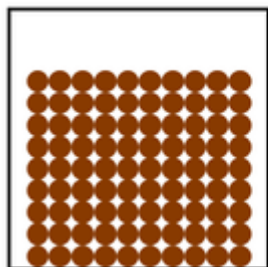
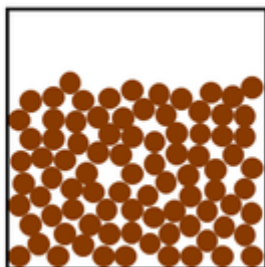


## Chemistry- X- Unit -2. Gas laws

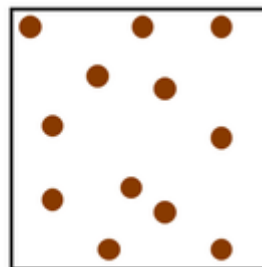
Let us have a look at the arrangement of molecules in solids liquids and gases



Solid



Liquid



Gas

Statements regarding gas molecules are given below

- Energy is very high.
  - Distance between the gas molecules are very high.
  - The movement of gas molecules are very high.
  - The force of attraction between the molecules are very low.
- Properties of gases -Volume, Pressure ,and Temperature

Volume of a gas is the volume of the container which it occupies.

Force exerted per unit area is called pressure.

Temperature is the average kinetic energy of molecules in a substance.

### Some gas laws

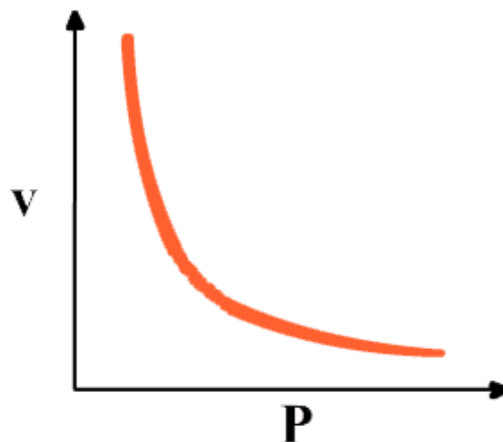
#### Boyle's Law

At a constant temperature, volume of a definite mass of gas is inversely proportional to its pressure. This law is known as Boyle's law

$$P \propto 1/V \quad [ T \text{ Constant } ]$$

$$P = A \text{ constant} \times 1/V$$

$$PV = A \text{ constant}$$



Ex: The size of the air bubbles rising from the bottom of an aquarium increases. This is because of Boyle's law. When they rise up, the pressure decreases. So its volume increases.

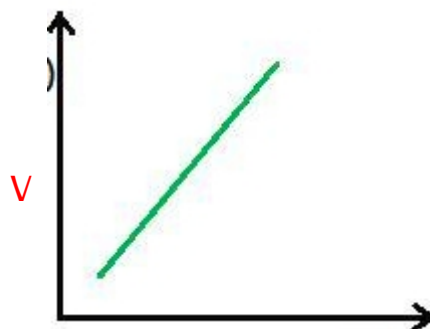
### Charles' law.

At constant pressure, the volume of a definite mass of a gas is directly proportional to the temperature in Kelvin Scale. This law is known as Charles' law.

$$V \propto T \quad [ P \text{ Constant } ]$$

$$V = A \text{ constant} \times T$$

$$V/T = A \text{ constant}$$



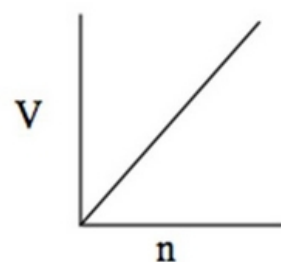
Exp: If an inflated balloon is kept in sunlight for some time, it bursts. This is due to Charles' law.

## Avagadro's Law

T

At constant temperature and pressure, the volume of a gas is directly proportional to the number of molecules.

$$V \propto n \quad [ P, T \text{ Constant } ]$$



### Questions

1. When an inflated balloon is immersed in water, its size decreases. Why ? Explain the law associated with it ?
2. Before opening a bottle with liquid ammonia, it is refrigerated. Why ?
3. Certain data regarding various gases kept under the same conditions of temperature and pressure are given below.

Gas	Volume (L)	Number of Molecules
Nitrogen	10 L	X
Oxygen	5L	....
Ammonia	10L	....
Carbon dioxide	....	2x

- a) Complete the table.
- b) Which gas law is applicable here?

\*\*\*\*\*