Kinetic Molecular of Matter – 2020 IGCSE 0625

1. March/2020/Paper_12/No.14

The molecules of a substance in a particular state of matter move freely with random motion. The average speed of the molecules is increasing.

What is being described?

A a gas being heated

B a liquid evaporating

C a solid being heated

D a solid melting

2. March/2020/Paper_12/No.15

A student measures the mass of warm water in an open container over two minutes. The container is kept at a constant temperature. The results are in the table.

time / minutes	mass / g
0.0	33.9
0.5	30.6
1.0	27.6
1.5	24.9
2.0	22.5

Why does the mass of the water change?

A The water evaporates.

B The water freezes.

C The water condenses.

D The water boils.

3. March/2020/Paper_22/No.16

When pollen grains in water are viewed through a microscope, they are seen to be in continuous, rapid random motion.

What causes a pollen grain to move in this way?

A convection currents in the water

B bombardment by a single molecule of water

C uneven bombardment on different sides by water molecules

D collision with another pollen grain due to their kinetic energies

4. March/2020/Paper_22/No.17

A student measures the mass of warm water in an open container over two minutes. The container is kept at a constant temperature. The results are in the table.

time / minutes	mass / g
0.0	33.9
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Why does the mass of the water change?

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B The water freezes.

C The water condenses.

D The water boils.

5. March/2020/Paper_32/No.6

(a) Table 6.1 gives a list of statements about molecules in gases and solids.

Table 6.1

statement	gas	solid
molecules are closely packed		
molecules are free to move around from place to place		
molecules are far apart compared to their size		
molecules can only vibrate about a fixed position		
molecules change position randomly		

Put **one** tick in every row to indicate whether each statement refers to a gas or a solid.

[4]

(b) Fig. 6.1 represents a smoke particle in air. The smoke particle is moving.

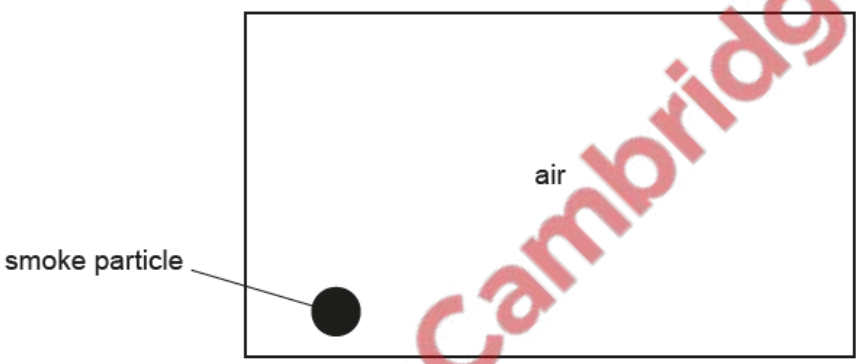

Fig. 6.1

Fig. 6.2 shows the path of the smoke particle and the position of the smoke particle a short time later.

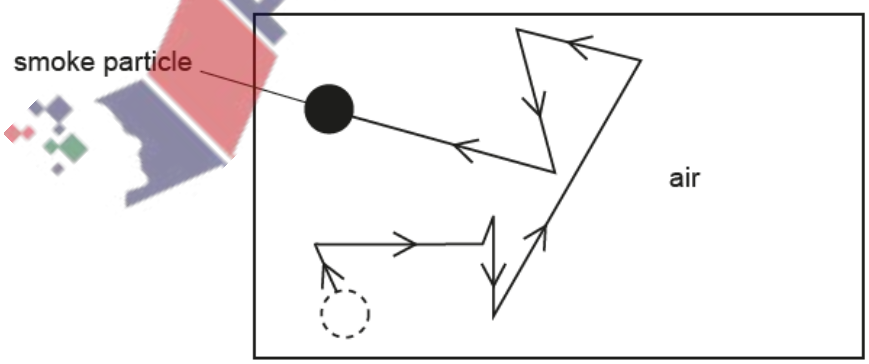

Fig. 6.2

(i) State the term given to the movement of the smoke particle.

..... [1]

(ii) State what the motion of the smoke particle shows about air molecules.

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..... [3]

[Total: 8]

6. June/2020/Paper_11/No.14

A gas is heated in a sealed container.

The volume of the container does not change.

What happens to the molecules of the gas?

A The average distance between molecules increases.

B The average kinetic energy of the molecules increases.

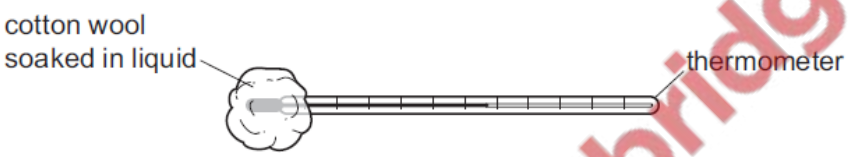
C The mass of each molecule increases.

D The volume of each molecule increases.

7. June/2020/Paper_11/No.15

A student is investigating evaporation. She soaks a piece of cotton wool in a liquid and attaches this to the bulb of a thermometer.

As the liquid evaporates the temperature reading on the thermometer changes.



Which statement is correct?

A The more energetic molecules leave the liquid and the temperature reading decreases.

B The more energetic molecules leave the liquid and the temperature reading increases.

C The less energetic molecules leave the liquid and the temperature reading decreases.

D The less energetic molecules leave the liquid and the temperature reading increases.

8. June/2020/Paper_12/No.14

Evaporation occurs from the surface of a pool of water.

Which statement describes this change of state?

A Electrons move from the liquid and become a gas.

B Molecules that move from the liquid have the same energy as those that stay in the liquid.

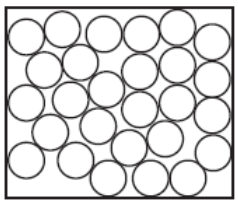
C The more energetic molecules escape the liquid.

D The more energetic molecules remain in the liquid.

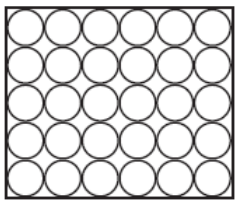
9. June/2020/Paper_13/No.14

What is the correct particle diagram for a solid?

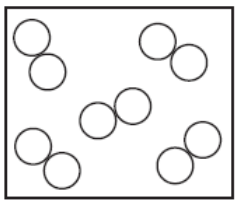
A



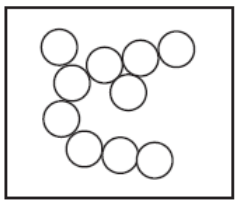
B



C



D



10. June/2020/Paper_13/No.15

A sealed box contains a fixed mass of gas.

Which action results in each molecule of the gas colliding with the walls of the container less frequently and with a smaller force?

A Decrease the temperature of the gas.

B Decrease the volume of the container.

C Increase the temperature of the gas.

D Increase the volume of the container.

11. June/2020/Paper_21/No.14

A gas is heated in a sealed container.

The volume of the container does not change.

What happens to the molecules of the gas?

A The average distance between molecules increases.

B The average kinetic energy of the molecules increases.

C The mass of each molecule increases.

D The volume of each molecule increases.

12. June/2020/Paper_21/No.15

Water in a beaker evaporates when left on a bench for a period of time.

Which three factors all affect the rate of evaporation of the water?

A wind speed, surface area, temperature

B wind speed, temperature, volume

C wind speed, surface area, volume

D surface area, temperature, volume

13. June/2020/Paper_22/No.14

Which row describes the forces between the molecules and the motion of the molecules in a solid?

	forces between molecules	motion of molecules
A	strong	move freely
B	strong	vibrate only
C	weak	move freely
D	weak	vibrate only

14. June/2020/Paper_22/No.15

Wet clothes are hanging outside to dry.

Which condition decreases the rate of evaporation of the water from the clothes?

A folded clothes

B higher temperature

C wetter clothes

D windy day

15. June/2020/Paper_23/No.15

The relationship between pressure p and volume V of a gas is given as pV = constant.

Under which conditions for the mass of a gas and for its temperature does the equation hold?

	mass	temperature
A	changing	changing
B	changing	constant
C	constant	changing
D	constant	constant

16. June/2020/Paper_31/No.3

Some gas molecules are in a box at room temperature.
Fig. 3.1 shows the position of some of the molecules and the direction of movement of each molecule.

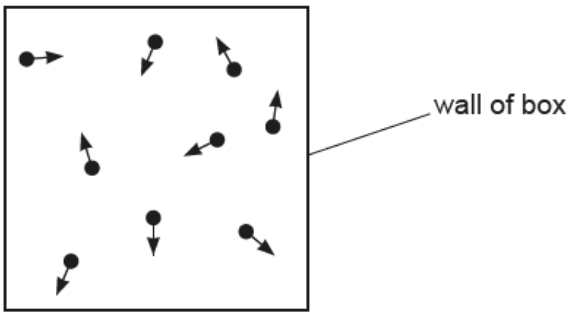


Fig. 3.1

(a) **(i)** Describe the movement of the gas molecules.

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..... [2]

(ii) Describe how the molecules exert a pressure on the walls of the box.

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..... [2]

(b) The gas in Fig. 3.1 is cooled. The gas turns into a liquid then into a solid.

State how the average separation of molecules in the gas is different from the average separation of molecules in the solid.

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..... [1]

[Total: 5]

17. June/2020/Paper_32/No.4

(a) Match each description with the correct state of matter in Table 4.1.

Write the correct letter in Table 4.1.

A – Molecules move around freely and are far apart from each other.

B – Molecules vibrate about fixed positions.

C – Molecules move around randomly and are close to each other.

Table 4.1

state of matter	description
solids	
liquids	
gases	

[2]

(b) Some students heat water in a beaker. They measure the temperature every minute. They heat the water for 8 minutes until it boils, and then continue to heat it for a further 5 minutes.

Describe and explain how the temperature of the water changes during the 13 minutes.

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..... [3]

[Total: 5]

18. June/2020/Paper_43/No.4

(a) Describe, in terms of molecules, what happens when a liquid evaporates.

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..... [4]

(b) Fig. 4.1 shows wet clothes drying on a washing line in an outside area.

Fig. 4.1

State **two** changes in the weather that help the wet clothes to dry more quickly.

1. .....

2. .....

[2]

[Total: 6]