



**BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 110034**

**CLASS- 9**

**CHEMISTRY**

**CHAPTER 1 : MATTER IN OUR SURROUNDINGS**

**Guidelines**

Dear students

- Refer to the content given below and view the links.
- These notes will help you to understand the concept and complete the assignment that follows.
- The assignment is to be done in the Chemistry notebook
- Please read Science NCERT book before you begin to answer the questions.

Link for Class 9 Science NCERT book:

[http://ncertbooks.prashanthellina.com/class\\_9.Science.Science/CHAP%201.pdf](http://ncertbooks.prashanthellina.com/class_9.Science.Science/CHAP%201.pdf)

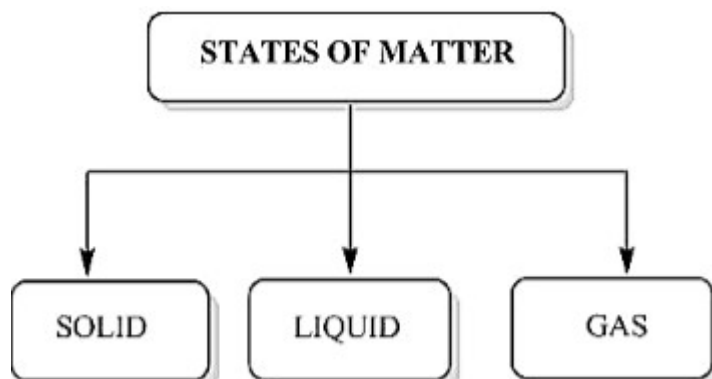
**Sub-Topics**

- States of Matter
- Properties of Solids, Liquids and Gases
- Some important concepts







**States of Matter**

Three different states of matter occur based upon:

- The difference in interparticle forces of attraction
- The arrangement of particles.
- The kinetic energy of particles



## Properties of Solids, Liquids and Gases

Property	Solid	Liquid	Gas
Shape and volume	<p>Fixed shape and volume</p> 	<p>No fixed shape, takes the shape of the container but has fixed volume</p> 	<p>Neither definite shape nor volume</p> 
Molecular Structure			
Arrangement of molecules/particles	Regular and closely arranged	Random and little spaces	Random and large spaces between the particles
Interparticle space	Very less	More	Large
Interparticle forces of attraction	Maximum	Medium	Minimum
Kinetic Energy of particles	Lowest	Medium	Highest
Compressibility	Incompressible	Almost Incompressible	Highly Compressible
Fluidity	Cannot flow	Flows from higher to lower level	Flows in all directions
Density	Maximum	Medium	Minimum

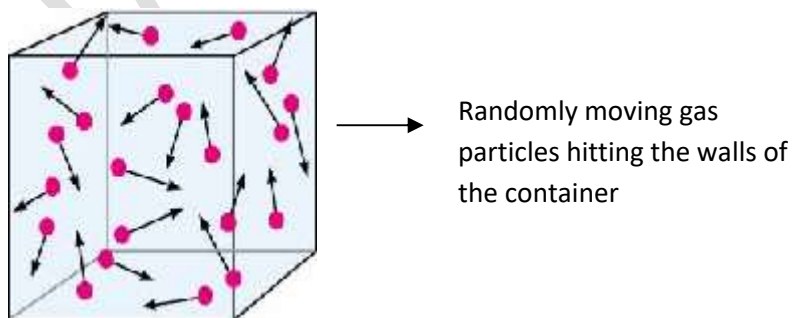
Rate of diffusion	Negligible	It depends on interparticle attraction.	Maximum
-------------------	------------	-----------------------------------------	---------

### Some important concepts:

- **A sponge changes its shape** (only when we apply force on to it). This happens because it **has** tiny pores in which air is trapped. The trapped air is expelled out when these solids are compressed.



- It appears as if salt crystals when poured in any container, **take the shape of container**, but actually each of its grain has its own definite shape.
- **A gas is said to exert pressure on the walls of the container** in which it is stored. The reason behind this is that the particles of gas are continuously moving. During this, they hit the walls of the container and exert force on a given area i.e. exert pressure. (Pressure= Force/Area)



- **A gas fills all the space that is available to it** as the particles of gas have very weak forces of attraction between them and they are continuously moving in all the directions, so it fills the container completely in which it is stored.
- **Gases are supplied in a compressed form.** The interparticle spaces in gases are very high; they can be decreased by applying pressure. Due to high compressibility, a large volume of a gas can be transported in smaller cylinders and transported easily. For example: LPG, CNG etc.

- The increasing order of rate of diffusion in 3 states of matter is:

**Solid < Liquid < Gas**

The rate of diffusion is maximum in gases because the particles of gas are moving at a very high speed and have a lot of space between them.

**Key Terms:**

<b><u>Solid</u></b>	A solid is that form of matter which has fixed shape and volume, is incompressible and rigid.
<b><u>Liquid</u></b>	A liquid is that form of matter which has a definite volume but no definite shape, is almost incompressible and possesses fluidity.
<b><u>Gas</u></b>	A gas is that form of matter which neither has a definite volume nor definite shape, is highly compressible and possesses fluidity.
<b><u>Kinetic Energy</u></b>	Energy possessed by a body due to its motion.
<b><u>Fluidity</u></b>	The tendency to flow.
<b><u>Rigidity</u></b>	The tendency to maintain shape when some force is applied.
<b><u>Diffusion</u></b>	The intermixing of the particles of different states of matter on their own
<b><u>Compressibility</u></b>	The tendency to decrease volume when some outside force is applied

**For further reference, you may refer to the following links:**

- <https://www.youtube.com/watch?v=R-yLUUMviRI>
- <https://www.youtube.com/watch?v=MrTxRn9MNWM>

## ASSIGNMENT QUESTIONS

1. Choose the correct answer from the options given below:

- A. The property to flow is unique to fluids. Which one of the following statements is correct?
- Only gases behave like fluids
  - Gases and solids behave like fluids
  - Gases and liquids behave like fluids
  - Only liquids are fluids
- B. A few substances are arranged in the increasing order according to the "forces of attraction" between their particles. Which one of the following represents the correct arrangement?
- Water, air, wind
  - Air, sugar, oil
  - Oxygen, water, sugar
  - Salt, juice, air
- C. The interparticle force of attraction is minimum in:
- Common salt
  - Water
  - Carbon dioxide gas
  - Sugar crystals

## **ASSERTION – REASON QUESTIONS**

**Note:** Read the assertion -reason statements carefully and mark the correct option out of the following options:

- If both the assertion and the reason are true and reason is correct explanation of the assertion.
- If both the assertion and the reason are true and reason is not the correct explanation of the assertion.
- If assertion is true but reason is false
- If both the assertion and the reason are false

D. **ASSERTION:** Gases exert pressure on the walls of the container.  
**REASON :** Particles of gas are far apart.

E. **ASSERTION:** Solids lack the property of diffusion.  
**REASON :** Particles of solids have negligible kinetic energy.

2. Answer the following questions briefly:

- a) A substance has definite volume but no definite shape. State whether this substance is a solid, a liquid or a gas.
- b) Name the state of matter which can be easily compressed.
- c) Why do gases neither have fixed volume nor a fixed shape?
- d) Explain why diffusion occurs more quickly in gases than in liquids.

3. Give suitable reasons for the following statements:

- a) A sponge is considered as an exceptional solid.
- b) A rubber band can change its shape unlike solids, yet it is considered a solid.
- c) Gases are said to exert pressure on the walls of the container.
- d) Solids have more density than gases.
- e) Gases are supplied in a compressed form.

\*\*\*\*\*

BBPS, PITAMPURIA