6.5.24

TENDER HEART HIGH SCHOOL, SEC-33B, CHD

CLASS- IX — SUBJECT-CHEMISTRY

CHAPTER-7 — TEACHER-MOHINISHA THAKUR

Numericals

(Gases) Pg No-119

1. Sol: Initial volume (V_1) = 80 mL
Initial pressure (P_1) = 100 cm Hg at 25°C.
final volume (V_2) = 160 mL
(P_2) = ?

Acc to Boyle's law, temperature remains constant

$$P_1V_1 = P_2V_2$$

$$P_2 = \frac{P_1V_1}{V_2} = \frac{100 \times 80}{160} = 50 \text{ cm Hg Ans.}$$

2. Sol $V_1 = 74 cm^3$, $V_2 = ?$
$P_1 = 760 mm$ $P_2 = 740 mm$

Acc to Boyle's law at constant temperature

$$P_1V_1 = P_2V_2 \Rightarrow \frac{P_1V_1}{P_2} = V_2 \Rightarrow V_2 = \frac{760 \times 74}{740}$$

$$V_2 = 76 cm^3 \text{ Ans}$$

3. Acc to Boyle's law $P_1V_1 = P_2V_2$
$P_1 = 100 cm$ of Hg $V_1 = 80 cm^3$
$P_2 = 125 cm$ of Hg
→ At constant temperature

$$P_1V_1 = P_2V_2 \Rightarrow V_2 = \frac{P_1V_1}{P_2} = \frac{100 \times 80}{125} = 64 cm^3$$

$V_2 = 64 cm^3 = x$

Similarly for calculate the value of (y)

Ac: $P_3 = 200 cm$ of Hg $V_3 = 40 cm^3$
$P_4 = ?$ $V_4 = 32 cm^3$

Acc to boyle's law at constant temperature

$$P_3V_3 = P_4V_4 = \frac{P_3V_3}{V_4} = P_4 = \frac{200 \times 40}{32} = 250 mm \text{ Hg}$$

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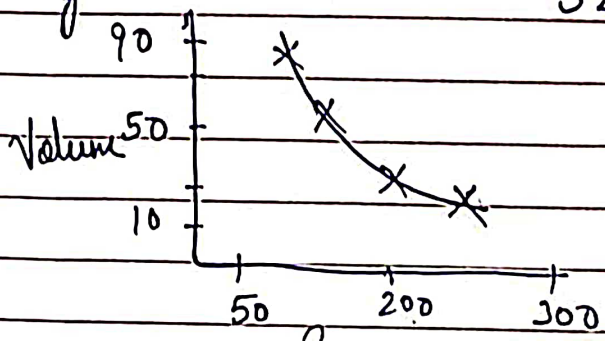
(i) Volume plotted against pressure

Pressure	Volume
100	80
125	64
200	40
y	32



4 Sol $V_1 = 400cm^3$ $V_2 = ?$

$P_1 = 760mmHg$ $P_2 = 760 + \frac{760 \times 25}{100}$

$P_2 = 760 + 190 = 950\ mmHg$

Acc to Boyle's law at constant temperature

$P_1V_1 = P_2V_2$

$\frac{P_1V_1}{P_2} = V_2 \Rightarrow V_2 = \frac{760 \times 400}{950}$

$V_2 = 320cm^3$

5 $V_1 = 600cm^3$ $V_2 = 600 + 300 = 900cm^3$

$P_1 = 304cm\ of\ Hg$ $P_2 = ?$

$P_1V_1 = P_2V_2 \Rightarrow P_2 = \frac{V_1P_1}{V_2} \Rightarrow P_2 = \frac{600 \times 304}{900}$

$= 202.67cm\ of\ Hg$

6 $P_1 = 1080\ mm\ Hg$ $P_2 = ?$

$V_1 = V$ $V_2 = V - \frac{40 \times V}{100} = 0.6V$

Date

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Acc to Boyle's law at constant temperature

$P_1V_1 = P_2V_2$

$\frac{P_1V_1}{V_2} = P_2 \Rightarrow \frac{1080 \times V}{0.6V} = P_2$

$\frac{10800}{6} = P_2$

$P_2 1800 \text{ mmHg}$ Ans