IGCSE · Cambridge (CIE) · Chemistry

15 mins 15 questions

Multiple Choice Questions

Solids, liquids & gases

Kinetic Theory / States of Matter / Pressure & Temperature in Gases / Diffusion

Easy (5 questions)	/5
Medium (5 questions)	/5
Hard (5 questions)	/5
Total Marks	**/15**

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Easy Questions

1 Many chemical processes involve substances in either the liquid or the gaseous state.

Which of the following statements is correct?

A. A specific mass of a gas has a fixed volume at room temperature

B. A specific mass of a liquid has a fixed volume at room temperature

C. 25 cm^3 of gas contains more particles than 25 cm^3 of liquid

D. Liquid particles placed inside a sealed container have fixed positions

(1 mark)

2 Four substances are shown below.

In which of these substances are the particles close together and moving slowly past each other?

A. Ice

B. Air

C. Steam

D. Water

(1 mark)

3 A student noted the following observation in his laboratory notebook:

"The particles moved slowly from an area of high concentration to an area of low concentration."

Which process is being described?

A. Diffusion of substance in a liquid.

B. The particles of a solid during melting.

C. A liquid being frozen.

D. Diffusion of a substance through air.

(1 mark)

4 Extended Only

A small amount of bleach was accidentally spilled on a kitchen floor. After a while it was observed that the floor appeared to be dry and the whole kitchen smelled of bleach.

Which processes have occurred?

A. Evaporation and diffusion

B. Distillation and diffusion

C. Evaporation only

D. Diffusion only

(1 mark)

5 Which words complete the gaps 1 & 2 in these sentences?

As the temperature of air in a balloon .....1..... the volume increases. When the volume of air in a balloon increases the pressure .....2.....

	1	2
A	increases	increases
B	increases	decreases
C	decreases	increases
D	decreases	decreases

(1 mark)

Medium Questions

1 The following four statements describe the arrangement of particles in a substance.

1	Particles are moving in all directions
2	Particles are arranged in neat rows
3	Particles can move past each other
4	Particles vibrate about their positions

Which of the four statements describe the arrangement of particles in a solid?

A. 1 and 2

B. 2 and 4

C. 1 and 3

D. 2 only

(1 mark)

2 The diagram shows a cup of hot chocolate which was prepared by mixing boiling water

with chocolate powder.

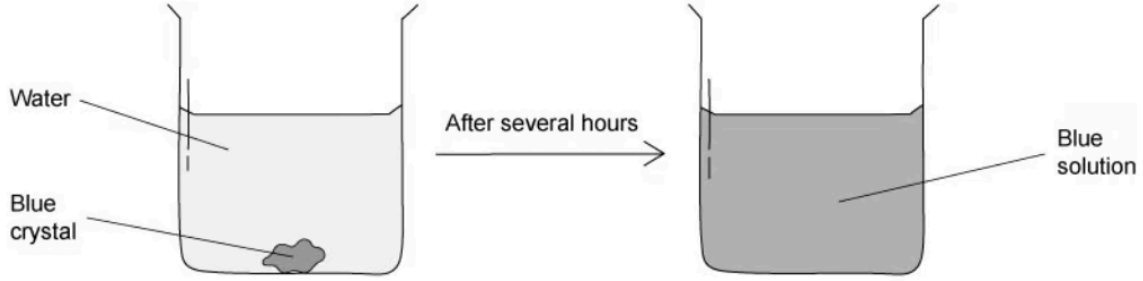
Which row correctly describes the particles of water in the air above the cup compared to those in the hot chocolate drink inside the cup?

	Particles move faster	Particles are closer together
A	✓	✓
B	✓	×
C	×	✓
D	×	×

(1 mark)

3 The diagram shows what happens when a blue soluble crystal is placed in a beaker of

water.

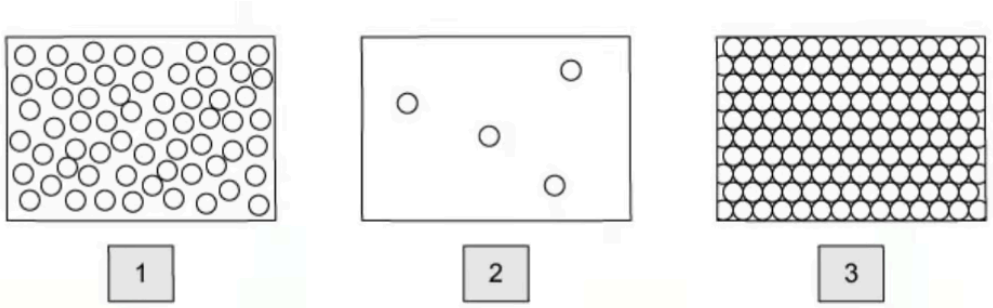


Which row correctly describes the processes taking place?

	Chemical process	Dissolving	Diffusion
A	✓	✓	✓
B	×	×	✓
C	✓	×	✓
D	×	✓	✓

(1 mark)

4 Substance X can occur in three different physical states as shown in the diagram.



Which statement is correct?

A. In state 1 the particles vibrate around fixed positions but don't move

B. Diffusion occurs in the phase change from state 1 to 2

C. The volume of the substance in state 3 is fixed

D. Condensation occurs in the phase change from state 3 to 2

(1 mark)

5 Matter exists in three states which are solid, liquid and gas. Phase changes occur when matter changes from one state to another.

In which changes do the particles move closer together?

$$\text{gas} \underset{3}{\overset{1}{\rightleftharpoons}} \text{liquid} \underset{4}{\overset{2}{\rightleftharpoons}} \text{solid}$$

A. 3 and 4

B. 1 and 3

C. 4 only

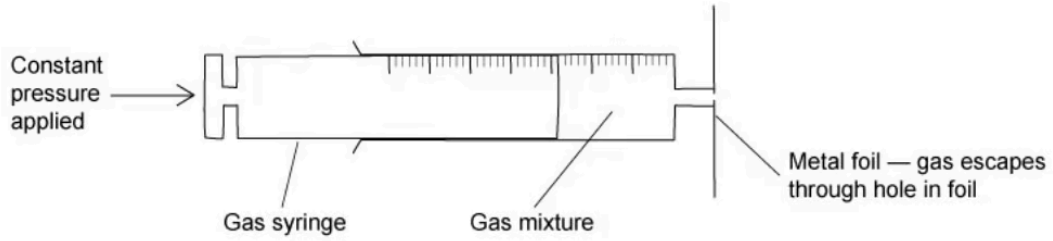
D. 1 and 2

(1 mark)

Hard Questions

1 Extended Only

The rate of diffusion of two gases, methane, CH_4, and propene, C_3H_6, is measured using the apparatus shown.



Which gas diffuses at a faster rate and why?

	Fastest gas	Reason
A	Propene	Propene molecules are heavier and so move faster.
B	Methane	Methane is a lighter molecule.
C	Propene	Propene is unsaturated so is more reactive.
D	Methane	Methane molecules are smaller so fit through the hole more easily.

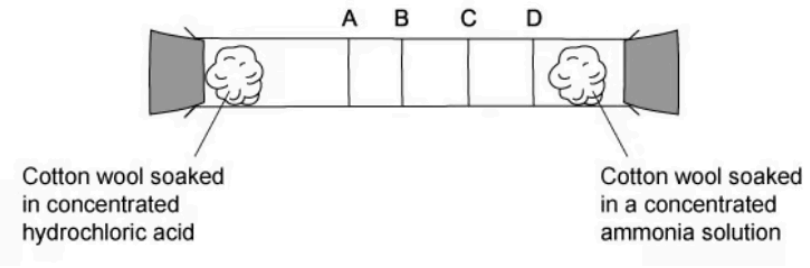
(1 mark)

2 Extended Only

Hydrogen chloride and ammonia are gases which are given off by cotton wool soaked in concentrated solutions and placed at either end of a glass tube as shown.

When the gases react together they produce ammonium chloride, a white solid.

Which line on the diagram correctly shows where the ammonium chloride is formed?



A. Line A

B. Line B

C. Line C

D. Line D

(1 mark)

3 The kinetic theory of matter explores the spatial relationship between the particles in solids, liquids and gases.

Which of the following processes causes the distance between particles to increase by the most?

A. Melting

B. Freezing

C. Vaporising

D. Condensation

(1 mark)

4 A student accidentally left a bottle of ammonia open in the corner of a laboratory. After a few minutes the entire laboratory smelled of ammonia.

Which process has occurred?

A. Dispersion

B. Diffusion

C. Evaporation

D. Distillation

(1 mark)

5 A student closed the lid tightly on an empty metal container which was used for paint. She heated the container over a Bunsen burner on a low flame for a few moments and observed the sides and top of the container bend outwards slightly.

She then turned off the burner and allowed the container to cool.

Which statement explains her observations?

A. The heat increased the pressure inside the container

B. The heat deformed the metal which then bent

C. The heat made the container reduce in size

D. More air particles entered the container

(1 mark)