

# Revision Sheet #1 | Lower Secondary

## Stage (6-8)

1<sup>st</sup> Semester | 2023-2024

**Subject:** Chemistry

**Chapter 1:** The Particle Model-**Answer Key**

**Objectives:**

- Define evaporation, boiling, condensation, melting, freezing and sublimation.
- Describe how the arrangement, separation and movement of particles change when a substance changes its state.
- Make conclusions from data

**1 – Use the words and phrases to copy and complete the sentences below. You may use each word or phrase once, more than once, or not at all.**

*a little                      close together                      far apart                      gas                      liquid*  
*much                      solid                      vibrate on the spot                      move around from place to place*  
*move around and slide over each other*

Copper exists in three states – solid, liquid and **gas**. In the solid state, its particles ... **vibrate on the spot**. The particles are **close together**. When copper melts, it changes state from **solid** to **liquid**. Its particles start to **move around and slide over each other**. They get **a little** further apart. If copper is heated to 1084°C, it changes from the liquid to the **gas** state. Its particles get **much** further apart and the start to **move around from place to place**.

**2- Choose the correct answer.**

- Which of the following choices is not an example of a change of state?
  - a) A puddle of water drying out
  - b) Table salt dissolving in a pot of warm water**
  - c) Ice melting in a glass of soda
  
- In a research lab a technician placed a pot with water on a gas stove. The technician notices bubbles forming throughout the water. What process caused the bubbles to form?
  - a) Sublimation
  - b) Boiling**
  - c) Evaporation

- A handful of ice cubes were placed on a pan held over a tea pot that was filled with water and set over high heat. Eventually the water comes to a boil and you notice water droplets forming on the pan. What is the correct order of the changes of state involved in this scenario?



- a) Liquid----> sublimation----> gas ---->deposition----> liquid
- b) Liquid----> evaporation----> gas----> deposition----> liquid
- c) Liquid----> evaporation----> gas----> condensation----> liquid

- What happens to the movement of the particles in a substance when the energy is increased?

- a) Speed Up
- b) Slow Down
- c) Stay the same

- When energy is decreased in a gas, what change in state is happening?

- a) Boiling
- b) melting
- c) Condensation

### 3- Describe the arrangement, movement and separation of particles before and after sublimation.

**Arrangement: from a fixed pattern to a random arrangement.**

---

**Movement: from vibrating on the spot to moving fast and freely to every direction.**

---

**Separation: from tightly packed to being far apart**

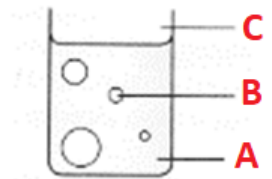
---

### 4- Choose the correct term to complete the following statements.

- A space with no particles in it is called **vacuum** .
- The temperature at which a substance boils is known as its **boiling point**, while the temperature at which the substance melts is called **melting point**.
- The change of state from liquid to solid is **freezing**., and the opposite change of state will be **melting** .

5- Write the letter of each label next to the correct line in the diagram.

- A Water in the liquid state
- B Water in the gas state (steam or vapour)
- C Mixture of air and steam



6- The table gives the melting points and boiling points of five substances.

a- Which substance has the highest melting point?

**tungsten**

b- Which substance has the lowest boiling point?

**chlorine**

c- Name a substance from the table that is in the gas state at 20°C. **chlorine**

d- Name all the substances that are in the solid state at 20°C. **iodine, osmium, tungsten**

e- What is the state of bromine at 20°C? **liquid**

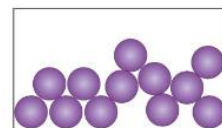
f- **Explain** what happens when bromine is heated from 20°C to 100°C?

**The liquid bromine particles gain energy, so they move faster and gas bubbles form. These bubbles rise to the surface and gas particles escape.**

Substance	Melting point (°C)	Boiling point (°C)
bromine	-7	59
chlorine	-102	-34
iodine	114	184
osmium	3000	5000
tungsten	3422	5555

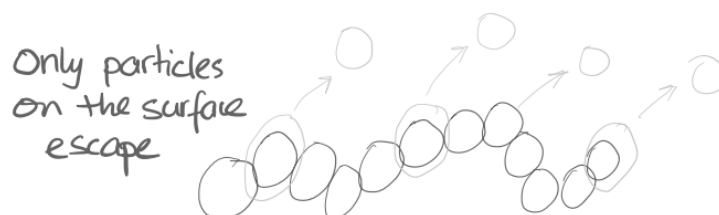
7- The diagram shows the particle of a substance in its liquid state.

a-What can you do to make the particles in the liquid move faster?

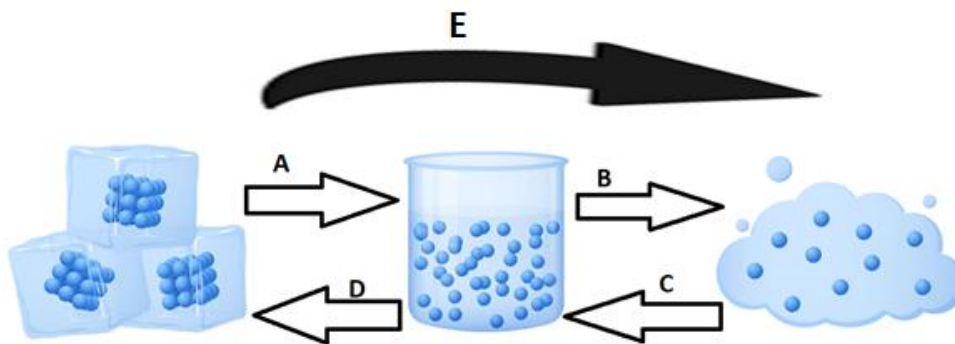


**Heat the particles**

b-Draw a diagram to explain what happens to the liquid when it evaporates.



7- In the diagram below, each arrow represents a change of state.



- Write the letter that shows the following:

Freezing

**D**

Sublimation

**E**

Condensing

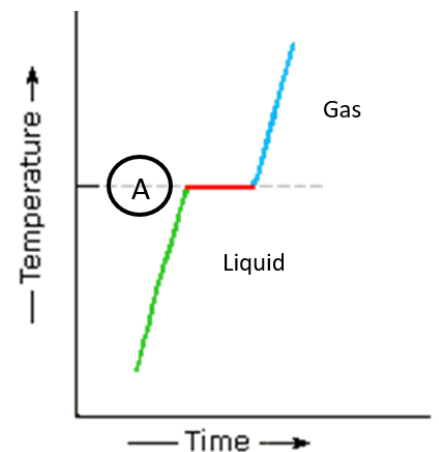
**C**

- Give the letters that show a decrease in energy.
- Give the letters that show an increase in energy.

**C / D**

**A / B / E**

8- The graph shows changes of state of a substance.



- The liquid turns into a gas when it reaches point (A). What is point (A) called?

**The boiling point**

- Explain why the temperature stops rising at point (A).

**All energy gained is used until all liquid particles turn into gas.**

- Explain the process in which liquids turn into gases using the particle theory.

**As the liquid is heated, the particles start moving faster and faster until they have enough energy to escape the liquid and become a gas.**