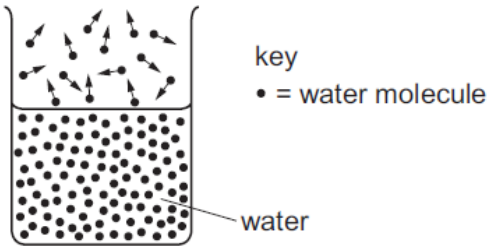
Kinetic Molecular of Matter – 2020 IGCSE 0625

1. Nov/2020/Paper_11/No.15

The diagram shows the more energetic water molecules escaping from the surface of liquid water.



What is this process called?

A Brownian motion

B condensation

C evaporation

D conduction

2. Nov/2020/Paper_13/No.15

A textbook gives the description of a thermal process as 'more-energetic molecules escape from the surface of a liquid which causes the liquid to cool'.

Which process is being described?

A boiling

B Brownian motion

C condensation

D evaporation

3. Nov/2020/Paper_23/No.16

Equal volumes of solids and liquids experience different changes of volume when they are heated through the same temperature range.

What is the reason for this?

A The average increase in separation of the particles in a liquid is greater than the average increase in separation of those in a solid.

B The average increase in separation of the particles in a liquid is less than the average increase in separation of those in a solid.

C The particles in liquids expand by less than those in solids.

D The particles in liquids expand by more than those in solids.

4. Nov/2020/Paper_31/No.5(b)

(b) The temperature of the gas inside the steel container decreases.

State and explain how the pressure of the gas changes as the temperature of the gas decreases.

Use your ideas about molecules in your answer.

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.....

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.....

.....

..... [3]

5. Nov/2020/Paper_31/No.6(a)

(a) Fig. 6.1 represents three changes of state. Each pair of diagrams A, B and C shows the arrangement of molecules in a substance before and after it changes state.

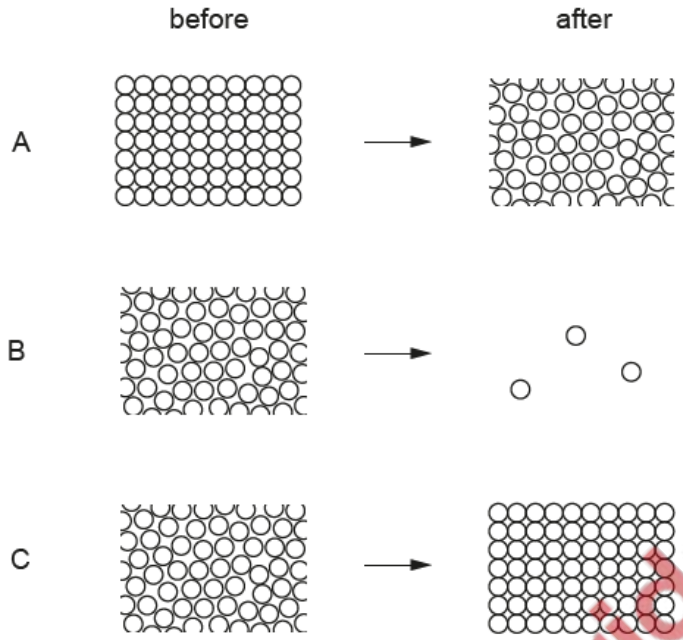

Fig. 6.1

Give the term used for each change of state.

A .....

B .....

C .....

[3]

6. Nov/2020/Paper_32/No.4

A rigid container is filled with a gas.

(a) Describe the movement and arrangement of the gas molecules in the container.

.....

.....

..... [3]

(b) The gas in the container is heated. The volume of the gas does **not** change.

State and explain the change in pressure of the gas as the temperature of the gas increases. Use your ideas about molecules in your answer.

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.....

.....

..... [3]

[Total: 6]

7. Nov/2020/Paper_33/No.5

(a) Fig. 5.1 shows diagrams of the arrangement of molecules in three states of matter and shows descriptions of how the molecules move.

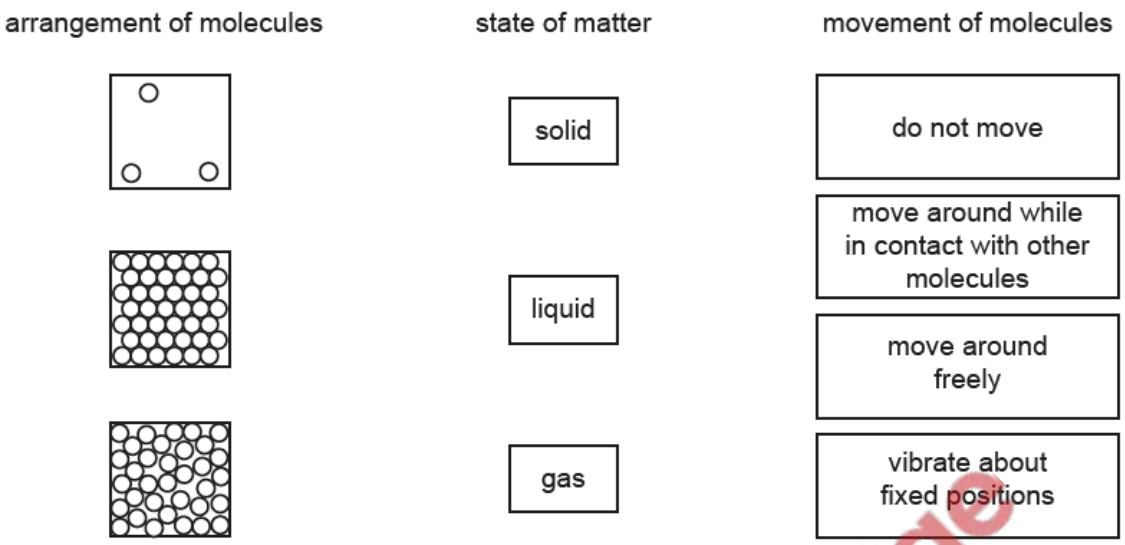

Fig. 5.1

On Fig. 5.1, draw a line:

- from each arrangement of molecules to the correct state of matter
- from the state of matter to the correct description of the movement of molecules.

[4]

(b) A bicycle tyre contains air. The tyre is sealed and does not leak.

The temperature of the air in the tyre increases by 20 °C. The volume of the tyre does **not** change.

(i) State how the increase in temperature affects the motion of the air molecules in the tyre.

..... [1]

(ii) State how the increase in temperature changes the pressure of the air in the tyre.

..... [1]

(c) Fig. 5.2 shows a liquid-in-glass thermometer.

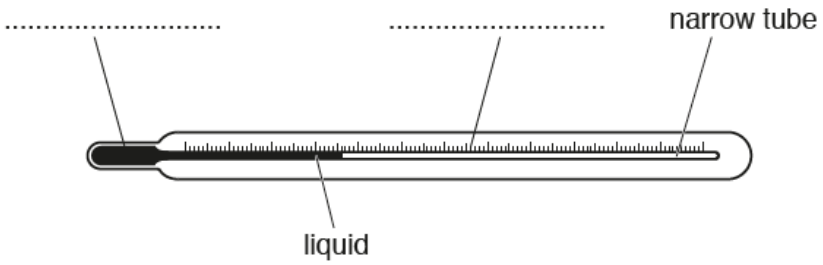

Fig. 5.2

(i) Add the missing labels to Fig. 5.2. [2]

(ii) The thermometer in Fig. 5.2 is designed to measure a range of temperatures from 0 °C to 100 °C.

State the name of a suitable liquid for use in this thermometer.

..... [1]

(iii) Describe and explain the changes in the thermometer in Fig. 5.2 when the temperature of the liquid increases.

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..... [2]

[Total: 11]

8. Nov/2020/Paper_41/No.4

A large test-tube contains a liquid at room temperature. An electric heater is immersed in the liquid and is switched on. Thermal energy is supplied to the liquid by the heater. The temperature of the liquid increases until it reaches its boiling point. The liquid then starts to change into gas.

(a) Describe, in terms of molecules and their motion, how a liquid differs from a gas.

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.....

..... [3]

(b) Describe what happens to molecules of the liquid as its temperature begins to increase.

.....

.....

..... [2]

(c) **(i)** Explain, in terms of molecules, why a supply of thermal energy is needed to change the liquid into a gas.

.....

..... [1]

(ii) The density of the liquid in the test-tube is $0.86\,g/cm^3$. The volume of liquid in the test-tube is $50\,cm^3$.

The liquid reaches its boiling point. It now absorbs 18 000 J of thermal energy and all of the liquid changes into a gas.

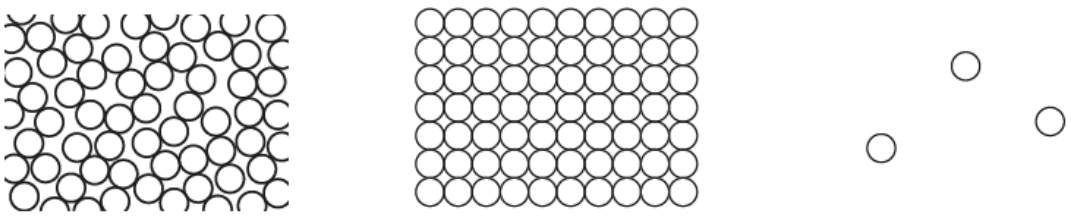
Calculate the specific latent heat of vaporisation of this liquid.

specific latent heat = ... [3]

[Total: 9]

9. Nov/2020/Paper_43/No.4

In Fig. 4.1, the circles represent molecules in different states of matter.



A B C

Fig. 4.1

(a) Identify the states **A**, **B** and **C**.

A .....

B .....

C .....

[2]

(b) Explain, in terms of forces between molecules, why gases expand more than liquids when they have the same rise in temperature. Assume that the pressure remains constant.

.....

.....

..... [2]

(c) Fig. 4.2 shows a cylinder and piston.

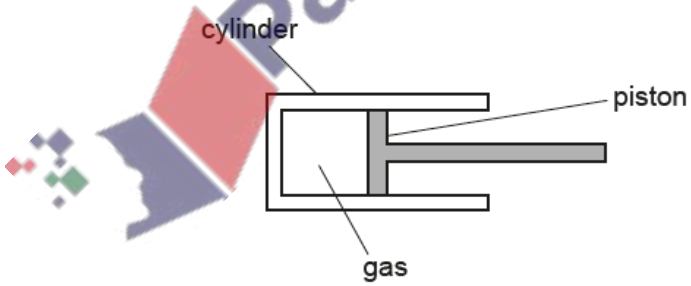


Fig. 4.2

The volume of gas in the cylinder is 3400 cm^3. The pressure of the gas in the cylinder is 0.90×10^5 Pa.

(i) The piston is moved to the left and fixed in a new position. The pressure of the gas in the cylinder increases to 2.5×10^5 Pa. Assume that the temperature of the gas does not change.

Calculate the new volume of the gas.

volume = ... [3]

(ii) The gas in the cylinder is now heated. The piston remains fixed in the same position as in **(c)(i)**.

State and explain, in terms of molecules, any change in the pressure of the gas.

statement .....

explanation .....

.....

[3]

[Total: 10]