

Chemistry

Question 4

(52)

For
Examiner
use only

(1) | (2)

- (a) Give **two different properties** of the element magnesium compared to the compound magnesium oxide.

One _____

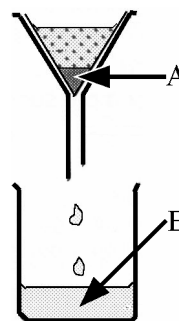
Two _____

- (b) What **effect** has acid rain on limestone? Explain this **effect**.

What? _____

Explain _____

- (c) A mixture of sand and salt was stirred up with water and then filtered as shown in the diagram.



- (i) Substance **A** was retained by the filter paper. Name **A**.

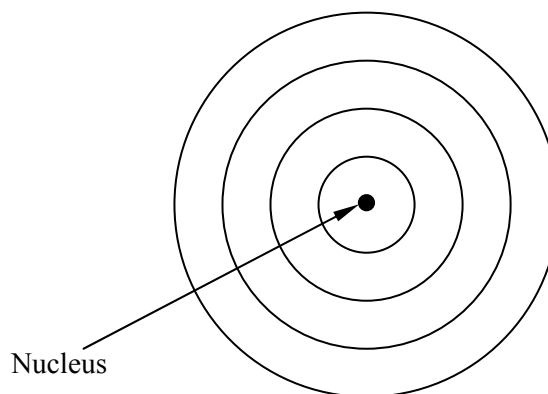
A _____

- (ii) Substance **B** was passed through the filter paper. Name **one constituent** of **B**.

B _____

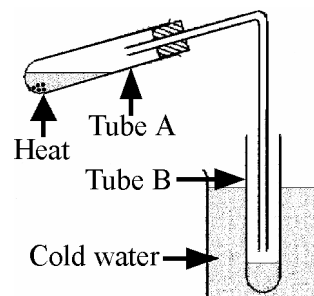
- (d) A potassium atom has atomic number 19 and a mass number of 39.

Complete the diagram using dots or crosses to clearly show the arrangement of electrons in the potassium atom.



(1) (2)

- (e) Hard water in test tube A was heated and some water evaporated from it and condensed in test tube B. Is the water in test tube B **hard or soft**? Give a **reason** for your answer,



Is? _____

Reason _____

- (f) Name **two processes** used in the treatment of water for safe use in our homes.

Process one _____

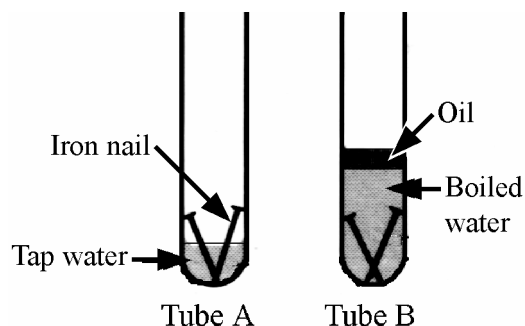
Process two _____

- (g) Metals conduct two forms of energy very well. Name the **two forms of energy**.

Energy one _____

Energy two _____

- (h) A pupil performed an experiment on the rusting of iron using the apparatus shown in the diagram. The iron nails in one of the tubes rusted after a few days, while the nails in the other test tube did not rust.



- (i) In **which tube** did the nails **rust**?

Which? _____

- (ii) Why was **boiled water** used in tube B?

Why? _____

- (iii) What is the **function** of the oil in tube B?

What? _____

- (iv) What **conclusion** can be drawn from this experiment?

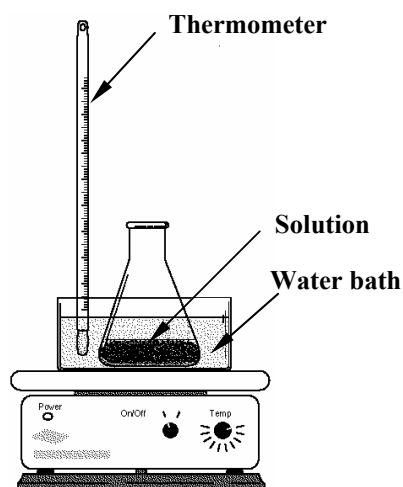
What? _____

(7 × 6 + 1 × 10)

Question 5

(39)

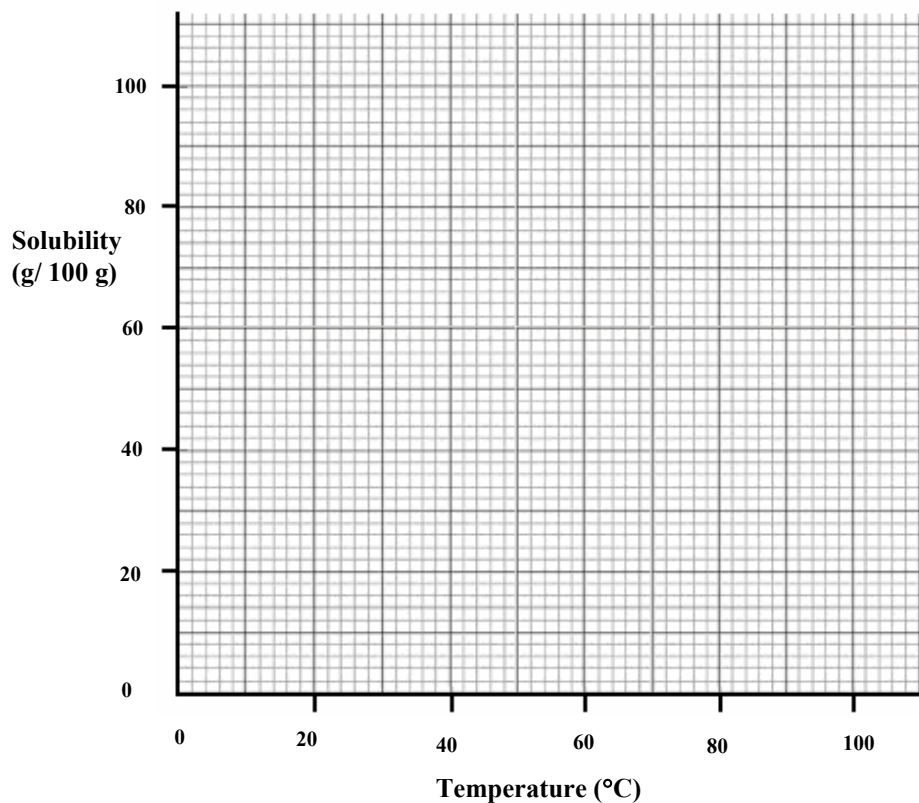
- (a) A pupil used the apparatus shown in the diagram to quantitatively investigate the effect of temperature on the solubility of copper sulfate crystals in water. 100 g of water in the conical flask was brought to the required temperature using the water bath. Copper sulfate crystals were added to the water until no more would dissolve. The mass of the copper sulfate crystals that dissolved was noted.



The data was recorded and is given the table.

Temperature (°C)	0	20	40	60	80	100
Mass of copper sulfate crystals dissolved (g/ 100 g)	14	21	29	40	55	75

- (i) Draw a **graph** of mass of copper sulfate crystals dissolved (solubility) against temperature in the grid below. A **smooth curve** through the plotted points is required. (9)



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(1) (2)

- (ii) Use your graph to *estimate the solubility* of copper sulfate crystals at 10 °C. (3)

- (iii) Describe, using an appropriate labelled diagram in the box provided, how to *grow and collect crystals* of copper sulfate from the solution produced at 100 °C. (12)

- (b) (i) What is the *pH scale*? How can *pH be measured*? (9)

What? _____

How? _____

- (ii) Look at the table and name a *strong acid* and a *weak alkali* from it. (6)

Substance	Pure water	Household ammonia	Urine	Gastric juice (stomach)	Blood
Ph	7	12	6	1.4	7.4

Strong acid _____

Weak alkali _____

Question 6

(39)

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(a) The diagram shows an apparatus used to decompose water by passing an electric current through it. The volumes of gases released by this process can be measured as shown.

(i) Name the **process** which decomposes a substance when electric current is passed through it. (3)

Name _____

(ii) Why is a small amount of **sulfuric acid** added to the water? (3)

Why? _____

(iii) Name **gas A** and give a **test** to confirm your answer. (6)

Name _____

Test for gas **A** _____

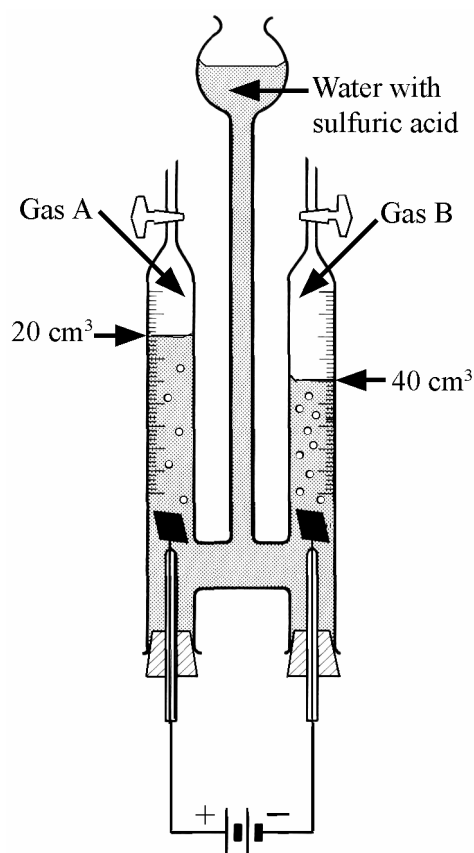
(iv) Name **gas B** and give a **test** to confirm your answer. (6)

Name _____

Test for gas **B** _____

(v) Water is a compound formed by the chemical combination of elements **A** and **B**. In what **proportion** do **A** and **B** combine to form water? (3)

What? _____



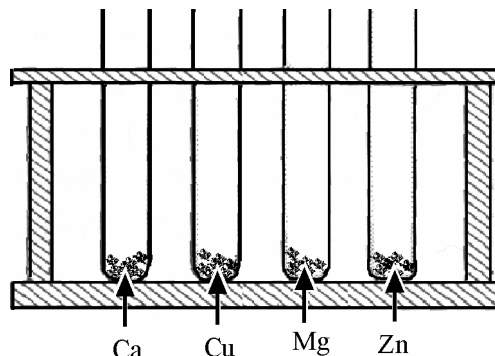
(1) (2)

- (b) A investigation was carried out to see how different metals react with water and dilute acid. The diagram shows the metals used in this investigation. When a metal reacts with water or a dilute acid it produces a gas. The water in this experiment was added to the metal at room temperature.

(1) (2)

- (i) Name the **gas** produced by the reaction of a metal used in this experiment with water or a dilute acid. (3)

Name _____



- (ii) Name a **dilute acid suitable** for use in this experiment. (3)

Name _____

- (iii) Name a **metal**, used in this experiment that **reacts with water** at room temperature. (3)

Name _____

- (iv) Name a **metal**, used in this experiment that **does not react** with the **dilute acid** that you have named above. (3)

Name _____

- (v) List the **metals** used in this experiment in **decreasing order of reactivity with the dilute acid** named (most reactive first). (3)

List _____

- (vi) Give **one safety precaution** that you would take when performing this experiment. (3)

Give _____
