TENDER HEART HIGH SCHOOL, SEC-33B, CHD

CLASS - IX SUBJECT - CHEMISTRY

CHAPTER - 7 TEACHER - ANAMIKA

Revision - 1

CH-7 (Study of Gas Laws)

Q1 A gas occupies 800 cm^3 under 760 mm Hg pressure. Find under what pressure the gas will occupy 380 cm^3, the temperature remaining constant.

Sol Sol $P_1 = 760$ mm Hg $V_1 = 800 cm^3$

$P_2 = ?$ mm Hg; $V_2 = 380 cm^3$

By Boyle's law, $P_1V_1 = P_2V_2$

Substituting the values,

$760 \times 800 = P_2 \times 380$

$\therefore P_2 = \frac{760 \times 800}{380} = 1600$

$= 1600$ mm Hg $= 160$ cm Hg

Q2 120 cm^3 of a gas is taken at 27.3 K. The temperature is then raised to 0°C. What is the new volume of the gas? The pressure is kept constant.

Sol :- $V_1 = 120 cm^3$, $T_1 = 27.3$ K ; $V_2 = ? cm^3$

$T_2 = 273$ K, since 0°C = 273 K

By Charle's law

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

Substituting the values,

$$\frac{120}{27.3} = \frac{V_2}{273}$$

$$\therefore V_2 = \frac{120 \times 273}{27.3} = 1200 cm^3$$

Ans:- The gas at 0°C would occupy a volume of 1200 cm^3.

Q3 Pressure of a gas at S.T.P is doubled and the temperature is raised to 546 K. What is the final volume of the gas?

Ans Solution:- $P_1 = 760$ mmHg $P_2 = 2 \times 760$ mmHg
$T_1 = 273K$ $T_2 = 546K$
$V_1 = V_1$ $V_2 = ?$

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

$$\frac{760 \times V_1}{273} = \frac{2 \times 760 \times V_2}{546}$$

Or $$V_2 = \frac{760 \times V_1 \times 546}{2 \times 760 \times 273}$$

$$\therefore V_2 = V_1$$

The Volume of the gas remains the same

(END)