

Problem 13-22 Osmotic pressure

The total concentration of dissolved particles inside the red blood cells is approximately 0.3 mol dm^{-3} . Their walls are a semipermeable membrane. What would be the osmotic pressure inside the cells at the temperature of 298 K if we take them out of the blood plasma and put them in the pure water? What would happen to the cell?

[$\pi = 743.3 \text{ kPa}$, water will penetrate into the cells]

Solution:

$$\pi = c_2 \cdot RT = 0.3 \cdot 8.314 \cdot 298 = 743.3 \text{ kPa}$$

Water will penetrate into the cells and in the end they burst.

