

Name Class Date

- 1** An element has a melting point of 39°C . Give the state the element would be in if the temperature today is 23°C .

..... (1 mark)

- 2 a** A bottle of perfume will diffuse into the room if it is left open. Circle the temperature of the room that would make this happen fastest.

-10°C **10°C** **18°C** **25°C**

(1 mark)

- b** Explain why you chose this temperature.

..... (1 mark)

- 3** Beth placed a bottle of air into a freezer. Several days later she checked the bottle and it had collapsed. Explain why this happened.

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

..... (4 marks)

- 4** Copper sulfate forms crystals and has the symbol CuSO_4 . Explain how you know from this formula whether copper sulfate is an element or a compound.

..... (1 mark)

Name Class Date

5 Nitric acid has the formula HNO_3 .

How many of each type of atom would be in one molecule of nitric acid?

..... hydrogen atoms

..... nitrogen atoms

..... oxygen atoms

(1 mark)

6 For each process in the table below, identify whether it is a chemical change or a physical change.

	Chemical change	Physical change
burning a candle		
melting ice		
dissolving sugar in water		
cooking an egg		

(2 marks)

7 Butane is a fuel. Complete the following word equation to show the products that form when butane is burnt.

butane + oxygen \rightarrow +

(1 mark)

8 Megan placed 6.8 g hydrogen peroxide in a beaker. It decomposed to form water and oxygen. Megan found out that 3.6 g of water was left in the beaker. Calculate the amount of oxygen that formed. Show your working out.

..... g

(2 marks)

Name Class Date

- 9 a** The reaction between magnesium and hydrochloric acid is exothermic. What would happen to the temperature during the reaction between magnesium and hydrochloric acid?

..... (1 mark)

- b** Name the salt that forms when magnesium reacts with hydrochloric acid.

..... (1 mark)

- 10** Matias carries out an investigation to compare the solubility of three different salts in water. His method is shown below. Explain why Matias' investigation may not give him valid results.

Add one spatula full of salt X to a test tube containing water. Shake it until it dissolves. Keep adding salt X until no more will dissolve. Record how many spatulas you added. Repeat the experiment using salt Y, then salt Z. The salt that is most soluble will be the one that has the most spatulas added to the water.

.....
..... (2 marks)

- 11** Give one difference that could be used to distinguish a sedimentary rock sample from an igneous rock sample.

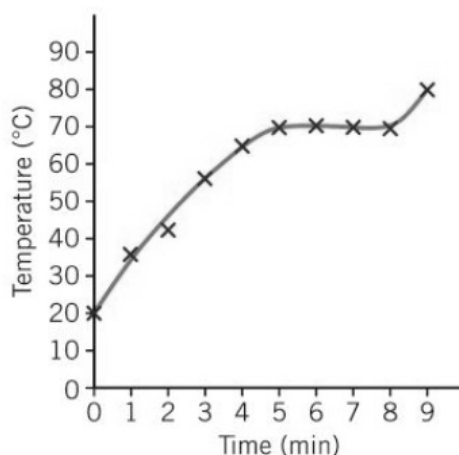
..... (1 mark)

- 12** Explain why a liquid takes the shape of its container but a solid does not.

.....
.....
..... (3 marks)

Name Class Date

- 13** The graph below shows the temperature of stearic acid as it is heated. Use the graph to identify the melting point of stearic acid.



Melting point of stearic acid = °C

(1 mark)

- 14** Explain why it is important to check the pressure of car tyres whilst they are **cold**.

.....

..... (2 marks)

- 15** Nitrogen dioxide has the formula NO_2 . How many oxygen atoms are present for each nitrogen atom in a molecule of nitrogen dioxide?

..... (1 mark)

- 16** Margarine can be produced using a process called hydrogenation. A word equation for hydrogenation is shown below.

unsaturated fat + hydrogen + nickel \rightarrow saturated fat + nickel

- a** Name the substance acting as a catalyst during hydrogenation.

.....

(1 mark)

Name Class Date

b Explain how you identified the catalyst, and how a catalyst is normally represented/written in an equation?

.....

..... (1 mark)

17 a Iron reacts with oxygen and water to form iron oxide, more commonly known as rust. Give the name used to describe reactions between substances and oxygen that form an oxide.

.....

(1 mark)

b A boat manufacturer tests three different types of iron boat hulls to see which one starts to rust first. Give two reasons why he should not use a line graph to display his results.

.....

..... (2 marks)

18 Sammi dissolves 1 g of solid citric acid in 100 cm³ water to form a solution of the acid (solution A). She makes another solution of the acid by dissolving 5.5 g of solid hydrogen chloride in 300 cm³ water (solution B). Calculate which acid solution is the most dilute. Show all your working out.

.....

(3 marks)

19 The table below shows the sizes of the atoms across Period 2 of the Periodic table.

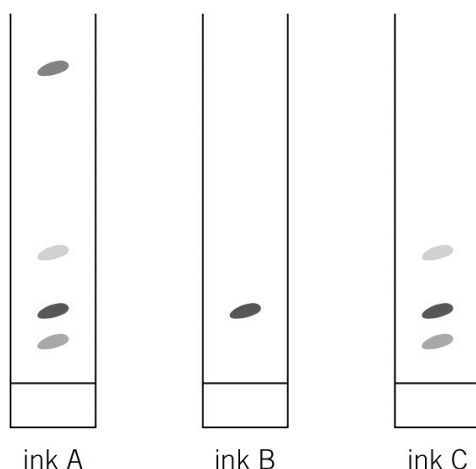
Name Class Date

The atom size for carbon is missing. Use the data available to predict the atom size for carbon. Write your answer in the table.

Period 2	
Element	Atomic radius (nm)
lithium	0.123
beryllium	0.089
boron	0.082
carbon	_____
nitrogen	0.065
oxygen	0.066
fluorine	0.064

(1 mark)

20 Three different inks were tested using chromatography. Use the chromatograms to identify which ink was **not** a mixture.



Ink

(1 mark)

21 Compare what happens when water boils to when it evaporates.

.....

.....

..... (3 marks)

Name Class Date

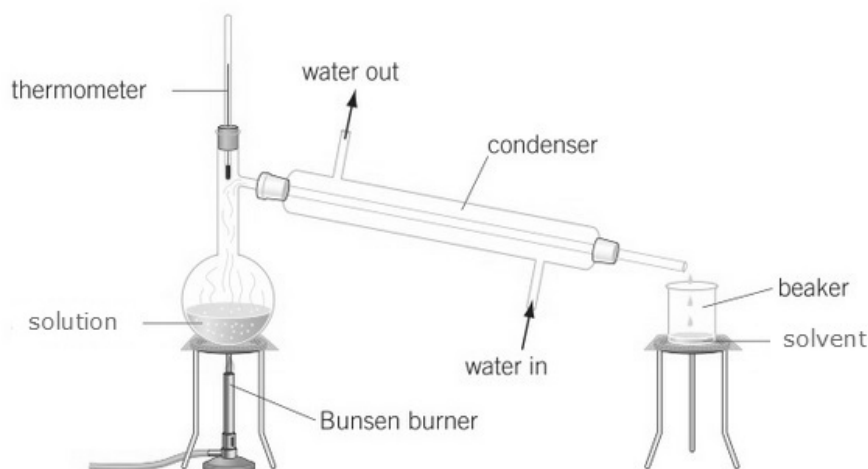
22 Iron reacts with oxygen to form iron oxides. One oxide of iron has the formula FeO.

The mass of an iron atom is 56 and the mass of an oxygen atom is 16. Use this information to calculate the percentage of the total mass that comes from oxygen. Show your working out.

..... %

(3 marks)

23 Distillation can be used to separate a solvent from a solution. For example, distillation can be used to separate pure water from salt water. The apparatus is shown below.



a Suggest why it is important to check the thermometer when using distillation to obtain pure water for drinking.

..... (1 mark)

b Explain why it is important that cold water from a tap is continually flowing through the condenser.

.....

..... (1 mark)

Name Class Date

- 24** The reaction between metals and acids is exothermic. The more reactive the metal is, the more exothermic its reaction with acid.
Suggest a practical method you could use to confirm whether more reactive metals react more exothermically with hydrochloric acid.

.....
.....
..... (3 marks)

- 25** The equations below represent possible reactions between Group 7 elements and compounds of other Group 7 elements.

- A** bromine + potassium chloride → potassium bromide + chlorine
B chlorine + potassium bromide → potassium chloride + bromine
C iodine + potassium chloride → potassium iodide + chlorine

- a** Give the letter for the equation of the reaction that will take place.

..... (1 mark)

- b** Name the type of reaction that has taken place.

.....
(1 mark)

Name Class Date

26 Jack is a farmer wants to grow two different crops on his farm. The table below shows the soil pH range over which each crop grow best. The soil on his farm has a neutral pH.

Crop	Best pH range for growth
X	5-6
Y	8-10

Explain what Jack has to do in order to make sure that each crop grows best in his soil.

In this question you get marks for how well your answer is written. You will get marks for:

- spelling
- grammar
- organising your ideas and information clearly
- using scientific key words

.....

.....

.....

.....

.....

..... (6 marks)

Name Class Date

- 27** Group 0 elements are called the noble gases. Information about the noble gases is shown below.

Element	Boiling point(°C)	Relative atomic mass
helium	-269	4
neon	-246	20
argon	-186	40
krypton	-152	84
xenon	-108	131

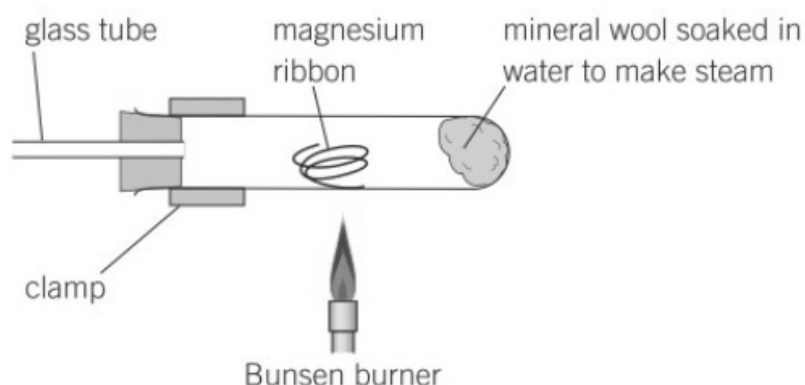
- a** Predict which noble gas would diffuse most quickly through air.

..... (1 mark)

- b** Explain your prediction.

.....
..... (1 mark)

- 28** Sarah set up the following apparatus and used it to react magnesium with water (H_2O) in the form of steam to form magnesium oxide (MgO) and a gas.



- a** Write a balanced equation to show the reaction when magnesium (Mg) reacts with steam (H_2O).

Name Class Date

.....

..... (2 marks)

b The results of Sarah's reaction are shown below.

Mass of magnesium ribbon	2.4 g
Mass of mineral wool + water before reaction	5.3 g
Mass of mineral wool + water after reaction	3.5 g
Mass of magnesium oxide formed	4 g

Calculate the mass of water that reacted with the magnesium ribbon to form magnesium oxide.

..... (1 mark)

c Conservation of mass states that the total mass of reactants is equal to the total mass of products. In Sarah's experiment, you can assume that all the magnesium fully reacted with the water used. Show all workings to any calculations you carry out.

Use Sarah's results to calculate:

i the total mass of products formed by the reaction

.....

..... (2 marks)

ii the mass of the gas formed by the reaction.

.....

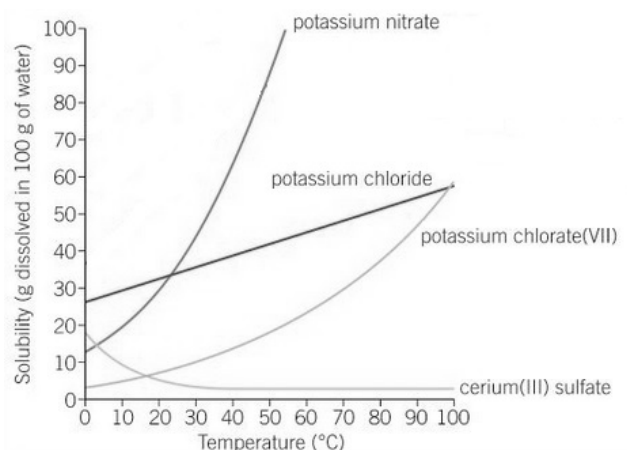
..... (2 marks)

Name Class Date

29 Explain how deforestation contributes to global warming.

.....
 (2 marks)

30 Different substances have different solubility. The graph below shows the solubility of some substances in water.



Use the graph to answer the following questions.

a Which substance has the lowest solubility at 20°C?

..... (1 mark)

b Which substance has the biggest range of solubility between 0°C and 50°C?

..... (1 mark)

c A solution of potassium chloride was made by dissolving 58 g of potassium chloride in boiling water. Describe what observations you would make about the solution as it was left to cool down.

.....
 (2 marks)