SSLC -Chemistry -Class -12

Chapter :2   Gas Laws and Mole Concept

Volume and Temperature

When temperature increases volume also increases at constant pressure.
 This law is known as Charles' law.

Charles' law

At constant pressure, the volume of a definite mass of a gas is directly proportional to the temperature in Kelvin Scale. If V is volume and T the temperature, Then $\dfrac{V}{T}$ will be a constant.

Observe the change in volume on increasing the temperature at constant pressure.

Volume	Temparature	V/T
546 ml	273 K	$\dfrac{546}{273} = 2$
600 ml	300 K	$\dfrac{600}{300} = 2$
640 ml	320 K	$\dfrac{640}{320} = 2$
660 ml	330 K	$\dfrac{660}{330} = 2$

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We can notice that volume is directly proportional to temperature.

V/T is a constant.

If an inflated balloon is kept in sunlight, it will burst. The reason is Charles' law.

Volume and Number of Molecules

Consider tree balloons as shown below.

Observe the number of molecules and volume.

When number of molecules increases volume also increases . Here temperature and pressure kept constant.

This relationship is known as Avagadro's Law

Avagadro's Law

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

Questions

1. Convert 37 ºC in to Kelvin scale .

   (300K, 310K, 37K, 370K   )

2. A balloon is being inflated.
        Explain the gas law associated with it.

3. Certain data regarding various gases kept under the same conditions of temperature and pressure are given below.

Gas	Volume (L)	No. of molecules
Nitrogen	10 L	x
Oxygen	5 L	
Ammonia	10 L	---
Carbon di oxide	---	2x

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

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