KS3 SCIENCE · CHEMISTRY

Particles and states of matter: exam questions

Name _____
Total: 22 marks

1 Name the state of matter that has a fixed volume but takes the shape of its container. **[1 mark]**

2 The diagrams show the particles in three states of matter. Name the state shown in each diagram. **[3 marks]**



A B C

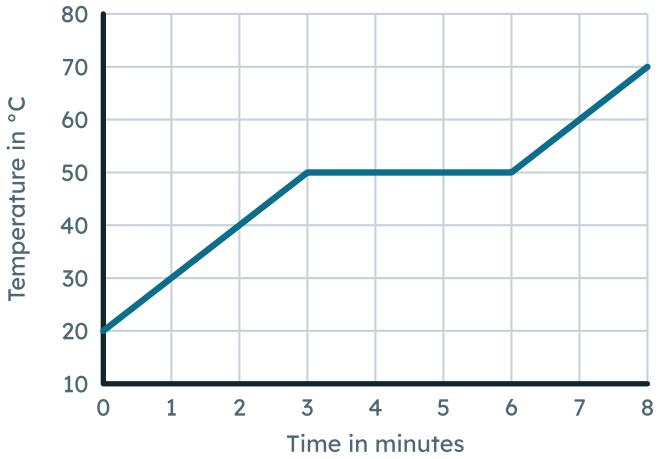
3 Describe the arrangement and the movement of the particles in a solid. **[2 marks]**

4 Explain why a gas is easy to squash into a smaller space but a solid is not. **[2 marks]**

5 Name the change of state when (a) a gas turns into a liquid, and (b) a solid turns straight into a gas. **[2 marks]**

6 A solid is heated until it melts. Explain what happens to its particles. **[3 marks]**

7 The graph shows the temperature of a pure solid as it is heated. (a) State the melting point of the solid. (b) Explain why the temperature stays the same between 3 and 6 minutes. **[3 marks]**



8 A sealed metal can of air is heated. Explain why the pressure inside the can rises. **[2 marks]**

9 Someone sprays air freshener in one corner of a room. A few minutes later it can be smelt all over the room. Explain why. **[2 marks]**

10 A metal block has a mass of 81 g and a volume of 30 cm^3. Calculate its density and give the unit. **[2 marks]**

Particles and states of matter: mark scheme

Total: 22 marks

1 [1 mark]

- Liquid **(1)**

2 [3 marks]

- A: gas **(1)**
- B: solid **(1)**
- C: liquid **(1)**

3 [2 marks]

- Arrangement: close together (touching) in a regular pattern **(1)**
- Movement: they vibrate about fixed positions **(1)**

4 [2 marks]

- In a gas there are big gaps (a lot of empty space) between the particles **(1)**
- In a solid the particles are already touching (accept: very close together), so they cannot be pushed closer **(1)**

5 [2 marks]

- (a) Condensing (accept: condensation) **(1)**
- (b) Subliming (accept: sublimation) **(1)**

6 [3 marks]

- They gain energy **(1)**
- They vibrate faster (accept: vibrate more) **(1)**
- They break away from their fixed positions and can slide past each other **(1)**

7 [3 marks]

- (a) 50 °C **(1)**
- (b) The solid is melting (accept: it is changing state) **(1)**
- (b) The energy is being used to break the particles away from their fixed positions, not to raise the temperature (accept: to overcome the forces between the particles) **(1)**

8 [2 marks]

- The particles gain energy and move faster **(1)**
- They hit the walls of the can harder and more often **(1)**

9 [2 marks]

- The air freshener particles move about at random and mix with the air particles **(1)**
- They spread out from where there are many to where there are few (accept: from a high concentration to a low concentration; this is diffusion) **(1)**

10 [2 marks]

- 2.7 (81 ÷ 30) **(1)**
- g/cm^3 (accept: grams per cubic centimetre) **(1)**