The National Orthodox School Shmaisani

Science Worksheet #1/ Term 2

Changing State

Name: ____**Answer Key**___ Grade **7A**

Date: **/2/2023**

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1 - Changing state and the particle model

Fill in the gaps using the words from the box below. Some words may be used more than once.

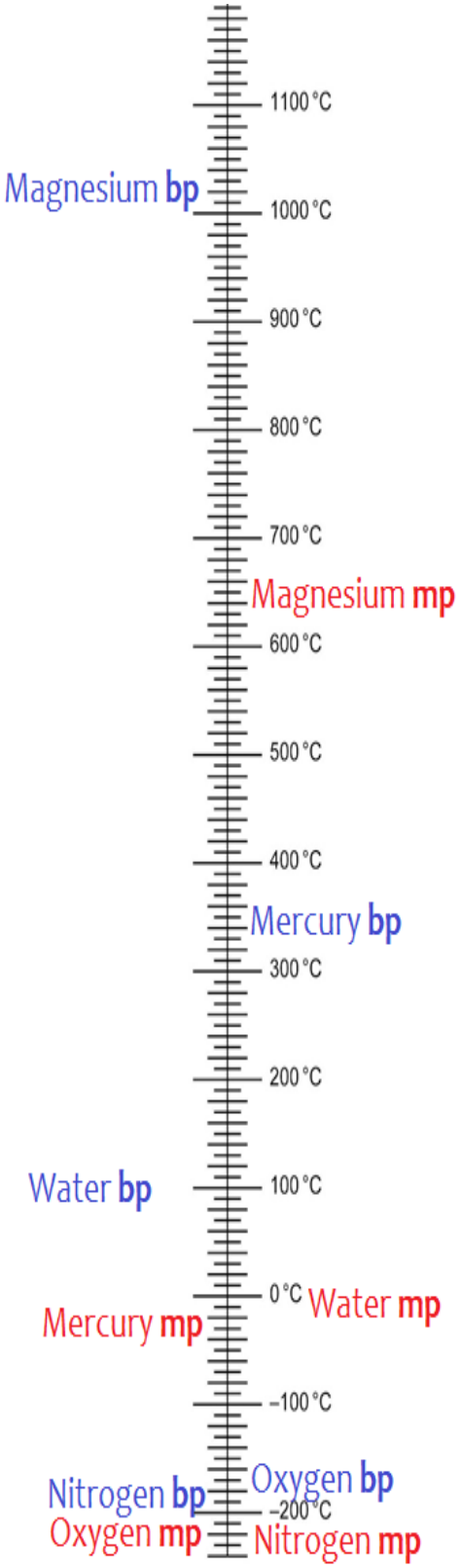
The particles in a solid are close together and _vibrate__ . When they are heated they gain Kinetic energy . This causes the particles to move faster and overcome their _intermolecular __forces____. This is known as __melting_ . The particles are now able to move from their positions slowly; they have become a __liquid_____ . As more energy by heat is given to the particles, they move more _quickly_____ . Eventually they have enough energy to overcome their ____ intermolecular __forces and escape from each other. This is known as ____boiling____ ; the particles have become a __gas__ .

kinetic energy	**intermolecular forces**		**melting**	**boiling**
gas	**close together**	**liquid**	**vibrate**	**quickly**

2 Melting and boiling points

Match the cards on the thermometer scale. Then use the scale to answer the following questions.

Oxygen m.p. = –218 °C	Oxygen b.p. = –183 °C	Mercury b.p. = 357 °C	Nitrogen m.p. = –210 °C
Nitrogen b.p. = –195 °C	Magnesium m.p. = 649 °C	Mercury m.p. = –39 °C	Magnesium b.p. = 1090 °C
Water m.p. = 0 °C	Water b.p. = 100 °C		



a- What state is Mercury at:

400 °C ? _____gas_____

0 °C ? ____liquid___

b- What state is Oxygen at:

-200 °C ? ___liquid_____

-100 °C ? ___gas____

c- What happened to Magnesium between the temperatures 649 °C and 1090 °C?

Magnesium was heated.

At 1090°C it started boiling and changed into gas.

3 Latent heat

Use the thermometer scale prepared on page 2.

a- Which substances are gas at 1000 °C?

___**Mercury / water / Nitrogen / Oxygen**_____

b- Which substances are solid at –100 °C?

____**Magnesium / water/ Mercury**_____

c- Which substances are liquid at 0 °C?

____**Water/ Mercury**_____

Look at the table of data given.

Substance	**Specific latent heat of melting (kJ/kg)**	**Melting point (°C)**	**Specific latent heat of vaporisation (kJ/kg)**	**Boiling point (°C)**
aluminium	397	660	10 900	2519
water	334	0	2501	100

Are the following statements **true** or **false**?

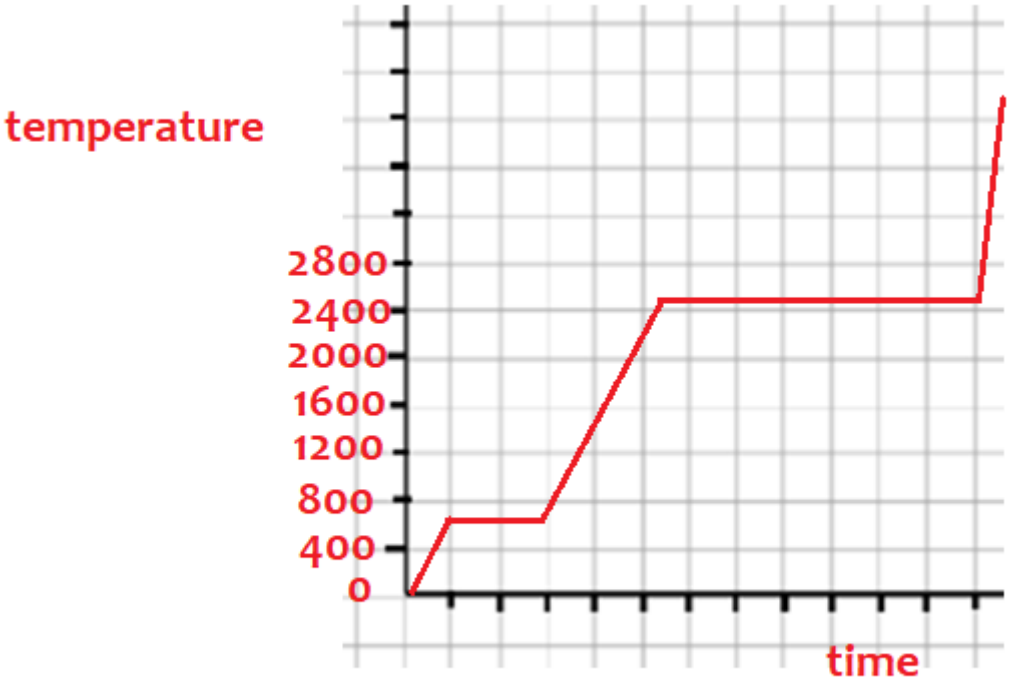
a- Much more energy is needed to change aluminium from a liquid to a gas than to change it from a solid to a liquid. __True

b- The intermolecular forces between aluminium are weaker than those of water. False

c- A similar amount of energy is needed to melt aluminium as is needed to melt ice. True

Draw graph axes: y-axis: temperature (°C), x-axis: time (minutes). Sketch a graph showing the changes of state of aluminium, and one showing the changes of state of water.

Aluminium



Water