$P_{T} = 0.04538\ \text{atm}$

$$0.04538\ \cancel{\text{atm}}\left(\frac{760\ \text{torr}}{1\ \cancel{\text{atm}}}\right)$$

$$= 34.5\ \text{torr}$$

A 3.06 g sample of a protein was dissolved in enough water to produce 35.9 mL of solution. The solution was found to have an osmotic pressure of 26.3 torr at 25°C. What is the molecular weight of the protein?

$$MWT = \frac{\#\,g}{\#\,mol} = \frac{3.06\,g}{5.0777\times10^{-5}\,mol}$$

$$= 6.03\times10^{4}\,\frac{g}{mol}$$

$$M = \frac{\#\,mol}{\#\,L} \longrightarrow \#\,mol = M\cdot\#\,L$$

$$\#\,mol = M\cdot(0.0359\,L)$$

$$= (0.0014144\,\tfrac{mol}{L})(0.0359\,L)$$

$$= 5.0777\times10^{-5}\,mol$$

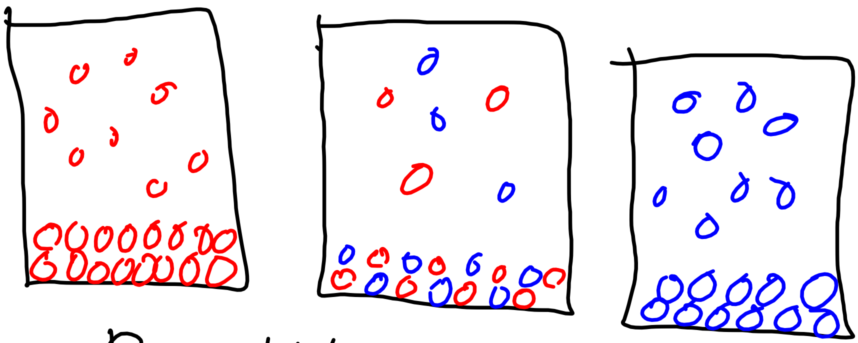
$$\Pi = M\cdot R\cdot T$$

$$\downarrow$$

$$M = \frac{\Pi}{RT} = \frac{0.034605\,atm}{(0.08206\,\frac{L\,atm}{K\,mol})(298\,K)}$$

$$= 0.0014144\,\frac{mol}{L}$$

$$26.3\,torr\left(\frac{1\,atm}{760\,torr}\right) = 0.034605\,atm$$



Raoult's Law

○ A
○ B

$$P_A = X_A \cdot P_A^\circ$$

$$P_B = X_B \cdot P_B^\circ$$

$$P_T = P_A + P_B$$

$$= X_A \cdot P_A^\circ + X_B \cdot P_B^\circ$$

$$X_A + X_B = 1$$

$$\downarrow$$

$$X_A = 1 - X_B$$

$$P_T = (1 - X_B) \cdot P_A^\circ + X_B \cdot P_B^\circ$$