Chapter 7 Model of Matter – The Particulate Nature of Matter

AfL Quiz 1

Date: ……

By the end of this quiz, I should be able to:

- Describe the simple model of solids, liquids and gases, in terms of the arrangement and movement of the particles
- Draw a simplified model of the particles in the different states of matter

1 Which observation suggests that matter exist as very small, moving particles?

A Gold can be beaten into sheets.
B Solid will melt when heated.
C Some gases are less dense than air, but others are denser.
D The smell of scent soon fills a room when the bottle is opened. (D)

2 Which of the following is *true* about solids, liquids and gases?

A They have definite shapes.
B They can be compressed.
C They are made up of particles.
D They are made up of compounds. ( )

3 Which of these statements about a solid is ***incorrect?***

A The particles in a solid vibrate about fixed positions.
B There is very little space between the particles in a solid.
C The particles in a solid can move around freely.
D They are usually strong forces between the particles in a solid. ( )

4 In which of these substances are the particles moving the least?

A A sheet of iron B Carbon dioxide gas
C Cold air D Stagnant water ( )

5 Which one of the following is NOT made up of particles?

A Air B Bone
C Energy D Water ( )

6 In which of the following are the particles most disordered?

A Steam at 100 °C B Water at 100 °C
C Water at 0 °C D Ice at 0 °C ( )

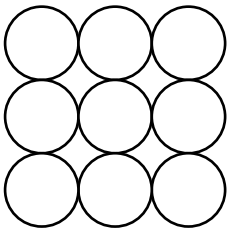
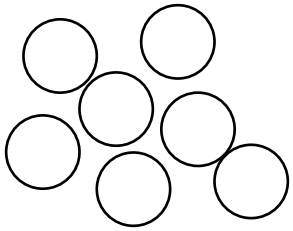
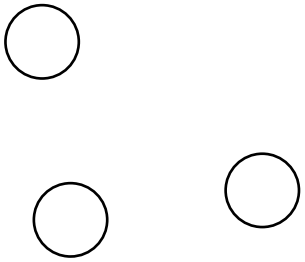
7 In the table below, substances with their melting point and boiling points are listed. Complete the table by classifying each substance as a solid, liquid or gas at room temperature of **25 °C.**

Substance	Melting point (°C)	Boiling point (°C)	State it exist as : solid / liquid / gas
Ammonia	− 77	− 34	**Gas**
Petrol	− 40	+62	**Liquid**
Paraffin wax	+ 55	+160	**Solid**
Methylated spirits	− 100	+80	**Liquid**
Table salt	+ 801	+1413	**Solid**
Carbon dioxide	−111	− 78	**Gas**
Copper (II) chloride	+ 620	+990	**Solid**
Methane	− 182	− 161	**Gas**
Hydrogen sulfide	− 85	− 60	**Gas**

8 Fill in the blanks in the table below.

Characteristics of particles	Solid	Liquid	Gas
Movement	**vibrates** about **fixed** position	**sliding past** each other	Move **randomly** in all **directions** at **high** speed
Arrangement	**orderly** and **closely** packed	**disorderly** and **closely** packed	**disorderly** and **far away from each other**

9 In the boxes provided, show the arrangement for each state.

		
Solid ***(draw 9 particles)***	**Liquid** ***(draw enough to show an irregular pattern)***	**Gas** ***(draw about 3-4 particles)***

Self-Evaluation: I am able to:	**Yes**	**No**
describe the movement and arrangement of the different states of matter		
draw a simplified model of the particles in the different states of matter		

Questions I still have:

_____

Chapter 7 Model of Matter – The Particulate Nature of Matter

AfL Quiz 2

Date: ……

By the end of this quiz, I should be able to:

- Explain melting and boiling in terms of the models of the three states of matter

1 Which of the following will *increase* when matter changes from the solid state to the liquid state?

I. Energy content of the particles
II. The distance between two particles
III. The speed of the particles
IV. The number of the particles in the matter.

A I and IV only.
B II and III only
C All except IV
D All of the above ( )

2 In an air-conditioned bus, water is collected on the glass window panes. This process is best described as _____.

A sublimation
B condensation
C evaporation
D melting ( )

3 What happens to the particles in a liquid after the liquid boils?

A The particles will stop moving randomly.
B The particles will vibrate.
C The particles break free from being held in their fixed positions.
D The particles move about freely and randomly in all directions. ( )

4 In which process can particles escape from the surface of a liquid at temperatures below its boiling point?

A boiling B condensation
C evaporation D sublimation ( )

5 When a gas is cooled, its particles _____.

A move closer together
B move more rapidly
C become smaller
D become stationary ( )

6 When ice melts, there are changes in the _____ of the water molecules.

A motion
B mass
C size
D number

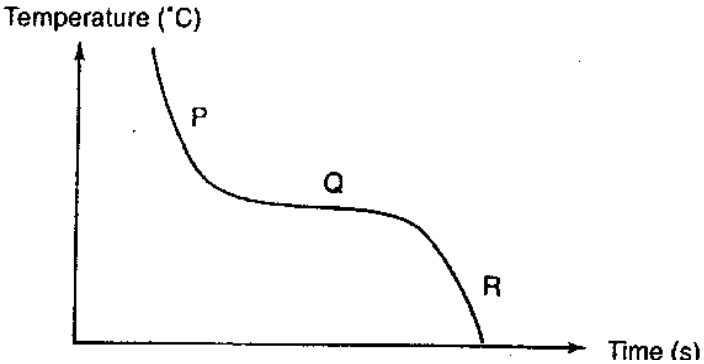
( )

7 In which process is heat energy given out?

A boiling
B sublimation
C freezing
D melting

( )

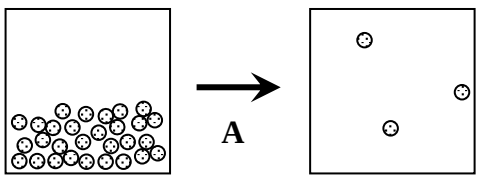
8 A sample of a pure compound was heated until it was completely molten and was then allowed to cool until it was completely solid again. Which of the following gives the correct states for a substance at P, Q and R?

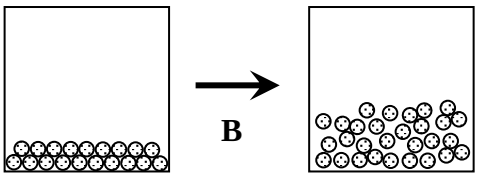


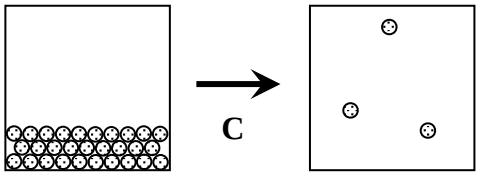
	P	Q	R
A	Gas	Gas and liquid	Liquid
B	Liquid	Liquid and solid	Solid
C	Gas	Liquid	Solid
D	Solid	Solid and Liquid	Liquid

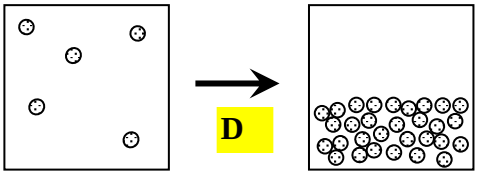
( )

9 The following shows diagrams of a process (**A**, **B**, **C** and **D**) where a substance is undergoing a change of state, **which of the following shows the process of deposition?**









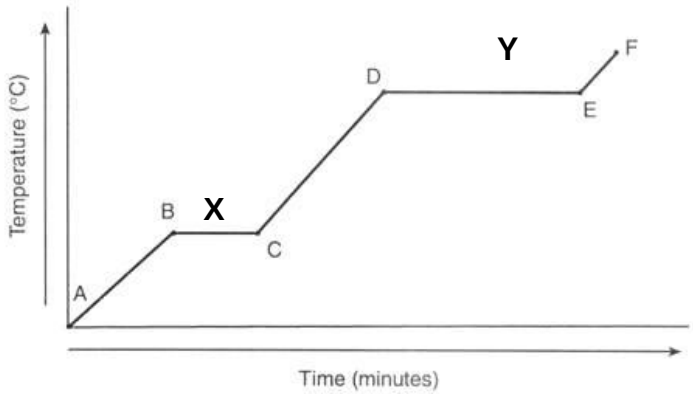
( )

10 (a) Ethanol has a melting point of −114 °C and a boiling point of 78 °C. What state will ethanol be in at the following temperatures?

−150 °C: **Solid**

25 °C: **Liquid**

10 (b) The heating curve of ethanol is shown below. Process **X** occurs between points **B** and **C**, while process **Y** occurs between points **D** and **E**.



(i) Identify processes **X** and **Y**

X: **Melting**

Y: **Boiling**

(ii) Why does the temperature remain constant from **B** to **C**?

Heat energy is absorbed from the surroundings to overcome the strong forces of attraction between particles, allowing them to move further away from each other.

Self-Evaluation: I am able to:	**Yes**	**No**
identify the state of a substance given its melting point and boiling point		
interpret and explain a heating curve		

Questions I still have:_____

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