

TENDER HEART HIGH SCHOOL

CLASS - IX
Chapter - 7

Subject - Chemistry
Teacher - Anamika

Revision

Q:-1. A gas occupies 800 cm^3 under 760 mm Hg pressure. Find under what pressure the gas will occupy 380 cm^3 , the temperature remains const.

Soln:-

$$\begin{array}{ll} P_1 = 760 \text{ mm} & V_1 = 800 \text{ cm}^3 \\ P_2 = ? & V_2 = 380 \text{ cm}^3 \end{array}$$

Acc. to Boyle's law

$$P_1 V_1 = P_2 V_2$$

$$760 \times 800 = P_2 \times 380$$

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

$$P_2 = 1600 \text{ mm or } 160 \text{ cm Hg}$$

Q:-2. 120 cm^3 of a gas is taken at 27.3 K . The temp is then raised ~~at~~ to 0°C what is the new vol. of gas? The pressure is kept const.

Soln:-

$$V_1 = 120 \text{ cm}^3 \quad T_2 = 273 \text{ K} \quad V_2 = ?$$
$$T_1 = 273 \text{ K}$$

By Charles' law

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

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

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

Q:3 At what temp will 500 cm^3 of a gas measured at 20°C occupy half its volume if pressure is kept const?

Soln:-

$$V_1 = 500 \text{ cm}^3 \quad T_1 = (273 + 20) = 293 \text{ K}$$
$$V_2 = 250 \text{ cm}^3 \quad T_2 = (273 + t) \text{ K}$$

By Charles' Law

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

$$\frac{500}{293} = \frac{250}{T_2}$$

$$T_2 = \frac{250 \times 293}{500} = 146.5 \text{ K}$$

$$T_2 = 273 + t$$

$$146.5 = \cancel{273} \cdot 273 + t$$

$$t = 146.5 - 273 \\ = -126.5^\circ\text{C}$$

Q4 One litre of gas at 10°C is heated till both its volume & pressure are tripled. Find the new temp. ?

Soln:-

Initial condition

$$P_1 = P$$

$$V_1 = 1\text{L}$$

$$T_1 = (273 + 10) = 283\text{K}$$

final condition

$$P_2 = 3P$$

$$V_2 = 3\text{L}$$

$$T_2 = ?$$

from gas equation

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$\frac{P \times 1}{283} = \frac{3P \times 3}{T_2}$$

$$T_2 = \frac{3P \times 3 \times 283}{P \times 1}$$

$$8547\text{K or } 2274^\circ\text{C}$$