the atoms in their structures are joined by strong _____ bonds.

(1)

(ii) In diamond each atom is joined to _____ other atoms.

(1)

(iii) Diamond can be used to make cutting tools because it has a rigid structure which makes it very _____

(1)

(iv) In graphite each atom is joined to _____ other atoms.

(1)

(v) Graphite can be used to make pencils because it has a structure which makes it _____

(1)

(c) When a diamond is heated to a high temperature and then placed in pure oxygen it burns. Carbon dioxide is the only product.

Name the element in diamond. _____

(1)

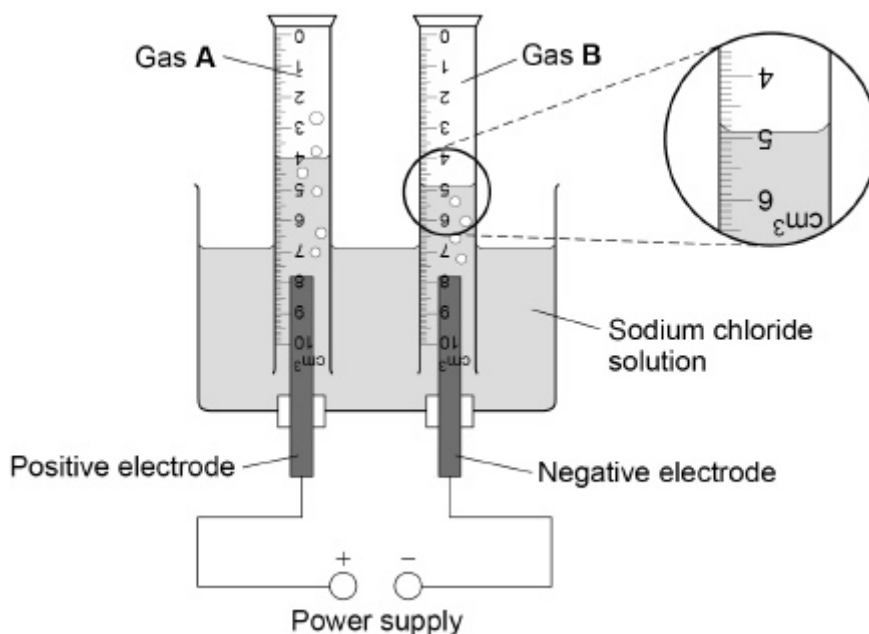
(Total 8 marks)

Q4.

A student investigated the electrolysis of sodium chloride solution.

Figure 1 shows the apparatus used.

Figure 1



- (a) **Figure 1** shows the volume of gas **B** collected in 10 minutes.

What is the volume of gas **B**?

Volume of gas **B** = _____ cm³

(1)

- (b) The table shows the student's results using sodium chloride solution of concentration 30 g/dm³

Experiment	Volume of gas B collected in 10 minutes in cm ³
1	2.2
2	2.2
3	2.0

Calculate the mean volume of gas **B** collected in 10 minutes.

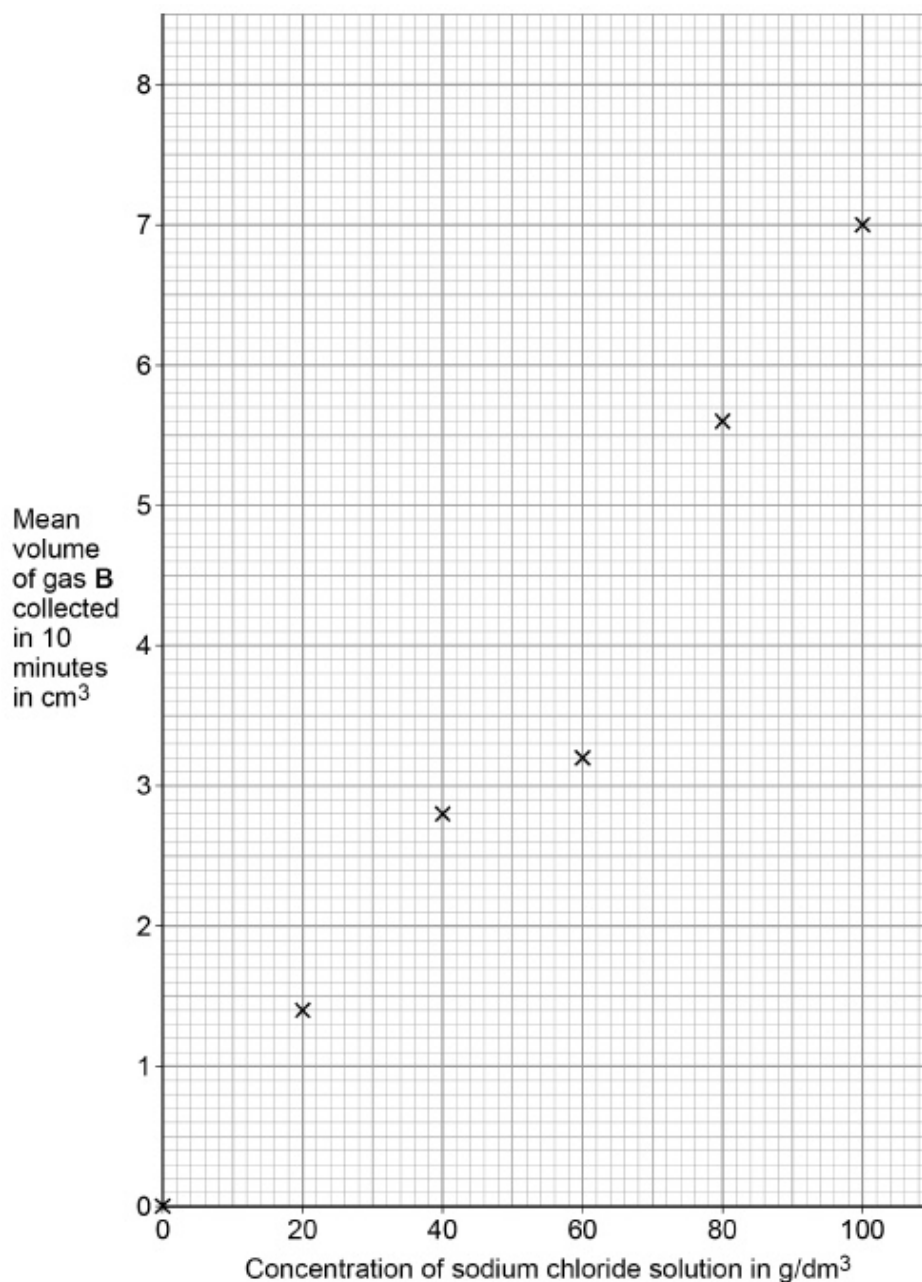
Mean volume = _____ cm³

(2)

The student repeated the experiment using different concentrations of sodium chloride solution.

Figure 2 shows some of the student's results.

Figure 2



(c) One point on **Figure 2** is anomalous.

What is the concentration and volume of the anomalous point?

Give a reason for your choice.

Concentration _____ g/dm³

Volume _____ cm³

Reason _____

(2)

(d) Describe the trend shown on **Figure 2**.

(1)

(e) Draw **one** line from each type of variable to the description of the variable in the experiment.

Type of variable	Description of variable in the experiment
	Concentration of sodium chloride solution
	Power supply
Dependent variable	Temperature of solution
Independent variable	Volume of gas collected
	Volume of sodium chloride solution

(2)

Sodium chloride solution contains sodium ions (Na^+) and chloride ions (Cl^-).

(f) Sodium chloride solution is electrolysed.

Explain why the sodium ions are attracted to the negative electrode.

(2)

(g) Complete the sentence.

Choose the answer from the box.

are too big are too small cannot move have delocalised electrons

Solid sodium chloride does **not** conduct electricity because

the ions _____ .

(1)

(h) Which **two** gases are produced during the electrolysis of sodium chloride solution?

Tick **two** boxes.

Carbon dioxide

Carbon monoxide

Chlorine

Hydrogen

Nitrogen

(2)

(Total 13 marks)

Mark schemes

Q1.

- (a) He 1
- (b) carbon / silicon / germanium / tin / lead
accept correctly written symbols C / Si / Ge / Sn / Pb 1
- (c) copper
accept Cu 1
- (d) iodine
accept I or I₂ 1

[4]

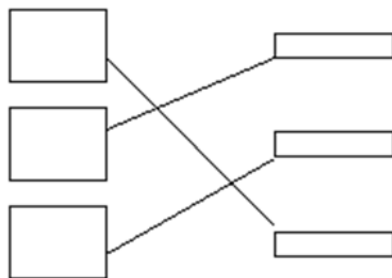
Q2.

- (a) (i) to remove or separate copper oxide
accept to remove or separate unreacted or excess base
accept to remove or separate insoluble solids 1
- (ii) heat (the solution)
accept heat the water
accept evaporate the water
rapid cooling/cool to lower temperature
accept boil the water or solution
not increase surface area, put in draught
not increase the temperature 1
- (iii) aqueous
accept in water
accept solution
not soluble in water 1
- (b) add water/liquid/solution 1
- colour changes to blue 1

[5]

Q3.

(a)



*all three lines correct gains 2 marks
one or two correct gains 1 mark
if there are more than 3 lines then lose mark for each extra line*

2

(b) (i) covalent

1

(ii) four

1

(iii) hard

1

(iv) three

1

(v) soft

1

(c) carbon

accept C

1

Q4.

(a) 4.9 (cm³)

1

$$\frac{2.2 + 2.0 + 2.2}{3}$$

(b)

1

2.1

an answer of 2.1(3333...0 scores 2 marks

1

(c) (concentration) 60 (g / dm³)
and
(volume) 3.2 (cm³)

1

would not be on the line of best fit

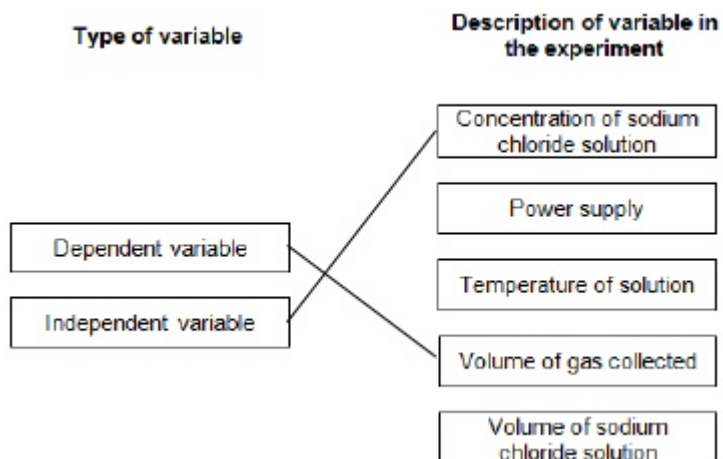
allow does not fit the pattern

1

(d) as the concentration of sodium chloride solution increases, the volume of gas collected increases

1

(e)



1
1

(f) (as) opposite charges attract

1

(and sodium ions) are positive

1

(g) cannot move

1

(h) chlorine

1

hydrogen

1

[13]

Examiner reports

Q1.

This question scored highly for most candidates. The most common reason for not gaining a mark was to write HE instead of He as the symbol for Helium.

A large number of candidates chose xenon rather than iodine. This was probably because they were looking at the figure for atomic mass rather than atomic number.

Q2.

Double Award only

Even the first question produced many vague answers with no mention of copper oxide or insoluble solids. The main incorrect answers included 'to remove crystals'. Both heating and cooling were allowable answers in (a) (ii). Many candidates did not know the meaning of (aq). Most thought incorrectly that it indicated a liquid. The answers to part (b) displayed that many candidates appeared not to have read the question correctly. Most of their answers included 'use litmus', 'test the pH', 'measure the boiling point' or 'use cobalt chloride paper'. Some candidates even thought that heating and cooling caused the colour change.

Q3.

Part (a) was well answered with virtually all of the candidates gaining at least one of the two marks and over half gaining both marks. Diamond was the best known of the three structures. For part (b) the type of bonding in part (b)(i) and the properties in parts (b)(iii) and (b)(v) were well known. Less well known were the number of bonds to each carbon in graphite and diamond.

A wide range of answers were seen in part (c) which included references to metals, non-metals and a number of different elements. This part highlights the importance of reading the question carefully since the answer can be worked out from the information given in the question.