86.(C) As we move away from the origin in a P-V curve for Boyle's law, T increases for the isotherms.

87.(C) Mass of the gas = $50.5 - 50 = 0.5\,\text{gm}$;

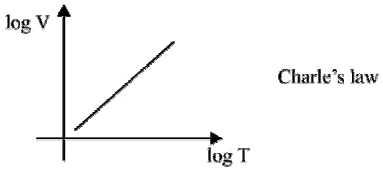
mass of liquid $= 148 - 50 = 98\,\text{gm} = 0.98\,V_{ml} \quad \Rightarrow \quad V_{mL} = 100\,\text{mL}$

Use : PV = nRT $\quad \Rightarrow \quad 1 \times 0.1 = \dfrac{0.5}{M_0} \times 0.082 \times 300 \quad \Rightarrow \quad M_0 = 123\,\text{gm}$

88.(B) $\dfrac{r_X}{r_{H_2}} = \dfrac{1}{3\sqrt{3}} \sqrt{\dfrac{m_{H_2}}{M_X}} \quad \Rightarrow \quad M_X = 54\,\text{gm} = 12n + (2n - 2) \quad \Rightarrow \quad 14n = 56 \quad \Rightarrow \quad n = 4$

89.(AC) V = (const.) T = kT

$\Rightarrow \quad \log V = \log T + \log k \quad \Rightarrow$



Charle's law

90.(A) $P_i = P_f$

$\Rightarrow \quad \dfrac{10RT}{V_i} = \dfrac{9RT}{V_f} \quad \Rightarrow \quad V_f = \dfrac{9V_i}{10}$

$P_{O_{2i}} = \dfrac{3RT}{V_i}$ and $P_{O_{2f}} = \dfrac{2RT}{V_f} \quad \Rightarrow \quad \dfrac{P_{O_{2i}} - P_{O_{2f}}}{P_{O_{2i}}} = \dfrac{3 - \frac{20}{9}}{3} = 26\%$

91.(A) $Z = \dfrac{(PV)_{real}}{(PV)_{ideal}}$

$\therefore$ For positive deviation, $Z > 1$

Or $(PV)_{real} > (PV)_{ideal}$

92.(A) $\left[\dfrac{3}{2}nRT\right]_{He} = \dfrac{3}{2}nRT$

$0.3T = 0.4 \times 400 \quad \Rightarrow \quad T = 533\,\text{K}$

93.(B) Case I – Suppose inner balloon bursts first

$\dfrac{600}{300} = \dfrac{800}{T_2} \Rightarrow T_2 = 400\,\text{K}$

Case II – Suppose outer balloon bursts first

$\dfrac{1500}{300} = \dfrac{1800}{T_2}$; $T_2 = 360\,\text{K}$

94.(C) PV = nRT $\quad \Rightarrow \quad \dfrac{P}{3} \times 2V = nRT \quad \Rightarrow \quad T = \dfrac{2}{3}T$

95.(C) From the total pressure and the vapour pressure of water we can calculate the partial pressure of O_2.

$P_{O_2} = P_T - P_{H_2O} = 760 - 22.4 = 737.6$ mm Hg

From the ideal gas equation we write

$m = \dfrac{PVM}{RT} = \dfrac{(0.974\,\text{atm})(0.128\,\text{L})(32.0\,\text{g/mol})}{(0.0821\,\text{L atm/K mol})(273 + 24)\,\text{K}} = 0.163\,\text{g}$