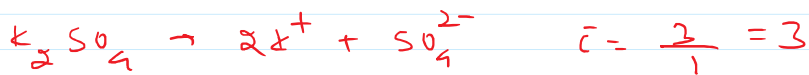
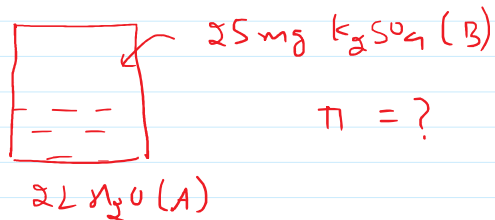


## Question

Determine the osmotic pressure of a solution prepared by dissolving 25 mg of  $K_2SO_4$  in 2L of water at 25°C, assuming that it is completely dissociated.

## Answer



$$M_{K_2SO_4} = 2 \times 39 + 1 \times 32 + 4 \times 16 = 174 \text{ g}$$

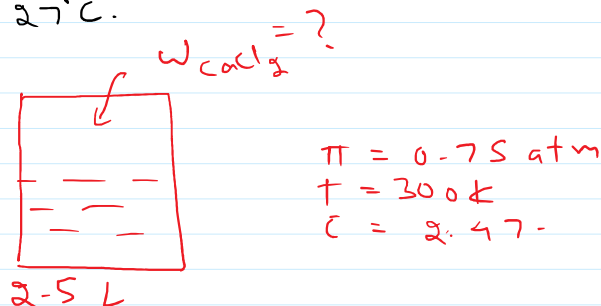
$$C_{K_2SO_4} = \frac{w_{K_2SO_4}}{M_{K_2SO_4} \times V(\text{in L})} = \frac{25 \times 10^{-3}}{174 \times 2} = 7.184 \times 10^{-5}$$

$$\begin{aligned} \pi &= iCRT = 3 \times 7.184 \times 10^{-5} \times 0.0821 \times 298 \\ &= 0.00527 \text{ atm.} \end{aligned}$$

## Question

Determine the amount of  $CaCl_2$  ( $i = 2.47$ ) dissolved in 2.5 L of water such that its osmotic pressure is 0.75 atm at 27°C.

## Answer



$$\pi = iCRT$$

$$0.75 = 2.47 \times \frac{n_{CaCl_2}}{2.5} \times 0.0821 \times 300$$

$$n_{CaCl_2} = 0.03082 \text{ moles}$$

2-5

$$n_{\text{CaCl}_2} = 0.03082 \text{ moles}$$

$$W_{\text{CaCl}_2} = n_{\text{CaCl}_2} \times M_{\text{CaCl}_2} = 0.03082 \times 111 = 3.42 \text{ g}$$