SELF ASSESSMENT QUESTIONS

Q1: Explain why the measurement of volume of a given liquid remains same although it is measured by measuring cylinders of different shapes and sizes.

Ans The volume of a given liquid remains the same because **volume is the amount of space occupied by the liquid** , and this does not depend on the shape or size of the measuring cylinder.

A liquid has a **definite volume** but no fixed shape. So when it is poured into different measuring cylinders, it changes shape to fit the container, but the **quantity of liquid is unchanged .**

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Q2: What is the difference between evaporation and boiling?

FEATURE	EVAPORATION	BOILING
Occurs at	Any temperature below boiling point	At a specific boiling point
Location	Only at the surface of the liquid	Throughout the liquid
Rate of process	Slow	Fast
Heat requirement	Does not need external heat	Requires heat to reach boiling point
Formation of bubbles	No bubbles form	Bubbles of vapor form throughout liquid
Cooling effect	Causes cooling of liquid	No significant cooling effect

Q3: What is the difference between three states of matter? in terms of the spacing between the molecules.

ANS: **Solid:** Molecules are **very closely packed together** with very little space between them.

Liquid: Molecules are **close together** , but there is **more space between them than in a solid** . They can move/slide past each other.

Gas: Molecules are **far apart** with large spaces between them compared with solids and liquids.

Q4: Why Tungsten melts at a much higher temperature than iron?
ANS:

Tungsten melts at a much higher temperature than iron because the **forces between tungsten atoms are stronger** than those between iron atoms.
To melt a metal, enough heat energy must be supplied to overcome the forces holding its atoms in their solid lattice. Tungsten has **very strong metallic bonding** , so its atoms need much more energy to break free from their fixed positions. on the other hand, has weaker metallic bonds compared to tungsten. Therefore, tungsten has a much higher melting point than iron.

Q5: What is the name of process in which a liquid changes into a solid?
ANS:

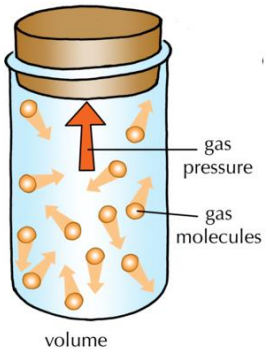
The process in which a liquid changes into a solid is called **freezing** or **solidification** .
Example: Water turning into ice.

Q6: What is the name of temperature at which a liquid changes into a solid?
ANS:

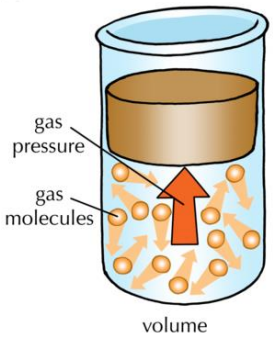
The temperature at which a liquid changes into a solid is called the **freezing point** . It can also be called the **solidification point**
Example: Water freezes at **0 °C**

Q7: Draw diagrams of the molecules in a gas to explain the effect of pressure change on its volume.

1. **Low Pressure (High Volume)**
   - Molecules are far apart.
   - Sketch: Draw a big box with a few dots spread out inside.
   - Label: "Low pressure → molecules have more space → volume is large."



2. **High Pressure (Low Volume)**
   - Molecules are closer together.
   - Sketch: Draw a smaller box with dots crowded together.
   - Label: "High pressure → molecules compressed → volume decreases."



Explanation:

When pressure on a gas is increased, the particles are pushed closer together, so the volume decreases.

When pressure is decreased, the particles can spread out, so the volume increases.

This relationship is described by **Boyle's law** :

$$P \times V = \text{constant}$$

Q8: What is the meant by the subscripts 1 and 2 in the equation, $P_1 V_1 = P_2 V_2$

P_1= initial pressure

V_1= initial volume

P_2= final pressure

V_2= final volume

This is **Boyle's Law** , which relates the pressure and volume of a gas **before and after a change** , assuming temperature is constant.

Q9: What is the effect of temperature on average translational kinetic energy of molecules?

ANS:

The **average translational kinetic energy** of molecules is **directly proportional to the absolute temperature** of the gas

$$(K.E)_{avg} = \frac{3}{2} kT$$

$$(K.E)_{avg} \ \alpha \ T$$

Effect:

- If the **temperature increases** , molecules move faster and their average kinetic energy increases.
- If the **temperature decreases** , molecules move more slowly and their average kinetic energy decreases.