

1. An alloy is a mixture of elements.  
The table shows the mass of each element present in 100 g of five different alloys, **bronze**, **solder**, **steel**, **stainless steel** and **brass**.

| alloy                  | mass of each element in 100 g of alloy |         |            |          |            |          |              |            |
|------------------------|--|---------|------------|----------|------------|----------|--------------|------------|
|                        | lead (g)                               | tin (g) | copper (g) | zinc (g) | carbon (g) | iron (g) | chromium (g) | nickel (g) |
| <b>bronze</b>          |  | 4       | 95         | 1        |            |          |              |            |
| <b>solder</b>          | 62                                     | 38      |            |          |            |          |              |            |
| <b>steel</b>           |  |         |            |          | 1          | 99       |              |            |
| <b>stainless steel</b> |  |         |            |          |            | 70       | 20           | 10         |
| <b>brass</b>           |  |         | 67         | 33       |            |          |              |            |

- (a) Which **alloy** in the table above contains an element which is a non-metal?

.....

1 mark

- (b) Which **two alloys** in the table contain only **two metals**?

..... and .....

1 mark

- (c) Another alloy called nichrome contains only the elements chromium and nickel.  
100 g of nichrome contains 20 g of chromium.

How much nickel does it contain?

..... g

1 mark

(d) Before 1992, two-pence coins were made of bronze. Steel rusts but bronze does **not** rust.

(i) Why does bronze **not** rust?  
Use information in the table above to help you.

.....  
.....

1 mark

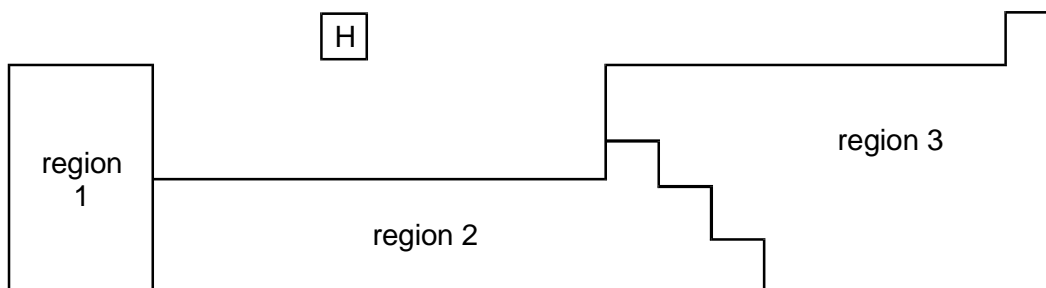
(ii) Rusting requires water and a gas from the air. Give the name of this gas.

.....

1 mark

maximum 5 marks

2. The diagram shows an outline of part of the Periodic Table of Elements.



(a) What is the name of the element with the symbol H?

.....

1 mark

(b) In which regions of the Periodic Table are the following types of element found?

(i) non-metals (such as oxygen and chlorine);

region .....

1 mark

(ii) very reactive metals (such as sodium and potassium);

region .....

1 mark

(iii) less reactive metals (such as copper and zinc).

Region .....

1 mark

(c) Why is copper sulphate **not** found in the Periodic Table?

.....  
.....

1 mark

(d) An iron nail is placed into some blue copper sulphate solution.  
A reaction takes place between the iron and the copper sulphate.

(i) Complete the word equation for the reaction.

iron + copper sulphate → ..... + .....

1 mark

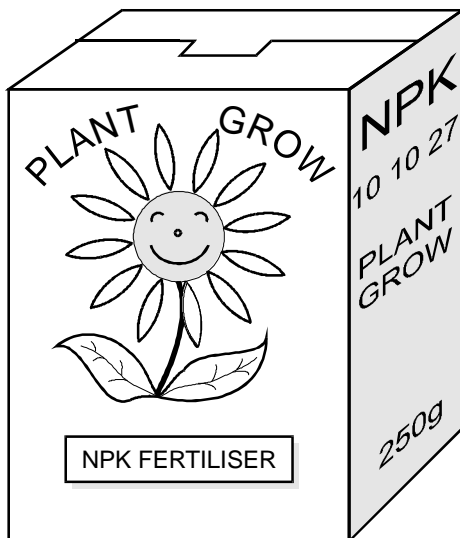
(ii) Describe **one** change you would see on the surface of the nail.

.....  
.....

1 mark

Maximum 7 marks

3. The drawing shows the label on a box of fertiliser for houseplants.



(a) To maintain healthy growth of their potted plants, people have to keep adding fertiliser to the soil. Explain why they need to keep adding fertiliser.

.....  
 .....

1 mark

(b) Part of the Periodic Table is shown below. The three elements N, P and K shown on the fertiliser label are also shown in the table.

|          |    |   |    |    |          |    |    |    |
|----------|----|---|----|----|----------|----|----|----|
|          |    | H |    |    |          | He |    |    |
| Li       | Be |   | B  | C  | <b>N</b> | O  | F  | Ne |
| Na       | Mg |   | Al | Si | <b>P</b> | S  | Cl | Ar |
| <b>K</b> | Ca |   | Ga | Ge | As       | Se | Br | Kr |

(i) The element N is nitrogen. What are the names of the other **two** elements?

P .....

K .....

2 marks

- (ii) Give the symbol for the most reactive metal shown in this part of the Periodic Table.

.....

1 mark

Maximum 4 marks

4. A section of the periodic table of elements is shown below.

|   |
|---|
| H |
|---|

|    |    |    |    |   |   |    |    |
|----|----|----|----|---|---|----|----|
|    |    |    |    |   |   |    | He |
| Li | Be | B  | C  | N | O | F  | Ne |
| Na | Mg | Al | Si | P | S | Cl | Ar |

- (a) Where in this section of the periodic table are the metals found?

.....

1 mark

- (b) Sodium chloride is formed when sodium and chlorine combine together in a chemical reaction.

Write the symbols for sodium and chlorine.

sodium .....

chlorine .....

2 marks

- (c) The formula for a substance is MgS. What is the name of this substance?

.....

1 mark

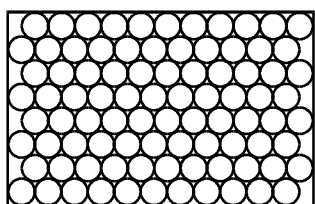
- (d) Give the name of one element in the table above which is a gas at room temperature and in which the atoms are joined together in molecules.

.....

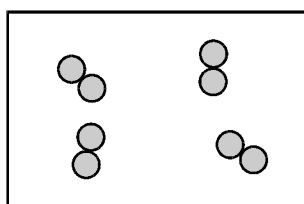
1 mark

Maximum 5 marks

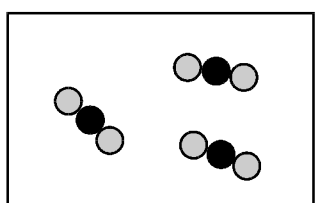
5. The diagrams represent the arrangement of atoms or molecules in four different substances, A, B, C and D.



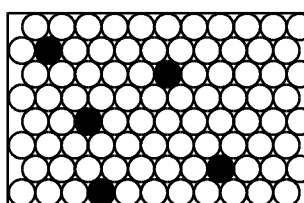
A



B



C



D

*not to scale*

Each of the circles, ○, ● and ● represents an atom of a different element.

- (a) (i) Which substance is a compound?

.....

1 mark

- (ii) Which substance is a mixture?

.....

1 mark

- (iii) Which **two** substances are elements?

..... and .....

1 mark

(iv) Which **two** substances could be good thermal conductors?

..... and .....

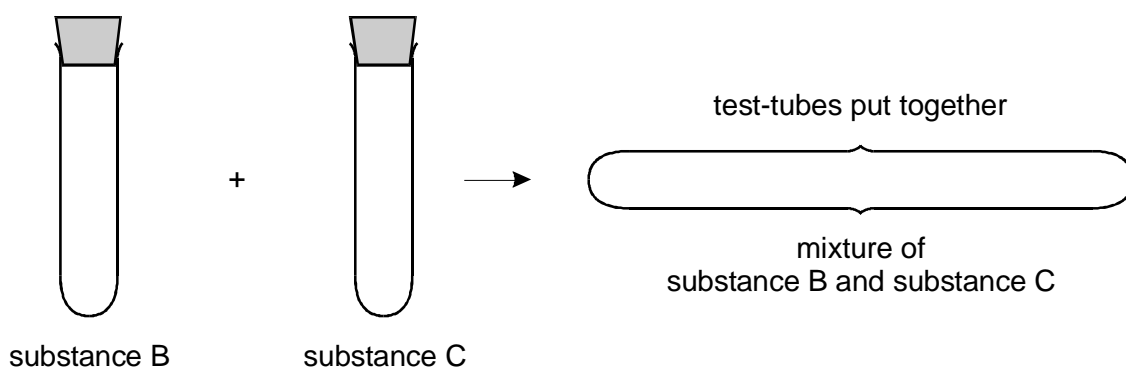
1 mark

(v) Which substance could be carbon dioxide?

.....

1 mark

(b) The following experiment was set up. Test-tubes containing substances B and C were placed together as shown. The substances did **not** react. They were left for five minutes.

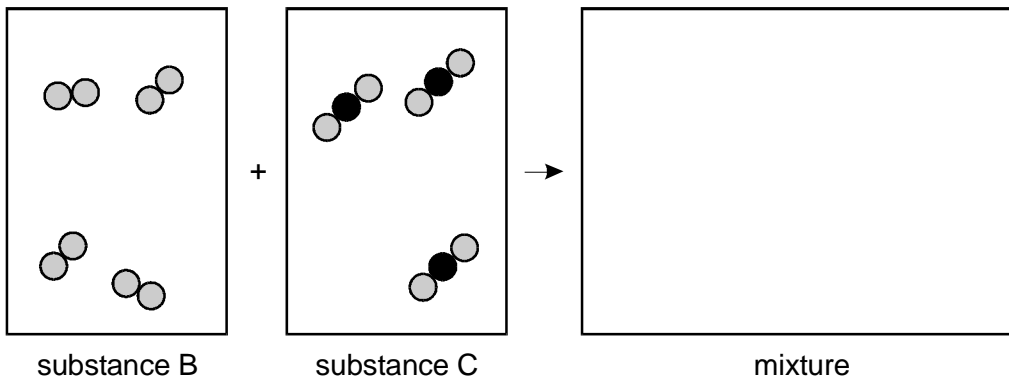


(i) How many molecules are there in the mixture compared to the total number in substances B and C?

.....

1 mark

(ii) Complete the diagram which is a model of this experiment.



1 mark

Maximum 7 marks