

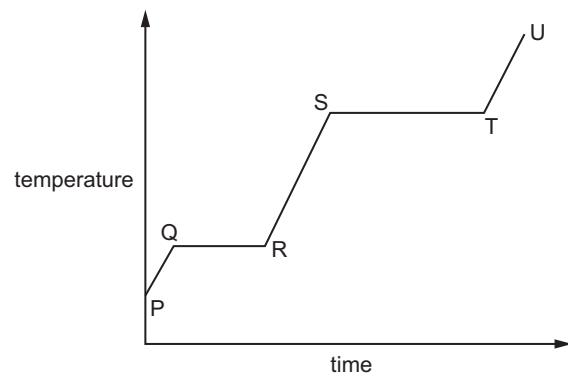
- 1 A sealed balloon contains air.

The temperature of the balloon is increased.

Which row describes how the pressure in the balloon and the kinetic energy of the particles in air change?

	pressure	kinetic energy of particles
A	decreases	decreases
B	increases	decreases
C	decreases	increases
D	increases	increases

- 2 The diagram shows the heating curve for a substance.



Between which two points do the particles of the substance change from being in fixed positions to being mobile?

- A** P and Q **B** Q and R **C** S and T **D** T and U

- 1 What happens to the volume of a fixed mass of gas when pressure and temperature are separately increased?

	volume of gas	
	pressure increased	temperature increased
A	increases	increases
B	no change	decreases
C	decreases	increases
D	no change	increases

1 The three states of matter are solid, liquid and gas.

- (a) Complete Table 1.1 to describe the structures of solids, liquids and gases in terms of particle separation, particle arrangement and particle motion.

Table 1.1

state of matter	particle separation	particle arrangement	particle motion
solid	touching		
liquid			
gas		random	random

[3]

- (b) Substances can physically change.

Name each physical change:

- solid to liquid
- gas to liquid
- solid to aqueous.

[3]

- (c) Gases diffuse.

- (i) Describe, in terms of particles, why gases diffuse.

..... [1]

- (ii) State what determines the relative rate of diffusion of gases at constant temperature.

..... [1]

- (d) Gaseous oxides of nitrogen are atmospheric pollutants. One adverse effect of oxides of nitrogen is the formation of acid rain.

State **two other** adverse effects of oxides of nitrogen.

1.....

2.....

[2]

- (e) In a catalytic converter, oxides of nitrogen are removed by reaction with the toxic gaseous product of the incomplete combustion of hydrocarbon fuels. Two non-toxic gases are formed in this reaction.

- (i) Name the toxic gaseous product of the incomplete combustion of hydrocarbon fuels.

..... [1]

- (ii) Name the **two** non-toxic gases formed in the catalytic converter.

1

2

[2]

[Total: 13]

- 1 A gas is placed in a sealed container with a fixed volume.

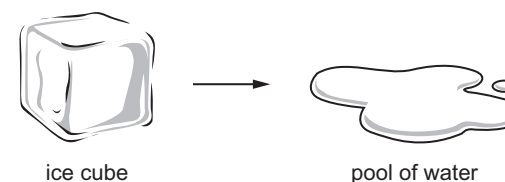
The gas is heated.

Which statements are correct?

- 1 The gas molecules move around faster.
- 2 The gas particles collide with the walls of the container more frequently.
- 3 The pressure in the container decreases.

A 1 and 2 **B** 1 only **C** 2 and 3 **D** 2 only

- 1 An ice cube melts.

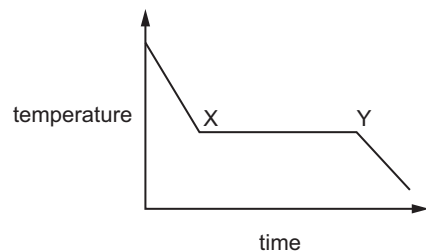


What happens to the molecules of water in the ice cube?

- A** They evaporate.
- B** They dissolve.
- C** They gain energy.
- D** They lose energy.

2 Solid G is heated until it melts. It is then left to cool to room temperature.

The graph shows the cooling curve for G.



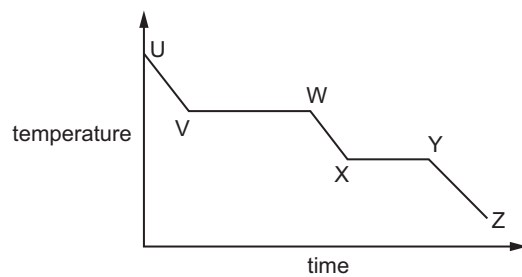
Four statements about the cooling curve between X and Y are listed.

- 1 The speed of the molecules of G decreases.
- 2 The molecules of G become less closely packed.
- 3 Thermal energy is released by the molecules of G to the surroundings.
- 4 G changes from solid to liquid.

Which statements are correct?

- A** 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

2 A cooling curve for a substance is shown.



Which statement is correct?

- A** Between U and V, the substance is condensing.
- B** Between V and W, heat is being absorbed from the surroundings.
- C** Between W and X, the particles are close together and randomly arranged.
- D** Between Y and Z, the substance is changing from a liquid to a solid.