

Particle theory of matter MS

QUESTION 1

QUESTION

ANSWER

EXTRA INFORMATION

MARKS

a)i)

random distribution of circles in
the box with at least 50 % of
circles touching

random distribution of circles
occupies more than 50 % of the
space

judged by eye

1

1

a)ii)

(large) gaps between particles

(so) easy to push particles closer
(together)

or

forces between particles are
negligible / none

accept particles do not touch

accept particles are spread out

an answer in terms of number of
particles is insufficient

1

b)i)

accept a correct description of
random eg unpredictable or move
around freely or in all directions

they take up all the space is
insufficient

they are spread out is insufficient

they move in straight lines

is insufficient

1

b)ii)

speed also) increases

1

Total marks

6

QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	there are strong forces (of attraction) between the particles in a solid (holding) the particles close together or (holding) the particles in a fixed pattern / positions but in a gas the forces between the particles are negligible so the particles spread out (to fill their container)	accept molecules / atoms for particles throughout accept bonds for forces particles in a solid are less spread out is insufficient accept very small / zero for negligible accept bonds for forces accept particles are not close together gas particles are not in a fixed position is insufficient	1 1 1 1
b)i)	particles are (shown) leaving (the liquid / container)	accept molecules / atoms for particles throughout accept particles are	1

		escaping particles are getting further apart is insufficient	
b)ii)	particles with most energy leave the (surface of the) liquid so the mean / average energy of goes the remaining particles down and the lower the average energy (of the particles) the lower the temperature (of the liquid)	accept molecules / atoms for particles throughout accept speed / velocity for energy throughout accept fastest particles leave the liquid	1 1 1
Total marks			8

QUESTION 3

QUESTION	ANSWER		EXTRA INFORMATION		MARKS
	marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)		Level 3 (5–6 marks)
relevant content.		<p>Considers either solid or gas and describes at least one aspect of the particles.</p> <p>or</p> <p>Considers both solids and gases and describes an aspect of each.</p>	<p>Considers both solids and gases and describes aspects of the particles.</p> <p>or</p> <p>Considers one state and describes aspects of the particles and explains at least one of the properties.</p> <p>or</p> <p>Considers both states and describes an aspect of the particles for both and explains a property for solids or gases</p>		<p>Considers both states of matter and describes the spacing and movement forces between the particles. Explains a property of both solids and gases.</p>

	<p>examples of the points made in the response</p> <p>Solids</p> <ul style="list-style-type: none"> • (particles) close together • (so) no room for particles to move closer (so hard to compress) • vibrate about fixed point • strong forces of attraction (at a distance) • the forces become repulsive if the particles get closer • particles strongly held together/not free to move around (shape is fixed) <p>Gases</p> <ul style="list-style-type: none"> • (particles) far apart • space between particles (so easy to compress) • move randomly • negligible/no forces of attraction • spread out in all directions (to fill the container) 	<p>extra information</p> <p>any explanation of a property must match with the given aspect(s) of the particles.</p>	
Total marks			6